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(54) Modular hair styling apparatus

(57) A hair-styling device (1) comprising a handle (2) with first (10) and second (20) housings having proximal (11) and distal (12) ends. A pivot joint is formed at the proximal ends (11) to bias the distal ends (12) away from each other. The distal ends (12) have a concave opening (30) with male terminal pins disposed therein. A plurality of sets of hair-styling attachments are provided. Each attachment has a proximal end, a distal end, and a heating element. A female connector is formed on the proximal end of the attachment. The proximal ends of the attachments are configured to telescope into the concave opening (30) so that the female connectors mate with the male terminal pins. A lock (8) is provided for locking the handle (2) in a closed position with the housings parallel to one another. A power cord (9) is disposed at the proximal end (11) of the handle (2) for supplying power to the device.

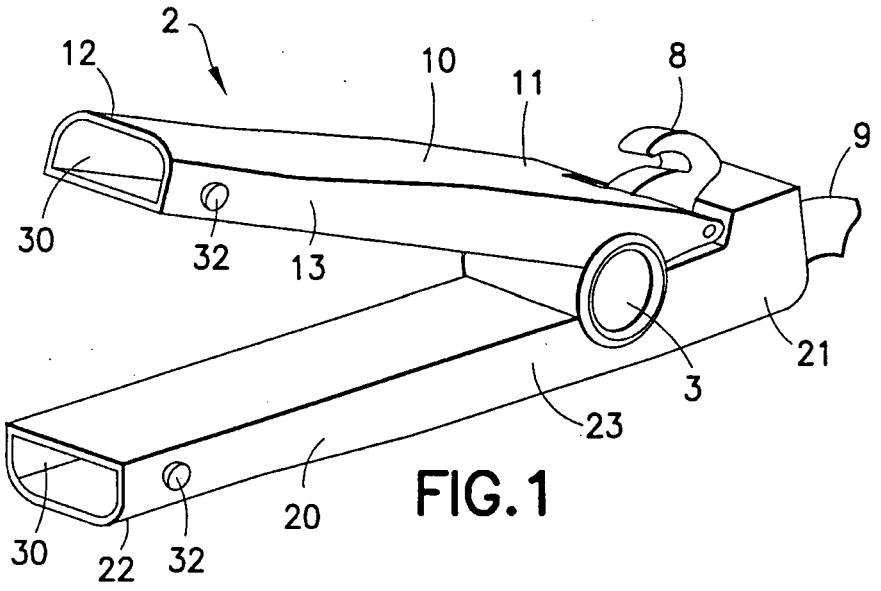

FIG. 1

EP 2 319 353 A1

Description

BACKGROUND OF THE INVENTION

[0001] Field of the Invention: The invention relates to an electrical hair-curling/flat iron with interchangeable parts.

[0002] Description of the Prior Art: Hair-curling irons and hair straighteners are used on a daily basis by hair stylists and individual at-home users. Hair stylists use these devices to give their customers a professional look. Similarly, individuals use curling irons and straighteners to impart a "just left the salon" look or as a quick touch up as a means of quickly styling their hair before leaving the house. Curling irons and straighteners have become an integral part of many women's routines. However, a limitation of these devices is that each can only be used for one type of styling.

[0003] Curling irons are used to give hair a curly or wavy look. In general, curling irons consist of a handle with an elongated heated unit protruding from the distal end of the handle. A thumb-operated clamping means is pivotally attached to the handle and is configured to clamp hair against the heated unit. In operation, a user heats the unit by electrical or battery power. When sufficiently heated, the user, holding the curling iron in a position substantially perpendicular to the direction of their hair, depresses the thumb-operated clamp and positions a plurality of strands of hair between the elongated heated unit and the clamp. The user then releases the clamp, thereby holding the hair between the clamp and the heated unit. Next, the user, while maintaining the substantially perpendicular orientation, rotates the curling iron around its longitudinal axis, thereby curling the hair around the curling iron. When the user has finished curling a group of strands, the user depresses the thumb-operated clamp and releases the hair. Upon release, the released hair will have a curly or wavy appearance due to the combination of the heat from the heated unit, the pressure between the clamp and the elongated unit, and the rotational motion. The user then repeats this process on additional sections of hair. The size or tightness of the curls can be controlled through a number of factors. First, the width or diameter of the elongated heating element can affect the size of the curls. Second, the user may alter the appearance of her hair by the force with which she rotates the curling iron. Lastly, a user may only apply the curling iron to certain parts of her hair (i.e. the bottom ends) to impart a specific style. In each of these instances, the finished look of the user's hair will be either curly or wavy. Thus, the user cannot rely on the curling iron to straighten their hair.

[0004] A hair straightener, also known as a flat iron, is used to impart a substantially flat or straight style. Thus, a straightener is used to impart a substantially opposite style from that of the curling iron. A straightener generally consists of a handle and two opposed heating anvils. The handle has a top section pivotally attached to a bottom section. In one popular embodiment, the straightener has a V-shaped design in which the top and bottom sections of the handle meet at a pivot joint at the apex of the "V." In this embodiment, top and bottom heating anvils correspond to the top and bottom sections of the handle, respectively. In operation, the user heats the device using either electrical or battery power. When the straightener is sufficiently heated, the user, holding the device by the handle, clamps a plurality of strands of hair at a position substantially close to the root of the hair between the top and bottom heating anvils. The user slowly moves the straightener in a downward direction along the length of the hair. The heating units press the hair together eliminating any wrinkles or wavy sections and imparting a substantially straight style. A limitation of hair-straighteners is that they cannot be used to curl hair. Thus, a straightener is of no use to a person looking to alter their hair styles on a frequent basis.

[0005] Furthermore, some devices can be used for various other styling techniques. For instance, some devices consist of a handle with an elongated heated element protruding from the distal end. In operation, the user holds the device at an acute angle to the hair or substantially parallel to the direction of the hair. The user then positions multiple strands of hair so that they are in contact with the elongated heating element. Next, the user rotates the device along a substantially vertical axis, thereby rotating the strands of hair. The device gives hair a curvy or spiraled appearance.

[0006] Straighteners and curling-irons do share several traits in common: they each have long cords that can easily become knotted or tangled, and they each are heated to such a high temperature that they cannot be stored until they have cooled down completely. Thus, to a hairstylist who employs both a curling iron and a straightener on a daily basis, it is likely that both devices would have to be left in the stylist's work area to avoid creating a fire hazard due to the heat of each device. Furthermore, a hairstylist is likely to have at least two curling irons of different diameters. Thus, a stylist will likely have at least one additional device out that will take up valuable room in the stylist's limited work area. In addition, there will be at least one additional power cord exposed, which increases the chance of becoming tangled with other cords and also creates a safety hazard in that a person could trip. Further, the constant rotation of a curling iron can cause irreparable damage to the cord and electrical components in the device. As a result, it would be ideal to combine the straightener and hair-curler into one device.

