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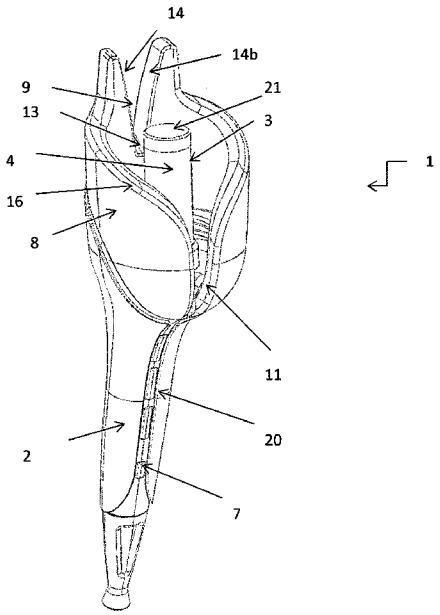

Fig. 1

(57) Abstract: The present invention relates to a hair curling device comprising: a handle; a bar of elongated shape arranged vertically and supported by said handle, said bar having an outer surface to curl the hair; a rotating element that rotates around said bar to wrap the hair around it; a motor for driving said rotatable element; a heating element adapted to heat said outer surface of the bar; a body spaced from said bar and arranged substantially all around it; characterized in that said body is provided with a first opening for inserting inside the device a hair strand to curl, and in that a fixed resting element to lock said hair strand during curling is present at said first opening. The device is easy to use, economical and such as to prevent the formation of knots in the vicinity of the hair root.

WO 2016/134844 A1

Curling hair device

DESCRIPTION

Technical Field

The present invention relates to a hair curling device. In particular, the present invention relates to an automatic a hair curling device.

Background of the invention

Devices which allow users to curl their hair, either in a salon or in a home environment are known in the art. These devices, generally known as hair curling devices, generally comprise a cylindrical heated element protruding from a handle.

However, the heat generated from these devices can damage the user hair and a further damage may be caused by the hair lock and their twist during the stylization process.

In addition, when using a hair curling device, only small hair sections are allowed to be curled for each individual application. In order to stylize the whole mass of hair, it s necessary to repeatedly use the device on individual hair sections, and that action can be time consuming.

The international patent application published as WO 2012/80751-A2 describes a stylization apparatus having a body which defines a chamber for housing a hair strand which has a main opening for allowing the passage of the hair strand inside the chamber. An elongated element is positioned inside the chamber around which the hair strand wraps by means of a rotatable element. The apparatus is further provided with a closure element adapted to close the main opening during the hair stylization inside the chamber. The apparatus is also provided with a secondary opening through which the hair strand exits the chamber once it has been stylized, and with a device that is movable from a first closed position which allows the hair strand to be locked within the chamber to a second position in which the hair strand can exit the chamber through said secondary opening, allowing the hair strand to wrap around the elongate element.

Such a stylization apparatus is so structured that, during its use, it is held by the user in a substantially horizontal position, with the hair strand to be curled that is disposed substantially parallel to the elongate element and with the movable device located in close proximity of the user scalp, where, when it is in the closed position, locks the hair strand towards the hair root.

Therefore, as it is structured, such stylization apparatus has the disadvantage that in the proximity of the hair root, in contact with the user scalp, the hair strand tends to be stapled by the apparatus during use and to twist on itself, creating an unwanted thickening effect and hair tangling close to the hair root.

Furthermore, another disadvantage of this apparatus is that it is realized in a complex manner, being necessary the presence of such a movable device to lock/release the hair strand and of a suitable device able to control the displacement from a position to another one of such a movable device.

The international patent application published as WO 2014/201424A1 describes a hair curling device provided with: a handle, a heatable and substantially cylindrical elongated bar supported by the handle, so as to provide a surface for hair curling, an element for heating said curling surface, a rotatable element with respect to such a surface to wrap the hair around the surface of the bar, an opening in the rotatable element to receive the hair, and a motor for the rotation of the rotatable element. Such a device further comprises at least one flexible, heat-resistant strap, supported by the support extending towards the curling hair surface to block therein the hair to be curled. Such a device further contains an immobilization device, constituted by a flexible and heat resistant arm, supported by the support and radially extending from the support towards the hair curling surface. Such an arm is disposed in a position opposite to said opening and is able to move vertically, but it is restrained from moving horizontally thanks to the insertion in a recess. This vertical movement allows the hair to slip out from the distal end of the bar after they have been stylized, while horizontal movement

limitation allows the arm to prevent the hair twisting while they wrap around the bar.

Such a device, as affirmed by the Applicant of such a patent application, enables an automatic stylization able to quickly produce curls of the same shape and consistent one each other, without requiring a particular experience in the use of the hair curling device, with a reduced probability that the hair tangle.

However, such a device has the disadvantage to be quite complex in its implementation, since it requires the presence of such bands and of such arms, to allow, first, the lock of the hair strand in a determined position to perform the stylization and, thereafter, such a hair strand to be released from such a lock, once the stylization is ended.

Therefore, the Applicant of the present invention has noticed the need to provide a device which is of simple and economical to produce, practical to use, and which solves the technical problem concerning the undesired formation of hair knotting in proximity of the hair root.

Summary of the Invention

In a first aspect, the present invention relates to a hair curling device as the one indicated in claim 1.

The Applicant of the present application has in fact surprisingly found that a hair curling device comprising:

- a handle;
- a bar having an arranged vertically elongated shape and being supported by said handle, said bar having a curling hair outer surface;
- a rotatable element rotating around said bar to wrap the hair around it;
- a motor for driving said rotatable element;
- a heating element adapted to heat said outer surface of the bar;
- a body spaced from said bar and arranged substantially all around it;

characterized in that said body is provided with a first opening for inserting a hair strand to be curled inside the device and in that a fixed resting element to lock said hair strand during curling is provided at said first opening,

is able to provide a device easy to use, economical and able to prevent the formation of knots in the proximity of the hair root.

In fact, the device of the present invention, being provided with such a fixed resting element, instead to be movable as known in the art, is structured in a simpler way, neither having need of any device that control the movement of said movable element from a first position wherein the hair strand is locked to be curled to a second position wherein the hair strand is released after being curled, nor of such bands and arms described in the known in the art documents to lock and release the hair strand.

Furthermore, the device of the present invention, thanks to the fact of being provided with said first opening formed in said device body, allows the insertion within the device of the hair strand to be curled so that the hair strand is in a position substantially perpendicular to said bar, or in other terms, in a horizontal position with respect to the vertical position assumed by the bar itself.

In this way, the hair strand torsion effect at the hair root is eliminated, with the consequent elimination of the unwanted formation of hair knots or hair thickening close to the hair root, which on the contrary occurs by using the known in the art devices, where, in the absence of said first opening formed in said body positioned around the bar, the hair strand is inserted into the device body from the top and it is therefore forced to arrange substantially parallel to the bar, therefore being clamped at the hair root where the movable support element locks the hair strand which consequently wraps on itself.

Furthermore, the device of the present invention has the advantage, being developed in the vertical direction, to be ergonomically designed for a correct use on both sides, right and left, of the user scalp.

In this way, before starting the curling action of a hair strand, the portion of such a hair strand closest to the user scalp is prepared for the subsequent curling, being fixed to said fixed resting support, making it pass through said first opening, and bringing it close to a side of the bar provided with an outer surface for hair curling. Once activated the motor, the rotatable element rotates around the bar onto which the hair strand is wrapped, being then subjected to curling. When the whole hair strand has been subjected to curling, the user will then scroll vertically down the device thus applying a minimum force allowing the hair strand to be free released from the lock exerted on it by said fixed resting support.