[0007] In view of the above, it is an object of the invention to provide a modular hair-styling device that can operate as either a curling-iron and a hair straightener by means of interchangeable parts.

[0008] It is a further object of the invention to provide a hair-styling device that has a handle which can be locked in a closed position for use with specific attachments.

[0009] It is yet a further object of the invention to provide a hair-styling device with a power cord that can rotate freely of the device to avoid becoming tangled and that can be replaced if needed.

SUMMARY OF THE INVENTION

[0010] The invention relates to a hair-styling device with interchangeable parts that may be used to impart a variety of styling options. The device includes of a handle assembly and a plurality of attachments, such as, curling, straightening, and spiraling attachments of one or more sizes.

[0011] The handle assembly of the device has a first housing and a second housing. The housings have proximal ends that are hinged to one another, distal ends, and left and right side edges. Each housing has opposite inner and outer surfaces. The inner surfaces face one another and may be substantially planar. The outer surfaces face away from one another and may be generally semi-cylindrical. The proximal end of the first housing may have first and second parallel flanges extending perpendicularly from the left and right edges. The proximal end of the second housing is defined by first and second parallel flanges spaced inward from the left and right edges. Outer surfaces of the first and second flanges of the second housing are in surface-to-surface contact with inner surfaces of the first and second flanges of the first housing.

[0012] A pivot pin is passed through openings in the centers of the flanges creating a pivot joint for biasing the distal ends of the housings away from one another. A locking mechanism is provided for locking the housings in a parallel position. The distal end of each housing further comprises a concave opening with a terminal fitting therein.

[0013] A power cord extends outward from the proximal end of the first housing and is capable of rotating independently of the device and also is preferably removable from the device. The housings each contain heating circuitry extending toward the distal ends of the housings and connected to the male terminal fittings.

[0014] The invention also comprises a set of hair-curling attachments. The hair curling attachments preferably include an elongated cylindrical barrel attachment and a clamp attachment. The barrel attachment and clamp attachment each have a proximal end defined by an electrical connector. The electrical connector is mateable with the male terminal fittings on the distal ends of the housings. The proximal ends of the attachments each preferably are configured to be telescoped into the concave openings so that the electrical connectors and terminal fittings mate. The clamp is defined by a semi-tubular shape and is dimensioned to nest around part of the barrel attachment. The curling attachments may be of a variety of shapes and sizes.

[0015] The hair styling device preferably further comprises at least one pair of hair-straightening attachments. The hair-straightening attachments are defined as a first flat attachment and a second flat attachment. The proximal ends of the attachments are configured to telescope into engagement with the distal ends of the housings and are defined by electrical connectors. The electrical connectors on the proximal ends of the flat attachments are mateable with the male terminal fittings on the distal ends of the housings of the handle assembly.

[0016] The hair styling device preferably further comprises a spiraling attachment. The spiraling attachment is a elongated cylinder or a tapered rod with a proximal end with two prongs defined by electrical connectors. The prongs are configured to telescope into engagement with the distal ends of the housing. The electrical connectors are arranged in a manner that allows them to connect with the terminal fittings when the first and second housings are in a substantially closed position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. 1 is a perspective view of the handle of the device.

[0018] FIG. 2 is a perspective view of an embodiment of the device with an elongated conical attachment.

[0019] FIG. 3 is an exploded perspective view of the device with the elongated conical attachment.

[0020] FIG. 3A is an end view of the proximal end of the attachment shown in FIG. 3.

[0021] FIG. 3B is an end view of the distal end of the handle.

[0022] FIG. 4 is a perspective view of an embodiment of the device with an elongated cylinder attachment.

[0023] FIG. 5 is an exploded perspective view of the device with the elongated cylinder attachment.

[0024] FIG. 6 is a perspective view of the device with small curling attachments.

[0025] FIG. 7 is an exploded perspective view of the device with the small curling attachments.

[0026] FIG. 7A is an end view of the proximal ends of the attachment shown in FIG. 7.

[0027] FIG. 8 is a perspective view of the device with large curling attachments.

[0028] FIG. 9 is an exploded perspective view of the device with large curling attachments.

[0029] FIG. 10 is a perspective view of the device with flat attachments.

[0030] FIG. 11 is an exploded perspective view of the device with flat attachment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0031] With reference to the drawings, the present invention will now be described based on an embodiment thereof. As shown in FIG. 1, the hair styling device 1 has a handle assembly 2 with a first housing 10 having a proximal end 11, a distal end 12, and left and right edges 13, 14 and a second housing 20 with a proximal end 21,

a distal end 22, and left and right edges 23, 24. The first housing 10 has an inner planar surface 15 facing the second housing 20 and an outer surface 16. Likewise, the second housing 20 has an inner planar surface 25 facing the first housing 10 and an outer surface 26. The housings 10, 20 can have a variety of different shapes, e.g. rectangular or semi-cylindrical.

[0032] Left and right parallel flanges 17, 18 extend perpendicularly from the proximal end 11 of the first housing 10 at positions near the left and right edges 13, 14 and toward the second housing 20. Likewise, left and right parallel flanges 27, 28 extend perpendicularly from the proximal end 21 of the second housing 20 at positions spaced from the left and right edges 23, 24 so that outer surfaces of the flanges 27, 28 are in surface-to-surface contact with inner surfaces of the flanges 17, 18.

[0033] The flanges 17, 18, 27, 28 each are further defined by a circular opening at a central position thereof. A pin 3 is inserted into the opening in the first flange 17 and passes through the opening in the flanges 27, 28 of the second housing 20 and the opening in the second flange 18 to securely connect the first and second housings 10, 20. The pin 3 creates a pivot joint whereby the inner surface 15 of the first housing 10 and the inner surface 25 of the second housing 20 may be pivoted toward and away from one another. A spring-loaded protuberance 19 is mounted near the proximal end of the first housing 10 and is configured to bias the distal ends 12, 22 away from one another.

[0034] The proximal end 11 of the first housing 10 is further defined by a locking mechanism 8. The locking mechanism 8 can take a variety of forms. In the preferred embodiment, the locking mechanism 8 is a pivoting "hammer" lock that can be engaged and disengaged by a user. The protuberance 19 projects from the inner surface 15 of the first housing 10. An opening 29 is formed in the inner surface 25 of the second housing 20 at a position corresponding to the protuberance 19. When the locking mechanism is engaged, the inner surfaces 15, 25 of the first and second housing 10, 20 are substantially parallel to each other with the protuberance 19 projecting into the opening 29. When the locking mechanism 8 is disengaged, the distal end 12 of the first housing 10 pivots away from the distal end 22 of the second housing 20 so that the first and second housings 10, 20 form an angle between approximately 20° and 30°. In the disengaged position, the housings 10, 20 may be brought into the substantially parallel position by the application of inward forces on the outer surfaces 16, 26 of the housings 10, 20.

[0035] A power cord 9 extends outward from the proximal end 21 of the second housing 20. The power cord 9 is joined to an electrical connector (not shown) in the second housing 20 that is connected rotatably to electrical contacts (not shown) in the second housing 20. Thus, the power cord 9 is capable of rotating independently of the hair styling device 2. Further, the power cord 9 may be removed from the device by a snapping mechanism.

[0036] The first housing 10 and the second housing 20 each contain heating circuitry (not shown). The heating circuitry extends towards the distal ends 12, 22 of the first housing 10 and the second housing 20. Non-cylindrical concave openings 30 are formed in the distal ends 12, 22 of the first and second housings 10, 20. The male terminal pins 31 are disposed in the concave openings 30 at positions nearest the proximal ends 11, 21 of the housings 10, 20 and at positions to prevent inadvertent contact by a finger. The male terminal pins 31 are part of the to heating circuitry. Spring loaded buttons 32 are formed on either the left or right side edges of the housings 10, 20 at positions corresponding to the concave opening 30. Inward force on the buttons 32 causes a tab 33 located in the concave opening 30 to move in a left-to-right direction.

[0037] As shown in FIG. 2-11, the invention further comprises plural sets of hair styling attachments. As shown in FIGS. 6-9, a hair curling attachment set 4 is provided having a clamp attachment 40 and an elongated barrel attachment 45. The elongated cylindrical barrel attachments 45 can be of varying lengths and diameters to impart different hair styles. The clamp attachment 40 is defined by a part-tubular shape extending through 180° or less. The dimensions of the clamp attachment 40 are such that the clamp attachment 40 can fit snuggly around part of the elongated cylindrical barrel attachment 45. The clamp attachment 40 has a proximal end 41 and a distal end 42. The proximal end 41 is defined by a female connector 43 connected to a heating element. Similarly, the elongated barrel attachment 45 has proximal and distal ends 46, 47, the proximal end 46 being defined by a female connector 48 connected to a heating element. As shown in FIG. 6 and 9, the curling attachments may be of a variety of sizes. FIG. 6 shows a small set of hair curling attachments in which the small diameter clamp attachment 40 is offset toward the elongated barrel attachment 45 so that the clamp 40 and the barrel attachment 45 can nest. Notches 44, 46 are formed near the proximal ends 41, 46 of the clamp 40 and barrel attachment 45. The proximal ends 41, 46 are configured for telescoping closely into the concave openings 30. A plurality of ridges 80, disposed on an upper surface of the attachment near the proximal end ensure a secure connection. Further, the female connectors 43, 48 are configured to mate with the male terminal fittings 31 when the proximal ends 41, 46 are telescoped into the concave openings 30.

[0038] As shown in FIG. 7A, the he female connectors 43, 48 at the proximal ends 41, 46 are narrow rectangular blocks with beveled side edges 81 to facilitate insertion into the concave openings 30. Pin receiving openings 82 extend into the proximal ends of the female connectors 43, 48 and can receive the male terminal pins 31 of the housings 10, 20 so that the male terminal pins 31 can connect to the heating circuitry in the attachments 40, 45 for delivering electrical power to the heating circuitry in the attachments. A base 83 is disposed distally adjacent the connector 43, 48. Additionally, the base 82 has two

rounded corners 84 that are configured to slidable telescope against rounded internal corners in the concave openings 30 when the attachments are oriented properly. However, right angle corners 86 of the base 82 will interfere with the rounded internal corners of the concave openings 30 to prevent the attachments 40, 45 from being inserted in an improper orientation. The ridges 80 project from the distal parts of the base 82 and will snugly engage the interior of the concave opening 30 as the attachments 40, 45 approach complete insertion into the concave opening 30. The absence of ridges 80 at more proximal positions facilitates the initial insertion, but achieve a tight engagement near the end of the insertion. The notches 44, 46 are on the sides of the connectors 43 and 48 and will engage the tabs 33 in the concave opening 30 upon complete insertion of the attachment.

[0039] As shown in FIGS. 10 and 11, the invention further comprises a set of hair straightening attachments 5 comprising a first flat attachment 50 and a second flat attachment 55. The first and second flat attachments 50, 55 can be of a variety of sizes. The first flat attachment 50 comprises a proximal end 51 and a distal end 52. The proximal end 51 is defined by a female connector 48 and is configured the same as the proximal ends 41, 46 of the curling attachments 4. The first flat attachment 50 also contains a heating element (not shown). The second flat attachment 55 comprises a proximal end 56 and a distal end 57. The proximal end 56 is defined by a second female connector 58. The proximal ends 51, 56 are configured for telescoping into the concave openings 30. A plurality of ridges 80, disposed on an upper surface of the attachments 50, 55 near the proximal ends 50, 51 ensure a secure connection. The second flat attachment 55 also contains a heating element. Notches 54, 59 are formed near the proximal ends 51, 56 of the first and second flat attachments 50, 55.

[0040] To attach either the curling attachment set 4 or the straightening attachment set 5, a user aligns the attachment 40, 45, 50, 55 so that the proximal end 41, 46, 51, 56 is aligned near the concave opening 30 and the notch 44, 49, 54, 59 is aligned with the tab 33. The spring loaded button 32 is depressed and one of the attachments 40, 45, 50, 55 is inserted into the concave opening 30 of either the first or second housings 10, 20 so that the male fitting 31 is connected to the female connector 43, 48, 53, 58. The spring loaded button 32 is then released and the tab 33 is biased by the springs into the notch thereby locking the attachment 30, 32, 37, 41 in place. The corresponding attachment 30, 32, 37, 41 is then inserted into the opposite first or second housing 5,8.

[0041] As shown in FIGS. 4 and 5, the invention further comprises an elongated cylinder attachment 6 for achieving spiraled looking hair. The elongated cylinder attachment 6 has a proximal end 60 and a distal end 61. The proximal end is defined by first and second prongs 62, 63 each having a female connector 64, 65 and two notches 66. Each of the first and second prongs 62, 63 is configured the same as the proximal ends 41, 46 of the curling attachment set 4. The elongated cylinder attachment 6 is attached to the handle 2 by aligning the attachment 6 so that the notches 66 are aligned with the buttons 32. The buttons 32 are depressed and the first and second prongs 62, 63 are inserted into the concave opening 30. A plurality of ridges 80, disposed on upper surfaces of the first and second prongs 62, 63 ensure a secure connection. The buttons 32 are released and the tabs 33 are biased by the springs into the notches 66, thereby locking the attachment 6 in place.