Preferably, said first opening comprises a guide to facilitate the passage of the hair strand within the body before its curling, wherein said guide comprises two elements of elongated shape for conveying the hair strand having a profile such that the distance between the two elements gradually decreases going from one end to the opposed one of said elements.

In this way, the hair strand is routed along the walls of the two elements of the guide for conveying the hair until it is positioned in correspondence of the bottom point of the guide, wherein the distance between the two elements for conveying the hair is minimal.

Preferably, said fixed resting element is a notch positioned at the lower portion of said guide, where the distance between the two elements for conveying the hair strand is minimal, for locking said hair strand against said body during hair curling. More preferably, said fixed resting element is a notch provided with a groove, or with a similar fastener.

In this way, the hair strand is locked in the groove of said notch.

Such a fixed resting element thus appears to be fixed to the device body and is not able to move or to be moved from its fixed position.

Preferably, said fixed resting element is further provided with silicone or other similar material elements such as to make more delicate the hair strand locking to

it during the hair curling step, so as not to damage the hair at the point where it is locked.

Said lower portion of said guide is positioned where said fixed resting element can have a more or less wide base section according to the width of the hair strand to be curled that is intended to be passed inside said device body of the present invention.

In a first embodiment, the hair curling device of the present invention is provided with a fixed resting element having a relatively narrow base section, positioned where said two elements of the guide for conveying the hair strand tend almost to touch one each other at the bottom of the guide, thus forming a very tight acute angle.

In such a case, the hair strand that is curled will be very thin, i.e. constituted by a relatively low number of hairs; in order to complete the hair curling step for the whole hair, it will then be necessary to submit a considerable number of such hair strands to the hair curling step.

In a second embodiment, the hair curling device of the present invention is provided with said fixed resting member having a wider base section, determined by a less tight angle of said elements of the guide for conveying the hair strand.

In such a case, the curled hair strand will be more substantial, that means it will be constituted by a greater number of hairs compared to the first embodiment, in this case requiring less time to complete the hair curling step for the whole hair.

Preferably, in order to avoid to carry out a series of hair curling devices of the present invention depending on the consistency of the hair strand to be curled varying from time to time, the device of the present invention may be further provided with one or more adapters for the fixed resting elements, each adapter being of such dimensions as to be able to fit itself to the space formed in the guide between the two elements for conveying the hair strand and able to be fastened between them in a removable manner so as to cover the underlying fixed resting element, each one of said adapters being further supplied in turn with a fixed

resting element having a base section different from the other adapters, so that the user can select the more appropriate adapter to be applied in a removable manner at the first opening of the device body, according to the desired consistency of the hair strand to be curled.

Preferably, the distance X between said fixed resting element and said bar is between 0 and 100 mm, preferably between 0.1 and 50 mm, more preferably between 0.1 and 30 mm.

In this way, the dead zone present in the device of the present invention wherein the hair strand is not curled is minimized. The smaller the distance, the smaller the portion of the hair strand that is not curled, thus allowing even shorter hair to be curled and providing curled hair having an excellent aesthetic effect also at the hair root.

Preferably, said bar of the device of the present invention may be interchangeable an replaced by other similar bars having different sections.

In this way, it is possible to obtain different types of curls.

Preferably said bar may have large or small cylindrical, triangular, square, rectangular, or hexagonal sections.

Preferably, said interchangeable bar is inserted in the handle by a lock/unlock device, for example a bayonet-type device, and are provided with electrical terminals for interconnecting the heating element and the temperature sensor placed inside the bar.

Preferably, said body is provided with a second opening for let exit from the device the free end portion of said hair strand, i.e. the portion of the hair strand farthest from the user scalp.

Preferably, said second opening is positioned on the opposite side of said first opening with respect to the bar.

In this way the exit from the device body of said end portion of the hair strand is facilitated.

Preferably, said second opening is positioned at a lower height of the device body with respect to said first opening.

In this way, the exit from the device body of said end portion of the hair strand is further facilitated; in fact, the end portion of the hair strand descends by gravity from the first opening towards the bar to be curled and from here towards the second opening.

Preferably, said body is constituted by a wall having a substantially circular or elliptical shape such as to define a space between said wall and said bar.

In this way, the bar appears to be positioned substantially at the centre of that space which has been created all around it, delimited by said wall.

Preferably, said wall of said body is substantially continuous, interrupted only at said openings for the passage of the hair strand.

Preferably, at least a portion of said wall of the body is transparent.

In this way, being the wall of the body at least in part transparent, the user has the possibility to see inside the device body, in order to check the proper wrapping of the hair strand around the bar.

Preferably, said wall of said body has a height substantially equal to the height of the bar, except in the points at said first and second openings.

In this way, the wall performs a protection for the hair strand, avoiding them to come in contact with external bodies during the hair curling step.

Furthermore, the wall also prevent the user to accidentally come in contact with the heated bar during the use of the device, thereby avoiding burns.

Preferably, the inner portion of said wall of the device body, the one turned towards the bar, is substantially smooth and rounded, and therefore free of sharp elements or protuberances.

In this way, the smooth inside of said wall prevents the hair strand from becoming entangled during the hair curling step.

Preferably, said bar is provided on its upper portion of a protective cap made of a material which does not conduct heat.

In this way, the user is further safeguarded from possible accidental contact with the heated bar during the hair curling step.

Preferably, said protective cap is of such dimensions as to exceed in height the upper portion of the wall of said body disposed around said bar.

In this way, the user can act even more safely during the steps of positioning the hair strand inside the device in order to curl the hair strand and its passage through said first and second openings, without worrying about any burns caused by accidental contact with the heated bar.

Preferably, said rotatable element is disposed horizontally at the base of the bar so that the rotation axis around which said rotatable element rotates is substantially parallel to the longitudinal direction of said vertical bar.

Preferably, said rotatable element is provided with a gear positioned below the rotating element itself.

In one embodiment, said motor is arranged vertically, so that the rotation axis around which said motor rotates is substantially parallel to said rotation axis around which said rotatable element rotates.

In such an embodiment, said motor is provided with a motor gear which engages in an integral manner with said gear of the rotatable element. Preferably, the gear of the rotatable element is positioned below the rotatable element itself and the motor gear is positioned so as to stand over the motor.

In this way, the motor, once actuated, activates the motor gear that in turn activates the gear of the rotatable element that activates the rotation of the rotatable element itself around the bar.

In an alternative embodiment, said motor is arranged horizontally, so that the rotation axis around which said motor rotates is substantially perpendicular to said rotation axis around which said rotatable element rotates.

In such an alternative embodiment, said motor is provided with a worm screw which engages in an integral manner with the gear of the rotatable element.

Preferably, the gear of the rotatable element is positioned below the rotatable element itself and the worm screw is positioned laterally to the motor.

In this way, the motor, once actuated, activates the worm screw that in turn activates the gear of the rotatable element that activates the rotation of the rotatable element itself around the bar.

Preferably, a magnet is positioned onto said rotatable element.

In this way, during the rotation of the rotatable element, the magnet rotates as well.

Preferably, a sensor is positioned in the body at said rotatable element.

In this way, the sensor is able to detect the magnetic field generated by the magnet when the sensor faces the magnet.

Preferably, said magnet and said sensor cooperate in order to provide a reference position for the rotatable element, so that the rotatable element assumes a suitable position before the hair curling step starts which is suitable for the insertion of the hair strand in an opening and then to count the number of revolutions effected by the rotatable element during the hair curling step.