[0042] The elongated cylinder attachment 6 further comprises a heating element (not shown). The heating element is connected to the heating circuitry by way of the connection between the first and second female connectors 64, 65 and the male fittings 31 of the housings 10, 20. The elongated cylinder attachment 6 is used to spiral hair.

[0043] As shown in FIGS. 2 and 3, the invention further comprises an elongated conical attachment 7. The elongated conical attachment 7 has a proximal end 70 and a distal end 71. The proximal end 70 is defined by first and second prongs 72, 73, each prong 72, 73 having a female connector 74, 75 and two notches 76. Each of the first and second prongs 72, 73 is configured the same as the proximal ends 41, 46 of the curling attachment set 4.The elongated cylinder attachment 7 is attached to the handle 2 by aligning the attachment 7 so that the notches 76 are aligned with the buttons 32. The buttons 32 are depressed and the first and second prongs 72, 73 are inserted into the concave openings 30. A plurality of ridges 80, disposed on upper surfaces of the first and second prongs 72, 73 ensure a secure connection. The buttons 32 a re released and the tab 33 is fitted into the notches 76, thereby locking the attachment 7 in place.

[0044] The elongated conical attachment 7 further comprises a heating element (not shown). The heating element is connected to the heating circuitry by way of the connection between the first and second female connectors 74, 75 and the male fittings 31 of the housings 10, 20. The elongated conical attachment 7 is used to spiral hair.

[0045] While the invention has been described with reference to at least one preferred embodiment, it is to be clearly understood by those skilled in the art that the invention is not limited thereto. Particularly, the attachments should not be limited to those described herein and can include any heated hair styling apparatus known in the art. For instance, the hair styling attachments may include first and second attachments with an uneven heating surface for imparting a wavy hair style. The first and second hair styling attachments may also have heating elements appropriate for imparting a crimped hair style. Further, the hair styling apparatus may have first and second attachments with a series of inward-facing teeth disposed thereon for simplifying the hair straightening process.

Claims

1. A modular hair styling apparatus comprising:

   a handle having first and second housings with proximal ends hinged to one another, and distal ends with at least one male terminal fitting disposed therein; and
   a plurality of pairs of hair styling attachments, each hair styling attachment in each of the pairs having a proximal end configured for telescoping into engagement with the distal end of one of the first and second housings, the proximal end having at least one terminal configured for mating with the at least one terminal fitting in the corresponding housing when the proximal end is telescoped into engagement with the distal end of the corresponding housing, each of the hair styling attachments further being heatable when the terminal is connected to the terminal fitting.

2. A modular hair styling apparatus according to claim 1, wherein at least one of the plurality of styling attachments comprise an elongated barrel attachment and a part-tubular clamp attachment configured to nest around the elongated barrel attachment.

3. A modular hair styling apparatus according to claim 2, wherein at least one of the plurality of styling attachments comprise a first flat panel and a second flat panel.

4. A modular hair styling apparatus according to any of claims 1-3, further comprising an elongated rod having a proximal end with a first prong defined by a female connector and a second prong defined by a female connector, the first and second prongs being configured for telescoping into the concave openings of both the first and second housings simultaneously.

5. A modular hair styling apparatus according to claim 4, wherein the elongated rod is conical.

6. A modular hair styling apparatus according to any of claims 1-5, wherein the first housing and second housing have substantially planar inner surfaces and semi-cylindrical outer surfaces.

7. A modular hair styling apparatus according to any of claims 1-6, further comprising left and right parallel flanges extending perpendicularly from the proximal end of the first housing at positions near the left and right edges and left and right parallel flanges extending perpendicularly from the proximal end of the second housing at positions spaced from the left and right edges so that outer surfaces of the flanges of the second housing are in surface-to-surface contact with the inner surfaces of the flanges of the first housing, each of the flanges being defined by a circular opening at a central position thereof, and a pin being inserted through the circular openings to create a pivot joint.

8. A modular hair styling apparatus according to any of claims 1-7 further comprising a notch on the proximal ends of the plurality of hair styling attachment and buttons disposed on one of the left and right edges of the first and second housing in communication with tabs in an interior of the concave opening, the tabs being configured to fit snuggly inside the notches, wherein the buttons are engaged to move the tab to allow the insertion of the hair styling attachment, and disengaged to allow the tab to enter the notch.

9. A modular hair styling apparatus according to any of claims 1-8 wherein the proximal ends of the plurality of hair styling attachments have a plurality of ridges for ensuring a secure fit when the proximal end is telescoped into the distal end of the housing.

10. A modular hair styling apparatus according to any of claims 1-9 further comprising a protuberance between the first and second housings for biasing the distal ends of the first and second housings away from one another.

11. A modular hair styling apparatus according to any of claims 1-10 further comprising a power cord attached to at least one of the first and second housings.

12. A modular hair styling apparatus according to any of claims 1-11 wherein a power cord is rotatably connected to electrical contacts in the first housing.

13. A modular hair styling apparatus according to any of claims 1-10 further comprising a locking element for disposing the first and second housings in a closed position with the distal ends of the first and second housings being substantially adjacent.

14. A modular hair styling apparatus according to any of claims 1-13 wherein a locking mechanism is engaged when the hair styling attachment is attached to the first or second housings.