Preferably, said heating element is positioned inside said bar in thermal contact with said outer surface of the bar.

Preferably, said heating element is a PTC, actuated by a component of an electronic board and coupled to a temperature sensor of the NTC type.

Preferably, an electronic board for managing the functioning of device is positioned within said handle.

In this way, through the electronic board, it is possible to manage the temperature control of the heating element, the clockwise or anti-clockwise movement of the rotatable element, activated by the user via a button placed in the handle and the setting time of the hair strand around the bar for the curl formation.

Further characteristics and advantages of the present invention will become more apparent from an examination of the following detailed description of preferred embodiments, but not exclusive, illustrated only by way of example and not

limitative, with the support of the accompanying drawings. In particular, in the drawings:

- Figure 1 is a perspective view of a first embodiment of a hair curling device according to the present invention;
- Figure 2 is a perspective view that shows an enlarged detail of the device shown in Figure 1;
- Figure 3 is a cut-away perspective view of a detail of the device shown in Figure 1, wherein some elements have been removed for clarity;
- Figure 4 is a view showing a detail of the interior of the device shown in Figure 1, wherein the motor according to a preferred embodiment is visible;
- Figure 5 is a view showing a detail of the interior of the device shown in Figure 1, wherein the motor according to an alternative embodiment is visible;
- Figure 6 is a schematic perspective view of the device of Figure 1 during the use by a user;
- Figure 7 is another schematic perspective view of the device of Figure 1 during the use by a user;
- Figure 8 is a perspective view of a second preferred embodiment of a hair curling device according to the present invention.
- Figure 9 is a perspective view of a detail of a hair curling device according to the present invention;
- Figure 10 is a perspective view of some constructive forms of interchangeable bars used in a hair curling device according to the present invention.

Detailed Description

The following detailed description refers to particular embodiments of the hair curling device of the present invention, without limiting its content.

With reference to Figures 1-7 a first embodiment of such a hair curling device 1 is described wherein, among the various elements which form the device, a handle 2, a bar 3 of elongated shape vertically arranged and supported by the handle 2, and a body 8 spaced from the bar 3 and substantially arranged all around it are visible.

The bar 3 (best seen in its entirety in Figures 2 and 3) has a substantially cylindrical shape and has a smooth outer surface 4 onto which, during use of the device 1, the to be curled hair 10 are wrapped; such smooth outer surface 4 of the bar 3 is heated by means of a heating element (not shown in the figures), positioned inside the bar 3 itself. On the top of the bar 3 is arranged a protective cap 21 made of material that does not conduct heat, so as to prevent burning to the user of the device 1 when he accidentally comes in contact with the heated bar. The protection cap 21 has a smaller height than the top portion of the body 8, disposed around the bar 3, in correspondence of the first opening 9.

The body 8 comprises a wall 16 having a substantially circular or elliptical shape as to define a space 17 between the wall 16 and the bar 3; thus, the bar 3 appears to be positioned substantially at the centre of that space 17 that is created all around it, delimited by the wall 16. The wall 16 of the body 8 has a height substantially equal to the height of the bar 3. Thus, the wall 16 protects the hair strand 10, avoiding that it comes in contact with external bodies during the hair curling step. Moreover, the wall 16 also prevents the user to accidentally come into contact with the heated bar 3 during the use of the device 1, thereby avoiding burns. The inner part of the wall 16 of the body 8, the one turned towards the bar 3, has a substantially smooth and rounded shape, and therefore free of sharp elements or protuberances, so as to prevent the hair strand to entangle during the hair curling step. Such a wall 16 of the body is made of plastic, and at least a portion of it is transparent thus allowing the user to check inside the body 8 for the correct wrapping of the hair strand 10 around the bar 3.

The body 8 is also provided with a first opening 9 in the wall 16 for inserting inside the device 1 a to be curled hair strand 10 and with a second opening 11 for let exit from the device 1 the free end portion 12 of such hair strand 10, i.e. the farthest portion of the hair strand away from the user scalp 15. The wall 16 of the body 8 thus appears to have a substantially continuous profile, interrupted only at

said first opening 9 and at second opening 11 for allowing the hair strand passage through them.

The first opening 9 is positioned on that side of the device 1 which, during use, will be positioned against the user scalp 15, while the second opening 11 is positioned on the opposite side of the first opening 9 with respect to the bar 3; thus, the second opening 11 is positioned on that part of the device 1 which, during use, will be positioned on the opposite side of the user scalp 15. In addition, the second opening 11 is positioned at a lower height of the body 8 of the device 1 with respect to the first opening 9 to further facilitate the exit of the end portion of the hair strand from the body 8 of the device which, by gravity, descends from the first opening 9 towards the bar 3 to be curled, and from there towards the second opening 11.

The first opening 9 comprises a guide 14 to facilitate the passage of the hair strand 10 within the body 8 before he hair curling step starts, the guide 14 being constituted by two elements 14a, 14b of elongated shape having a profile such that the distance between the two elements 14a, 14b gradually decreases going from end towards the opposite one of the elements 14a, 14b, from top towards bottom. On the bottom of the guide 14, at the narrowest point between the two elements 14a, 14b, a fixed resting element 13, such as a notch type provided with a groove, is positioned for locking the hair strand 10 against the body 8 during the hair curling step. Thus, the fixed resting element 13 appears to be fixed to the body 8 and it is not able to move or be moved from its fixed position.

The fixed resting support 13 is provided with two further silicon elements 25 (Figure 7) positioned, respectively, on each of the elements 14a, 14b of the guide 14 so as to make more delicate the hair strand 10 locking onto the fixed resting element 13 during the hair curling step, so as not to damage the hair strand at the point where it is locked.

The first opening 9 is positioned so that the insertion of the hair strand 10 within the body 8 occurs in such a way that the hair strand 10 is in a position

substantially perpendicular with respect to the bar 3. This is a particularly useful feature that allows the hair strand to avoid to be twisted onto itself where it is locked when the hair strand is inserted in the device in a position substantially parallel to the bar, as occurs in some known in the art hair curling devices, thus avoiding the formation of hair knotting and thickening at the hair root.

The distance X between the fixed resting element 13 and the bar 3 is less than 50 mm, so as to minimize the dead zone wherein the hair strand is not curled, thus allowing also the shorter hair to be curled and providing curled hair having an excellent aesthetic effect also at the hair root.

The fixed resting support 13 is positioned just below the top of the bar 3 so that, once the hair strand 10 has passed through the first opening 9, and the distance X separating the first opening 9 and the bar 3 has been covered, the hair strand 10 is wrapped around the bar 3. Thus, the length of the hair strand portion that is not curled is further reduced to a minimum.

The hair curling device 1 of the present invention further comprises a rotatable element 5 arranged horizontally at the base of the bar 3 so as to rotate around the bar 3, which remains fixed. When such a rotatable element 5 is actuated, it rotates in clockwise or in a counter-clockwise direction, so as to allow the hair strand 10 to be wrapped around the outer surface 4 of the bar 3. The rotation axis around which the rotatable element 3 rotates is substantially parallel to the vertical direction of the bar 3.

The hair curling device 1 of the present invention further comprises a motor 6 for driving the rotation of the rotatable element 5.

In the preferred embodiment shown in Figure 4, the motor 6 is vertically arranged and is provided on the top portion of a motor gear 23 which engages in an integral manner with the gear 22 of the rotatable element 5 provided at the base of the rotatable element 5 itself. The rotation axis around which the motor 6 rotates is substantially the same rotation axis around which the rotatable element 5 rotates. In this way, once the motor 6 is activated, the motor gear 23 is also activated

which in turns activates the gear 22 of the rotatable element 5 which allows the rotatable element 5 itself to rotate around the bar 3.

Conversely, in the embodiment shown in Figure 5, the motor 6 is horizontally arranged, so that the rotation axis around which the motor 6 rotates is substantially perpendicular to the rotation axis around which the rotatable element 5 rotates. In this case, the motor 6 is provided with a worm screw 24, positioned laterally to the motor 6, which engages in an integral manner with the gear 22 of the rotatable element 5. In this way, once the motor 6 is activated, it activates the worm screw 24 which in turn activates the gear 22 of the rotatable element 5 which allows the rotatable element 5 itself to rotate around the bar 3.

A magnet 18 is positioned onto the rotatable element 5 (Figure 3). In this way, during the rotation of the rotatable element 5, the magnet 18 rotates as well.

Preferably, a sensor 19 is positioned in the body 8 at said rotatable element 5.

In this way, the sensor 19 is able to detect the magnetic field generated by the magnet 18 when the sensor19 faces the magnet 18.

Preferably, the magnet 18 and the sensor 19 cooperate to provide a reference position for the rotatable element 5, so that the rotatable element 5 assumes a position before the hair curling step starts which is suitable for the insertion of the hair strand in an opening, and then to count the number of revolutions effected by the rotatable element 5 during the hair curling step.

An electronic card 20 for managing the functioning of the device 1 is positioned inside the handle 2. Via the electronic board 20 it is possible to manage the temperature control of the heating element, the clockwise or anti-clockwise movement of the rotatable element, activated by the user via a button placed in the handle and the setting time of the hair strand around the bar for the hair curl formation.

A button 7 that activates/deactivates the motor 6 to start/stop the hair curling step is positioned at the top portion of the handle 2.

Operatively (Figure 6), before starting the hair strand curling step, the portion of the hair strand 10 nearest the user scalp 15 is prepared for the subsequent curling, by securing it to the fixed resting element 13, letting it pass through the first opening 9 provided in the body 8 of the device 1 so as to be arranged in a horizontal position with respect to the vertical position of the bar 3, and by wrapping it around the outer surface 4 of the bar 3 itself. When the hair strand 10 is ready to be curled, the button 7 is pressed activating in such a way the motor 6, which drives the rotatable element 5 which rotates around the bar 3 onto which the hair strand 10 is wound which is then subjected to the hair curling step. When the whole hair strand 10 is subjected to curling, the user releases the button 7 to turn off the motor, waits until the end of the setting time and vertically slides downwards the device 1 thus applying a minimum force which allows the curled hair strand 10 to disengage from the locking exerted on it by the fixed resting element 13, without the risk that the so formed curl on the hair strand is de-curled, risk which is instead present in some prior art devices. These operations will be repeated for a number of other hair strands according to the user needs.

A second alternative preferred embodiment is shown in Figure 8; it differs from the first embodiment shown with reference to Figures 1-7 by the fact that the elements 14a, 14b have a profile such as to form a larger angle between them compared to the same angle formed by the elements 14a, 14b shown in Figure 1-7. Consequently, the first opening 9 in this second embodiment is wider and allows the user to insert the hair strand 10 into the first opening 9 in an easier way. Furthermore, the second embodiment shown in Figure 8 differs from the first embodiment shown with reference to Figures 1-7 by the fact that the protective cap 21 of the bar 3 has a greater height that allows to overcome the height of the edge of the wall 16 of the body 8 of the device and has a tip with an elongated shape to improve the insertion of the hair strand. In this way an easiest insertion of the hair strand through the first opening 9 and the second opening 11 is provided since the user has only to place the hair strand 10 close to a side of the protective

cap 21 and then to follow down the profile of the cap 21 and then the profile of the bar 3 to engage the hair strand 10 in the first and second openings 9,11. Furthermore, a further safety is guaranteed to the user during the use of the device, thus minimizing the possibility of burning himself/herself if he/she accidentally comes into contact with the heated bar 3. Furthermore, it allows to easily divide the hair strand into two distinct sections which will be positioned at the two sides of the bar 3 to achieve a double hair curl.

As described above with reference to the first embodiment shown in Figures 1-7 and with reference to the second embodiment shown in Figure 8, the bottom of the guide 14 onto which the fixed resting element 13 is positioned may have a base section more or less extensive, which determines the hair strand width that can be locked onto the fixed resting element 13 and, consequently, the hair strand width that can be curled during each hair curling step.

In order to avoid to be obliged to carry out a series of hair curling devices of the present invention one similar to each other and which differ one each other only by the width of the fixed resting element 13 according to the desired hair strand consistency each time a hair curling step is activated, the device 1 of the present invention is further provided with one or more accessories, herein defined as adapters 26 for the fixed resting element 13 (Figure 9), wherein each adapter 26 is dimensioned in such a way to be able to fit to the space formed in the guide 14 between the elements 14a, 14b and to be fixed therebetween in a removable manner so as to cover the underlying fixed resting element 13. Furthermore, each adapter 26 is provided with elements for conveying the hair strand and with a fixed resting element which has a base section different from one adapter to another adapter, so that the user can select the more appropriate adapter 26 to be applied in a removable manner at the first opening 9 of the body 8 of the device 1, depending on the desired consistency of the hair strand to be curled.

In order to obtain different shapes of hair curls, the device of the present invention is further provided with several interchangeable bars 3 each having a proper

section different from the section of the other bars; by way of example, Figure 10 shows two embodiments, identical one each other, except for the fact of the different diameter of the two cylindrical shaped bars 3a, 3b. An interchangeable bar 3 is inserted, in a removable manner, in the handle via a lock/unlock mechanical device, for example a bayonet device, and it is provided with electrical terminals for interconnecting with the heating element and the temperature sensor placed at the inside of the bar 3 itself.

Of course, to those skilled in the art will be evident many modifications and variations of the preferred embodiments described above, still remaining within the scope of the invention.

Accordingly, the present invention is not limited to the preferred embodiments described, illustrated only by way of example and not limitative, but is defined by the following claims.

CLAIMS.

1. Curling hair device (1) comprising:

   - a handle (2);

   - a bar (3) having an arranged vertically elongated shape and being supported by said handle (2), said bar (3) having a curling hair outer surface (4);

   - a rotatable element (5) rotating around said bar (3) to wrap the hair around it;

   - a motor (6) for driving said rotatable element (5);

   - a heating element adapted to heat said outer surface (4) of the bar (3);

   - a body (8) spaced from said bar (3) and arranged substantially all around it;

   characterized in that said body (8) is provided with a first opening (9) for inserting a hair strand (10) to be curled inside the device (1) and in that a fixed resting element (13) to lock said hair strand (10) during curling is provided at said first opening (9).

2. Curling hair device (1) according to claim 1, wherein said first opening (9) is positioned so that said insertion inside the device (1) of said hair strand (10) occurs so that the hair strand (10) is in a position substantially perpendicular to said bar (3).

3. Curling hair device (1) according to claim 1, wherein said first opening (9) comprises a guide (14) to facilitate the passage of the hair strand (10) within the body (8) before its curling, wherein said guide (14) comprises two elements (14a, 14b) of elongated shape for conveying the hair strand (10) having a profile such that the distance between the two elements (14a, 14b) gradually decreases going from one end to the opposed one of said elements (14a, 14b).