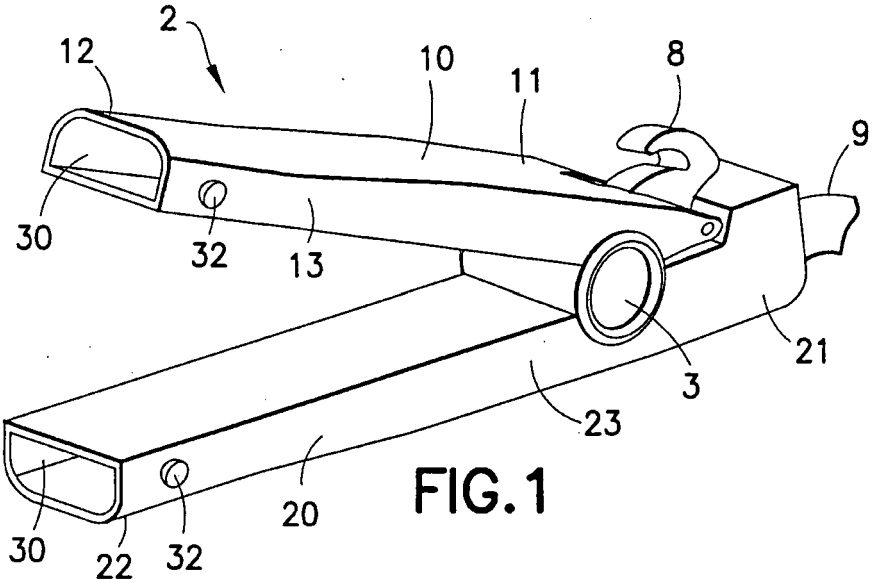

FIG.1

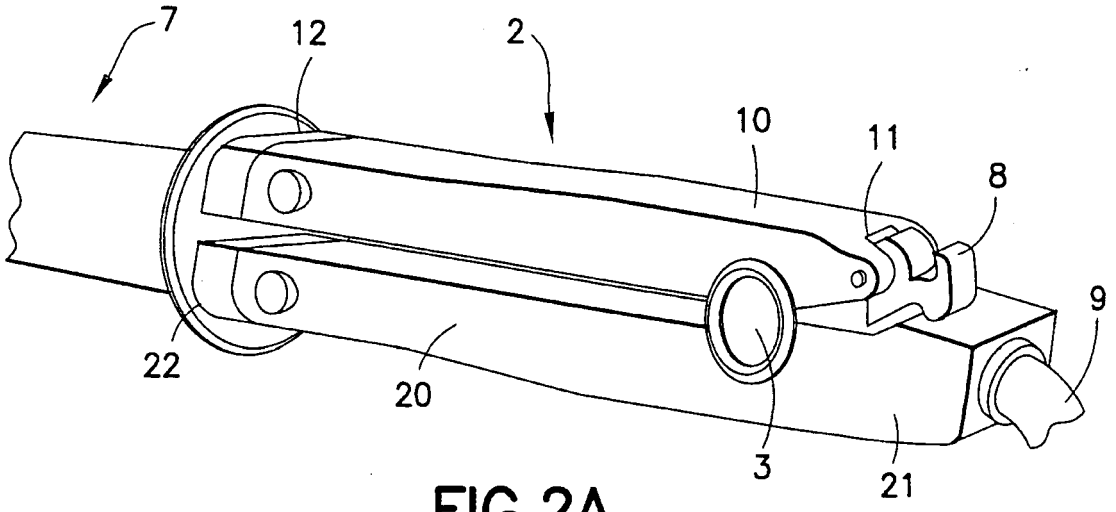

FIG.2A

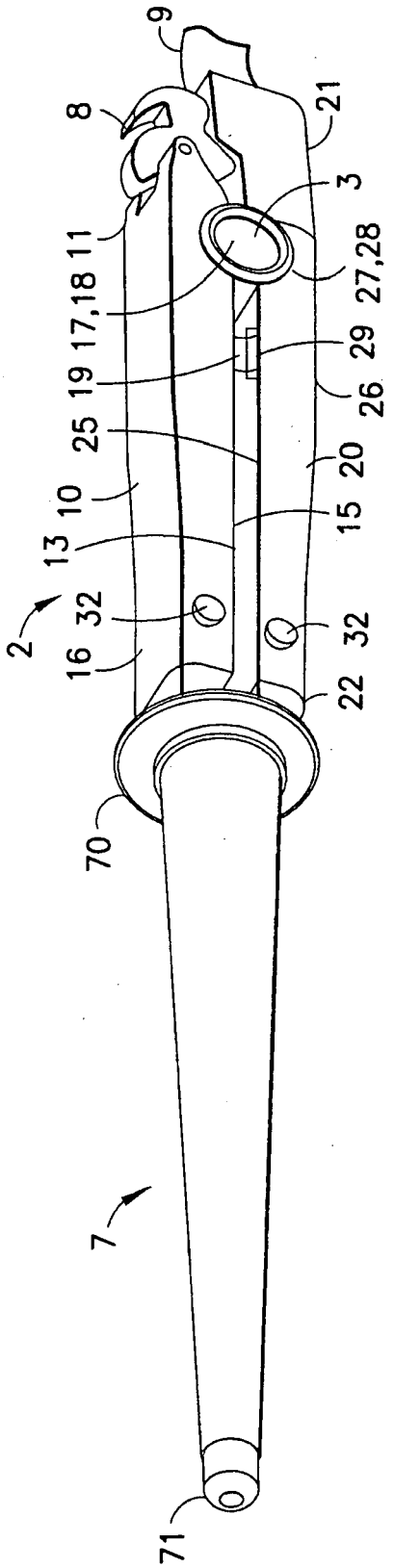
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FIG.2

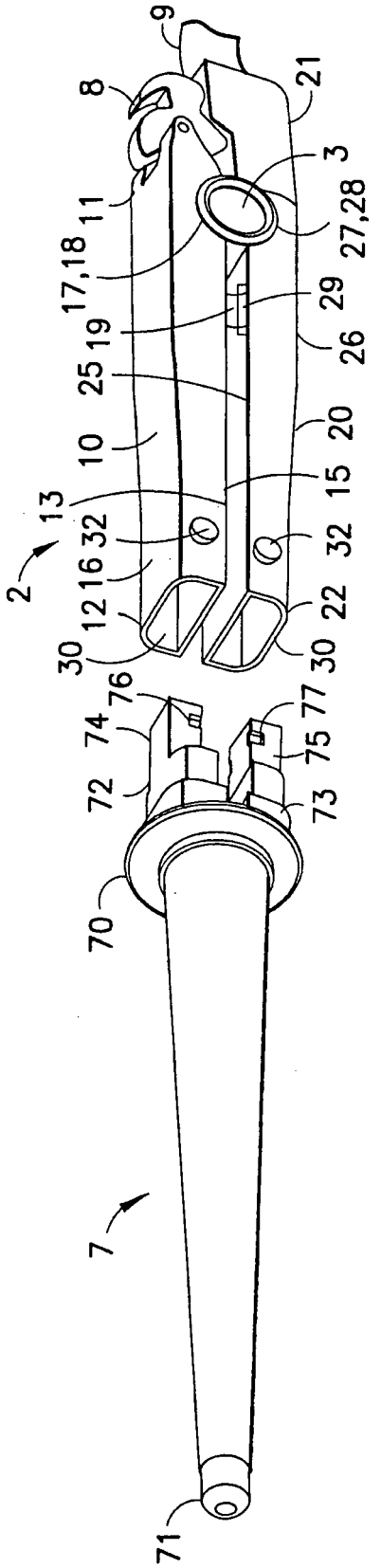
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FIG.3

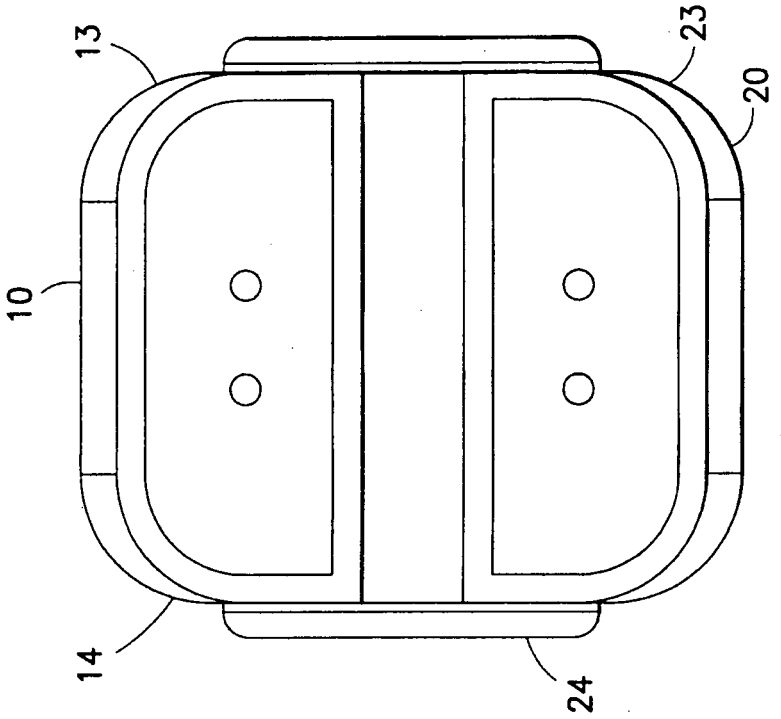

FIG.3B

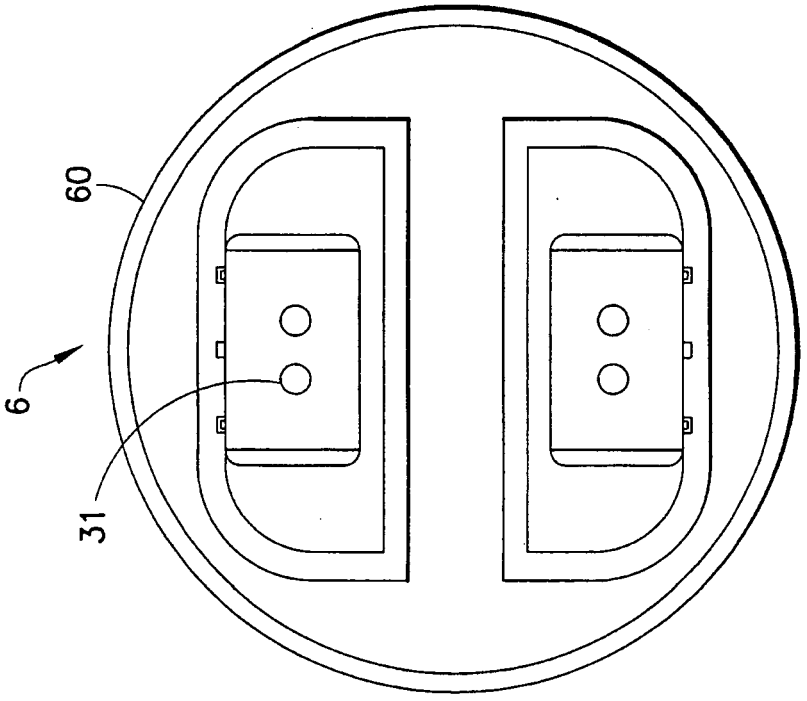

FIG.3A

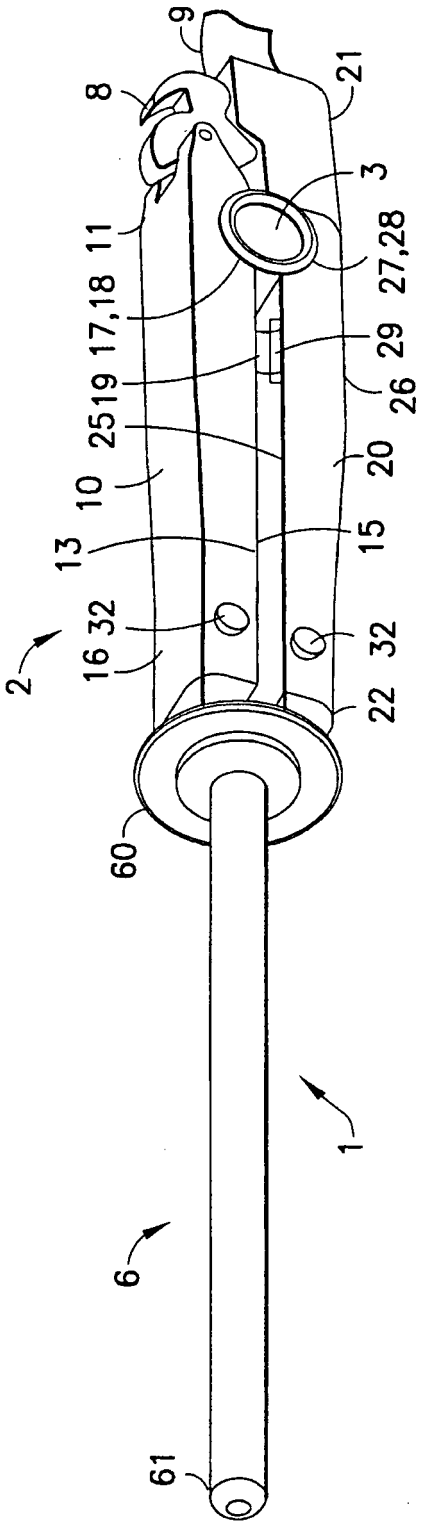
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FIG.4