4. Curling hair device (1) according to claim 3, wherein said fixed resting element (13) is positioned at the lower portion of said guide (14), in the

narrowest point between said two elements (14a, 14b), for locking said hair strand (10) against said body (8) during curling.

5. Curling hair device (1) according to any one of the preceding claims, wherein said body (8) is provided with a second opening (11) for the let exit from the device (1) the free end portion (12) of said strand (10), that is portion of the hair strand farthest from the user scalp (15).

6. Curling hair device (1) according to claim 5, wherein said second opening (11) is positioned on the opposite side of said first opening (9) with respect to the bar (3), at a lower height of the body (8).

7. Curling hair device (1) according to any one of the preceding claims, wherein said body (8) is constituted by a wall (16) of substantially circular or elliptical shape such as to define a space (17) between said wall (16) and said bar (3).

8. Curling hair device (1) according to any one of the preceding claims, wherein said bar (3) is provided on its upper portion of a protective cap (21) that does not conduct heat.

9. Curling hair device (1) according to claim 8, wherein said protective cap (21) is of such a dimension that the protective cap (21) applied to the bar (3) exceeds the height of the top of the wall (16) of said body (8) arranged around said bar (3).

10. Curling hair device (1) according to any one of the preceding claims, wherein said rotatable element (5) is arranged horizontally at the base of said bar (3) so that the rotation axis around which said rotatable element (5) rotates is substantially parallel to the vertical direction of said bar (3).

11. Curling hair device (1) according to any one of the preceding claims, which further comprises a set of adapters (26) to the fixed resting element (13), each adapter (26) being of such a dimension to be able to fit to the space formed in the guide (14) between said elements (14a, 14b) and to be able to be fixed in a removable manner between said elements (14a, 14b) so as to cover the underlying fixed resting element (13), each one of

said adapters (26) being also provided in turn of a fixed resting element (13) having a different base section with respect to the other adapters (26).

12. Curling hair device (1) according to any one of the preceding claims, wherein said bar (3) is interchangeable.

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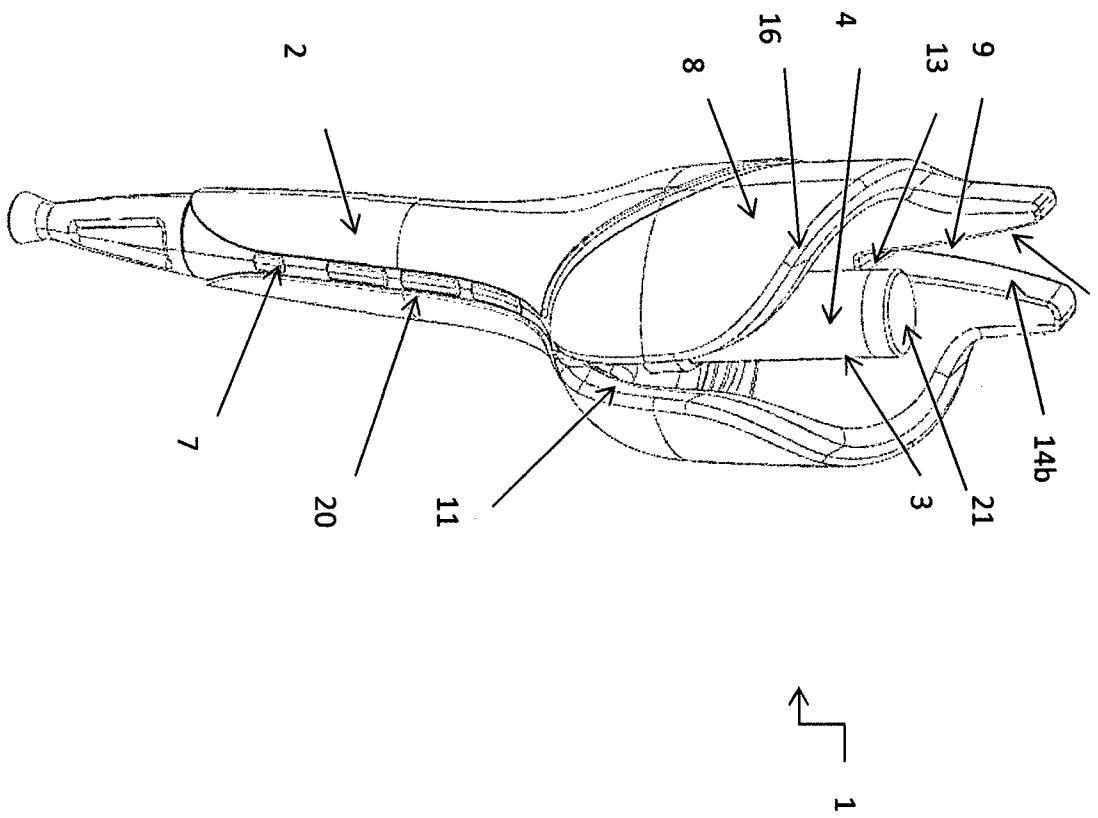