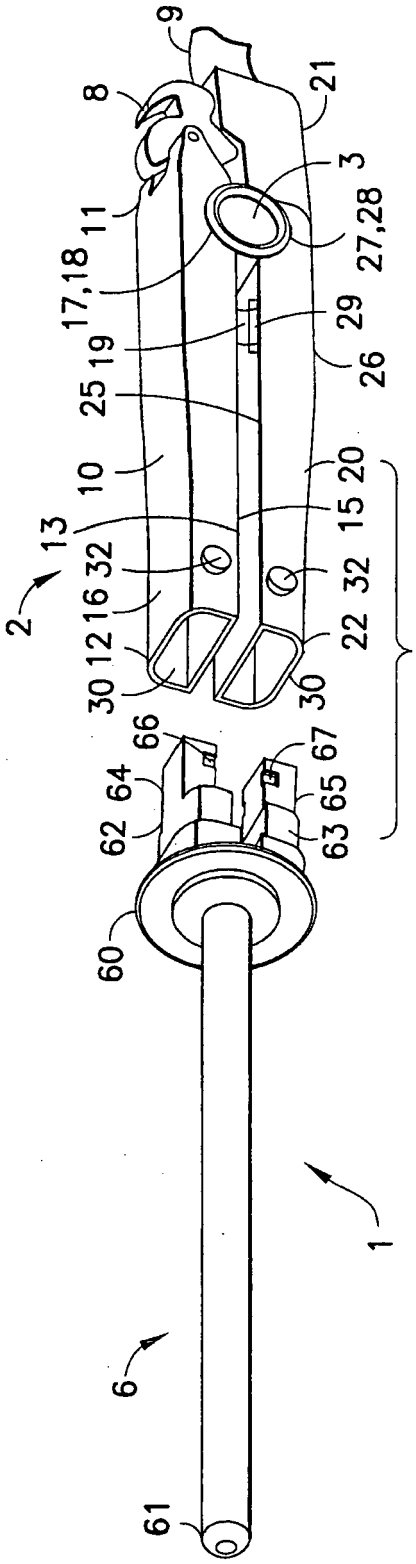
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FIG.5

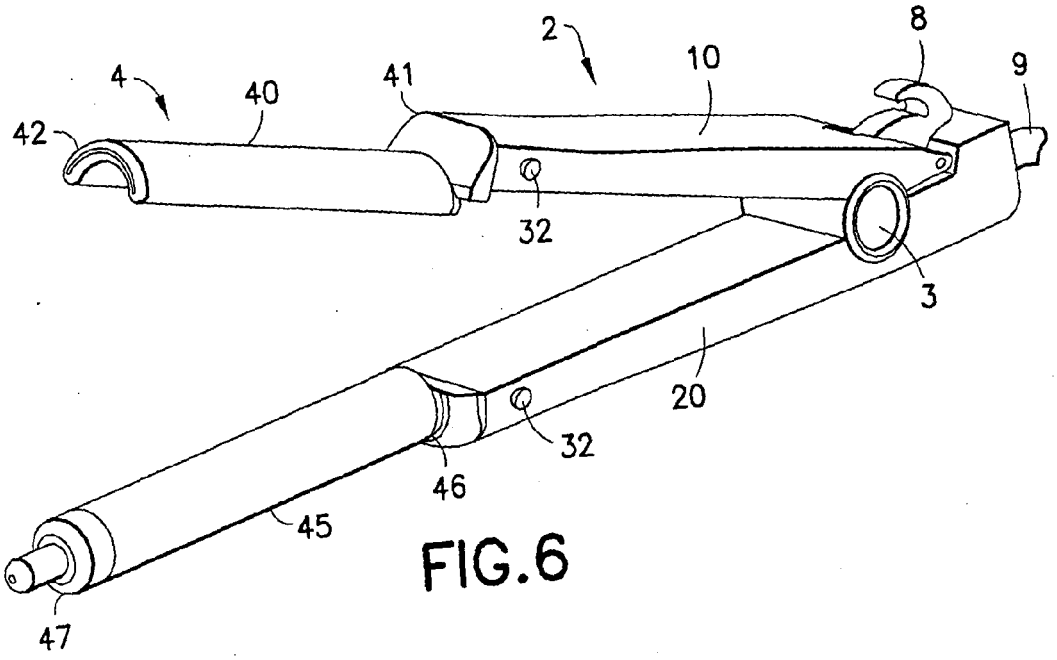
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FIG.6

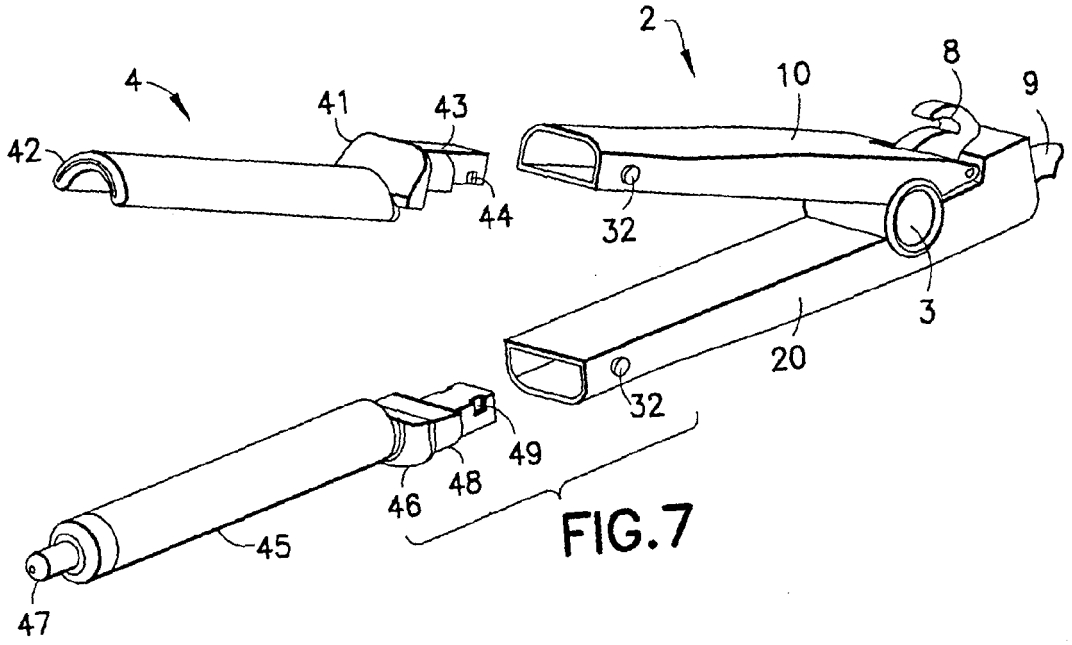
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FIG.7