Fig. 1

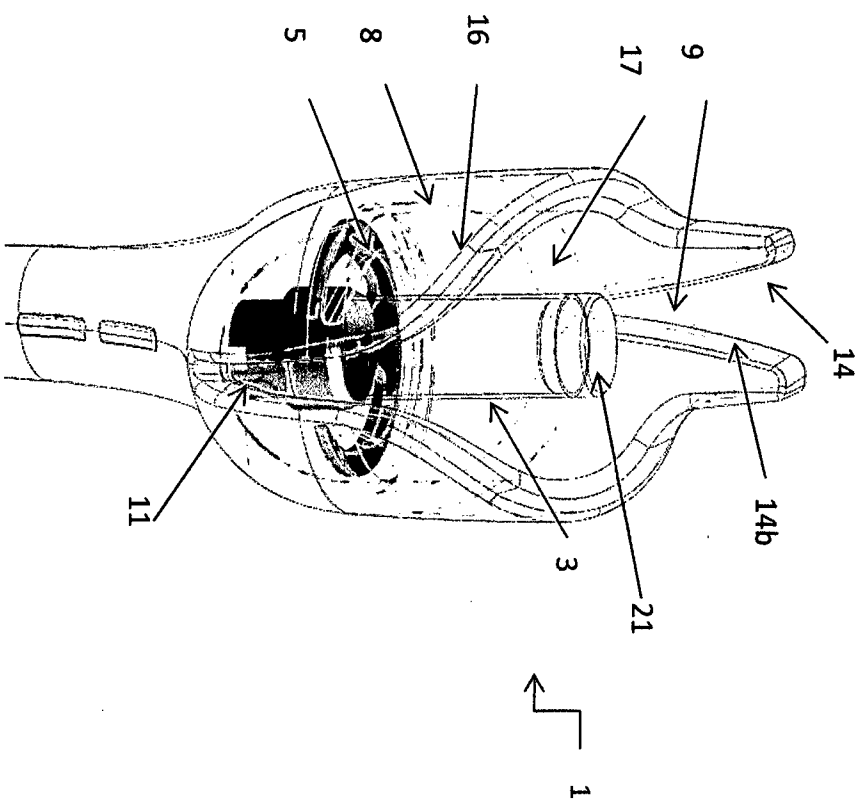


Fig. 2

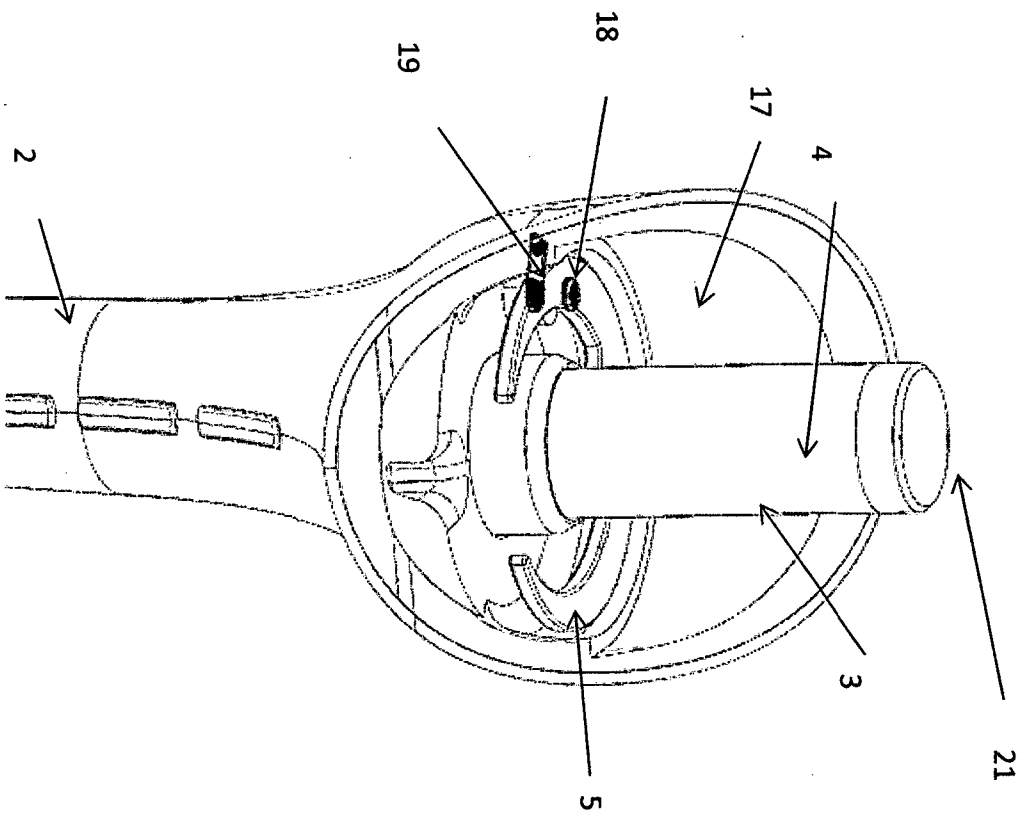


Fig. 3

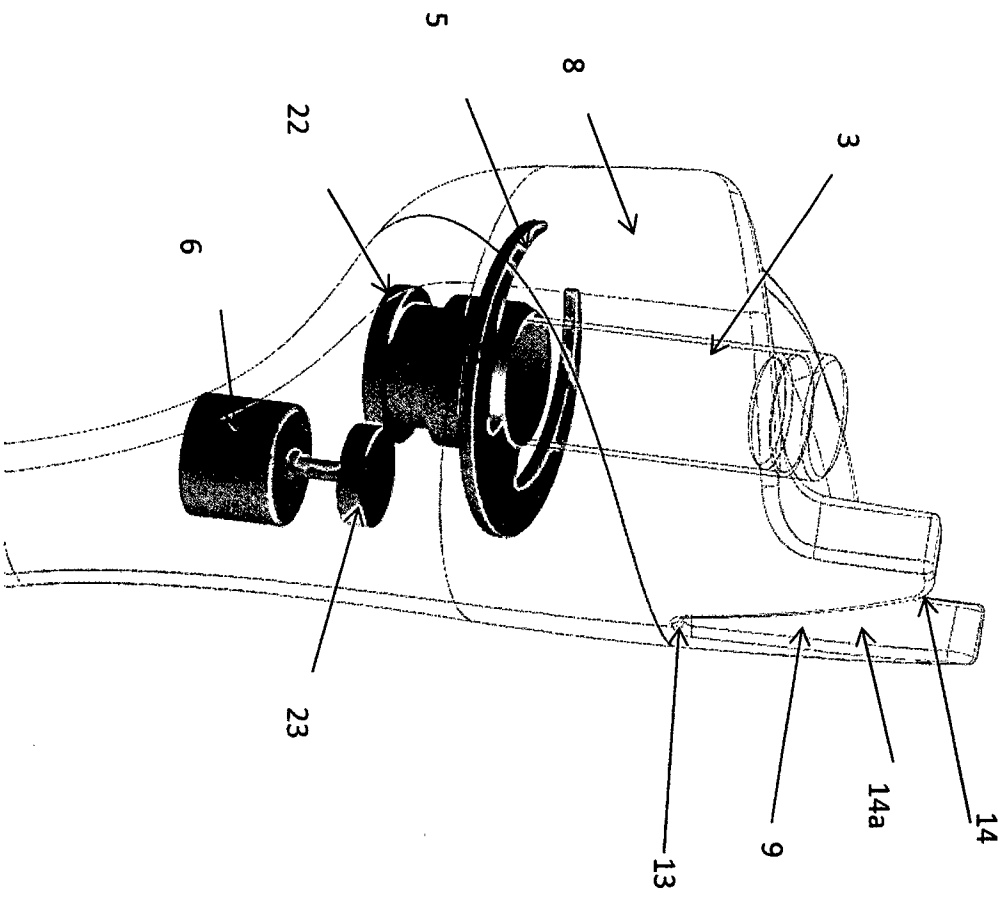


Fig. 4

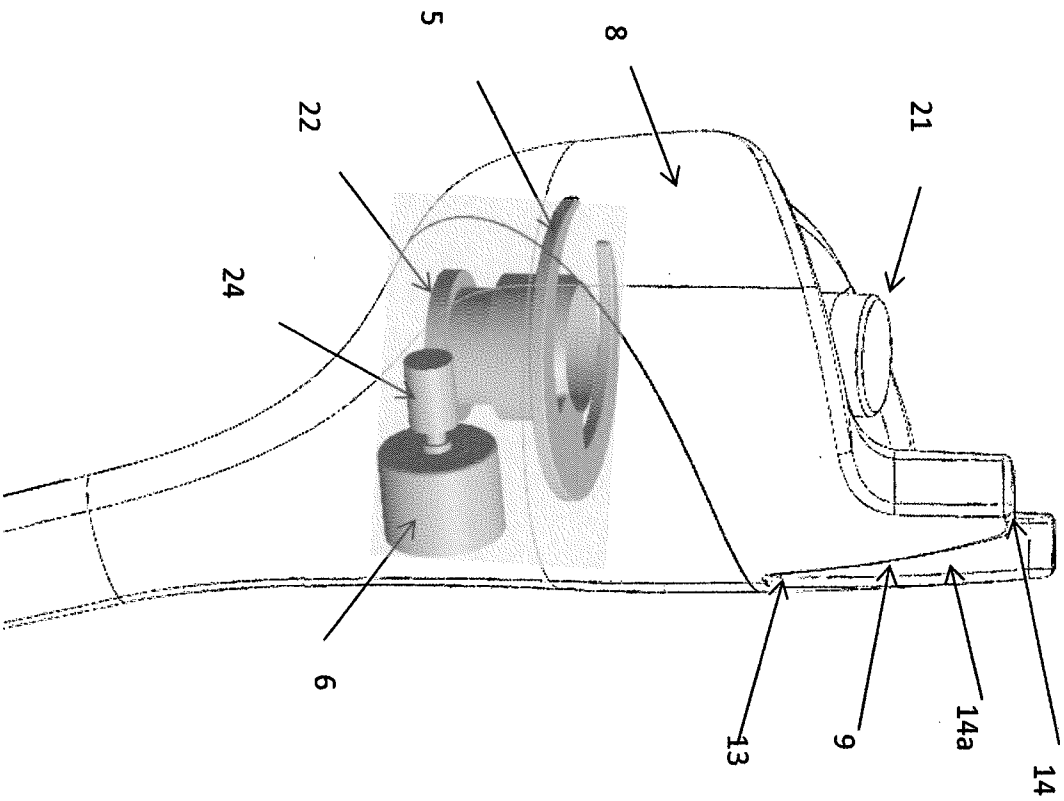


Fig. 5

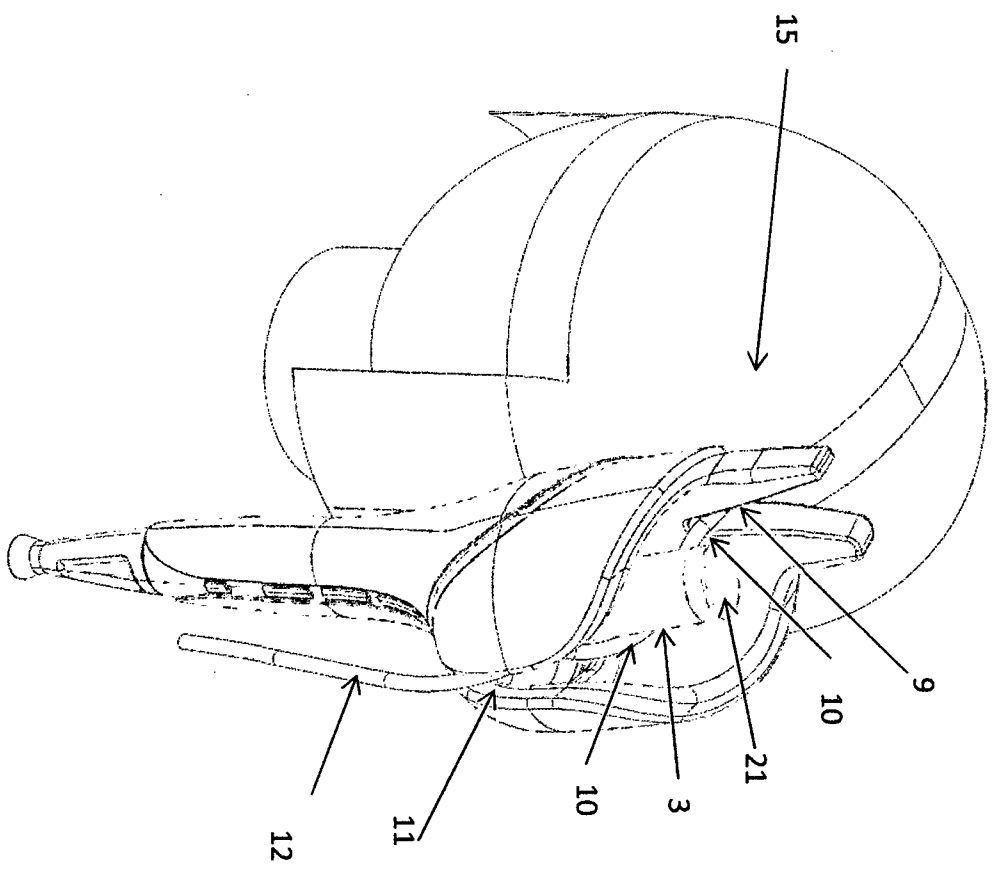


Fig. 6

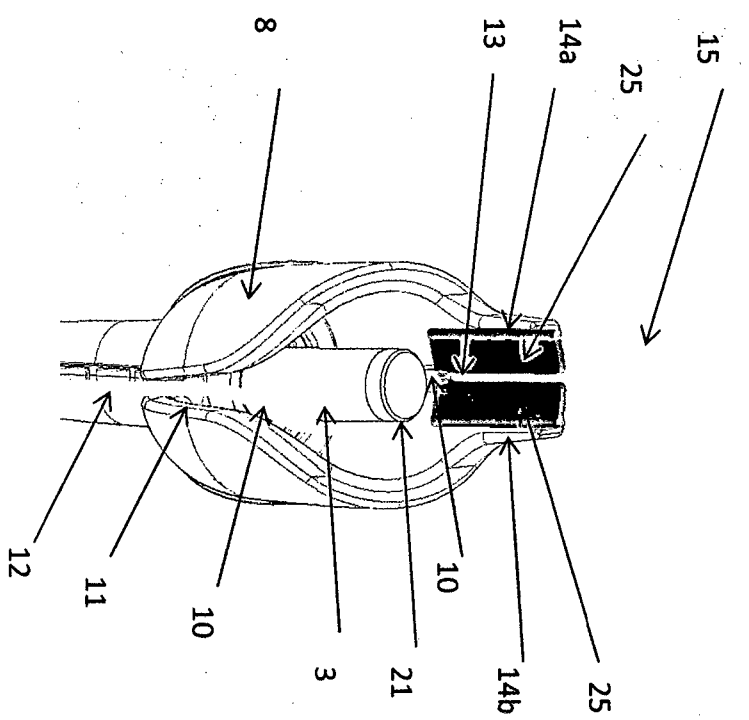


Fig. 7

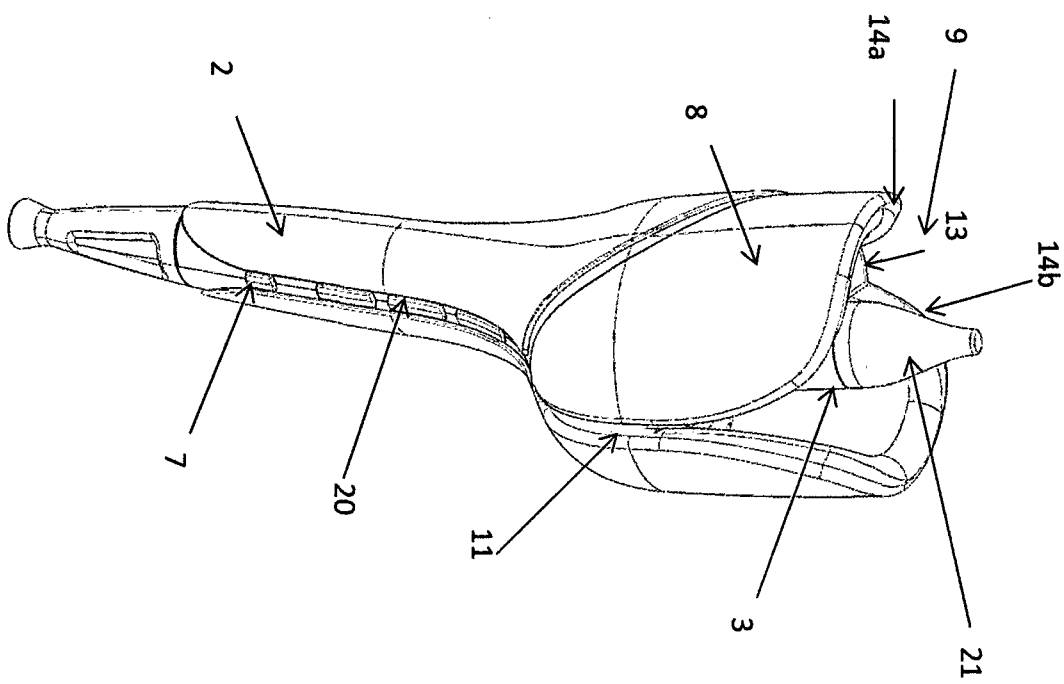


Fig. 8

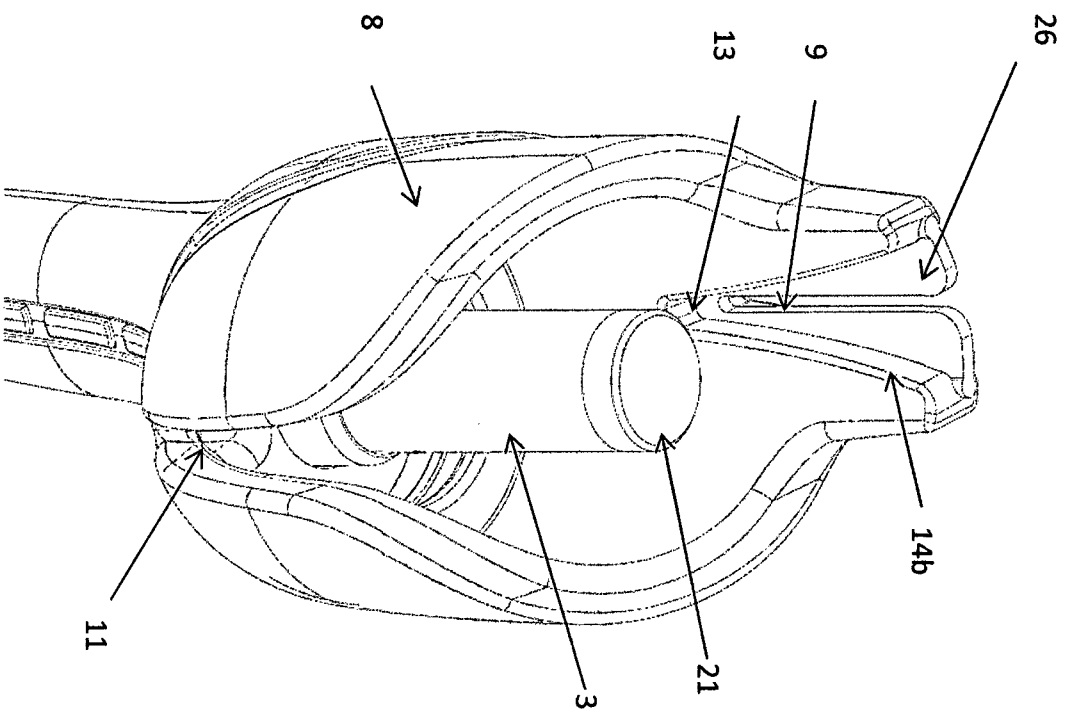
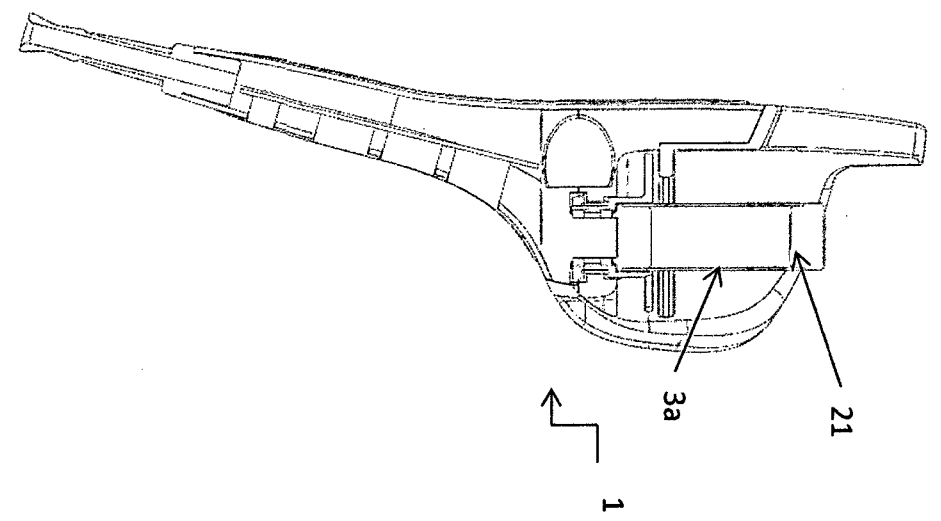


Fig. 9



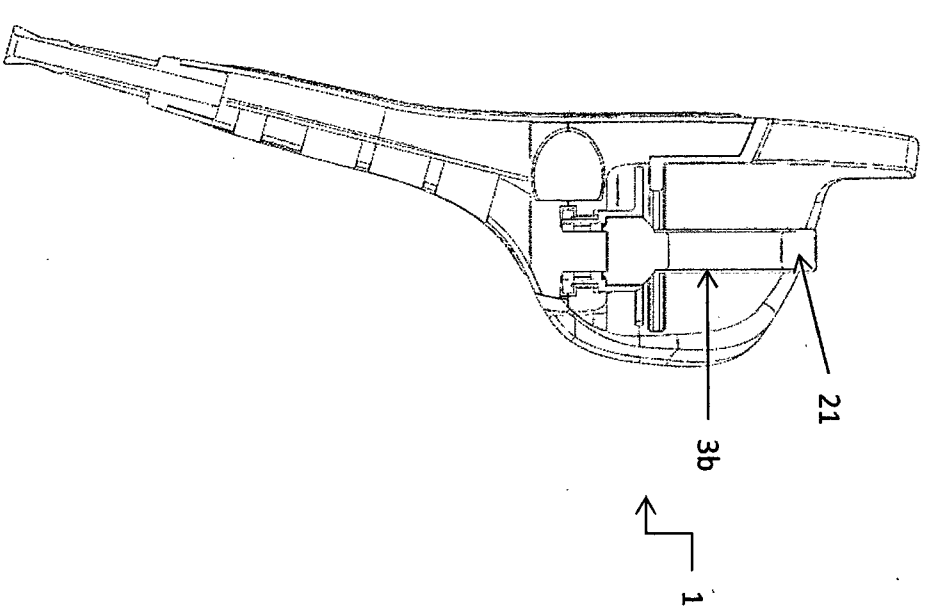


Fig. 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/000310

A. CLASSIFICATION OF SUBJECT MATTER
INV. A45D1/04 A45D1/10 A45D6/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A45D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 101 391 803 B1 (PARK CHANG SU [KR]) 7 May 2014 (2014-05-07) the whole document & US 2015/114425 A1 (PARK CHANG SU [KR]) 30 April 2015 (2015-04-30) paragraphs [0040] - [0117]; figures 1-7	1,2,5,7, 10
X	CN 204 132 655 U (SUN LUEN ELECTRICAL MFG CO LTD) 4 February 2015 (2015-02-04) the whole document	1,3,7,8, 10
A	WO 2012/080751 A2 (TF3 LTD [GB]; DE BENEDICTIS ALFREDO [GB]; HUGHES MARK CHRISTOPHER [GB]) 21 June 2012 (2012-06-21) cited in the application the whole document	1,2

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"E" earlier application or patent but published on or after the international filing date

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"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 when the document is taken alone

"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

Date of the actual completion of the international search	Date of mailing of the international search report
1 July 2016	08/07/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Dinescu, Daniela

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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