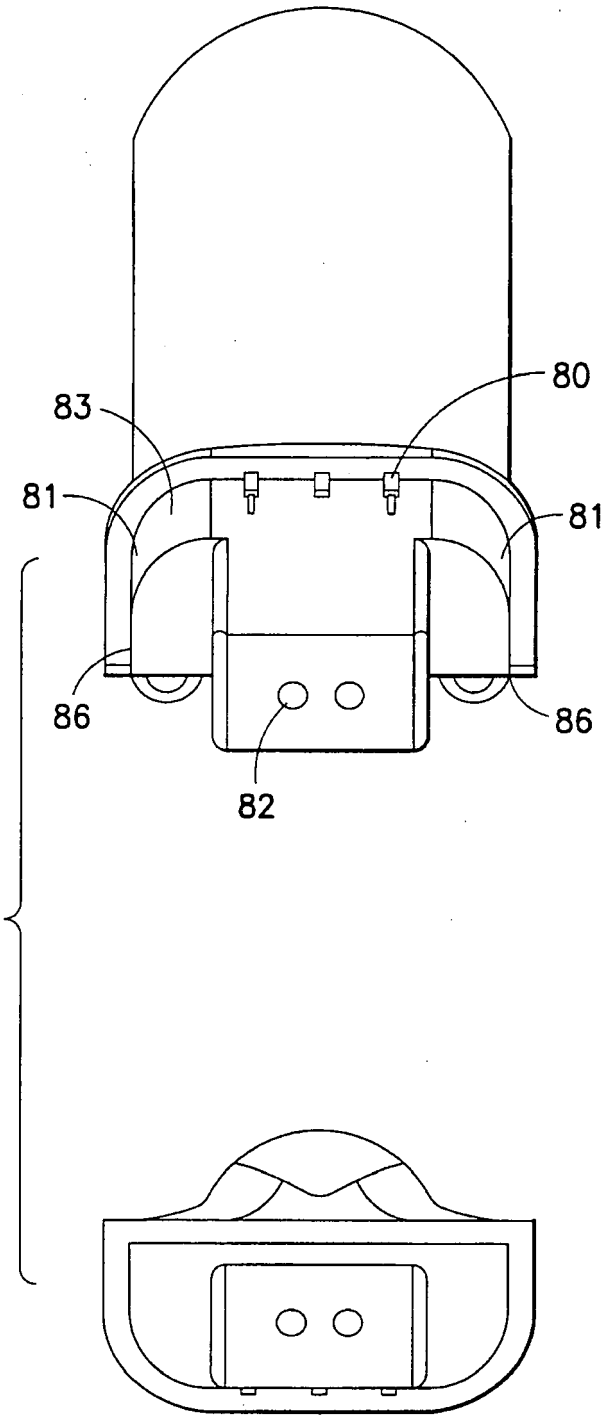

FIG.7A

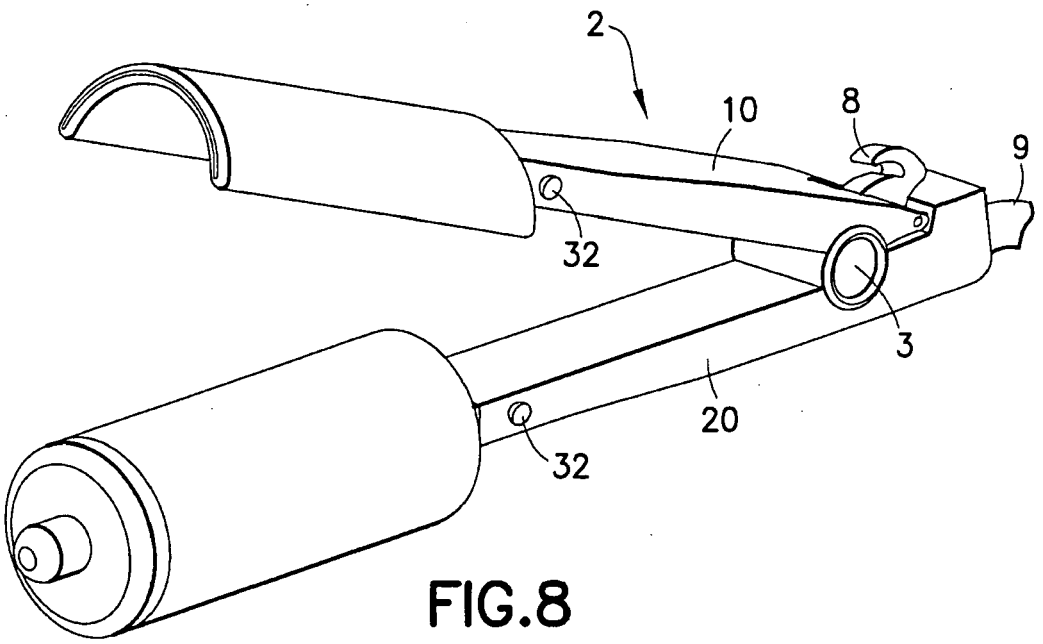

FIG.8

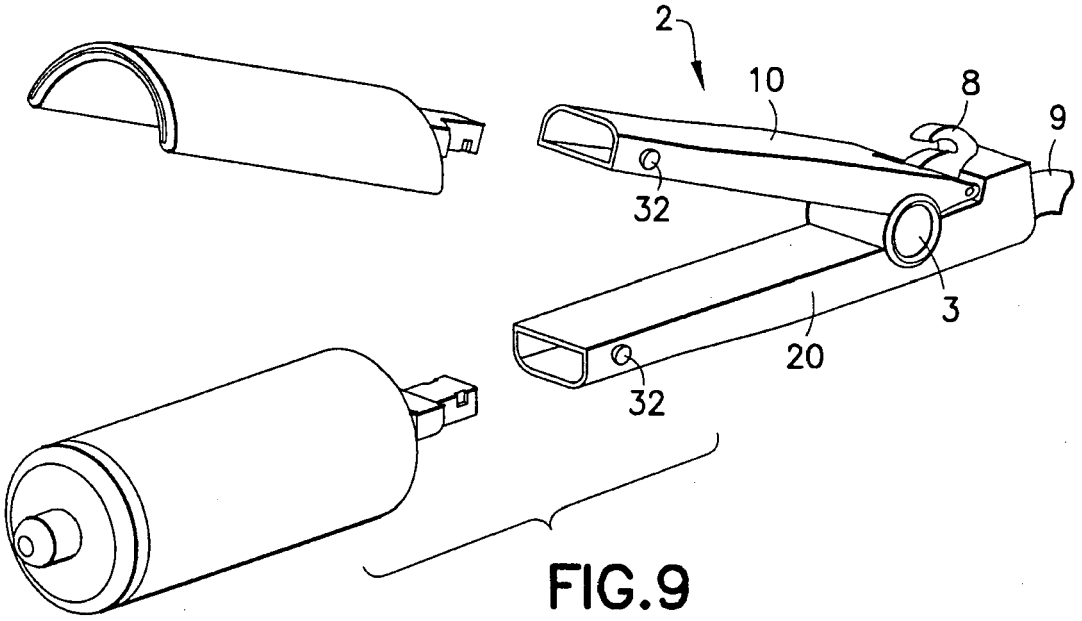

FIG.9

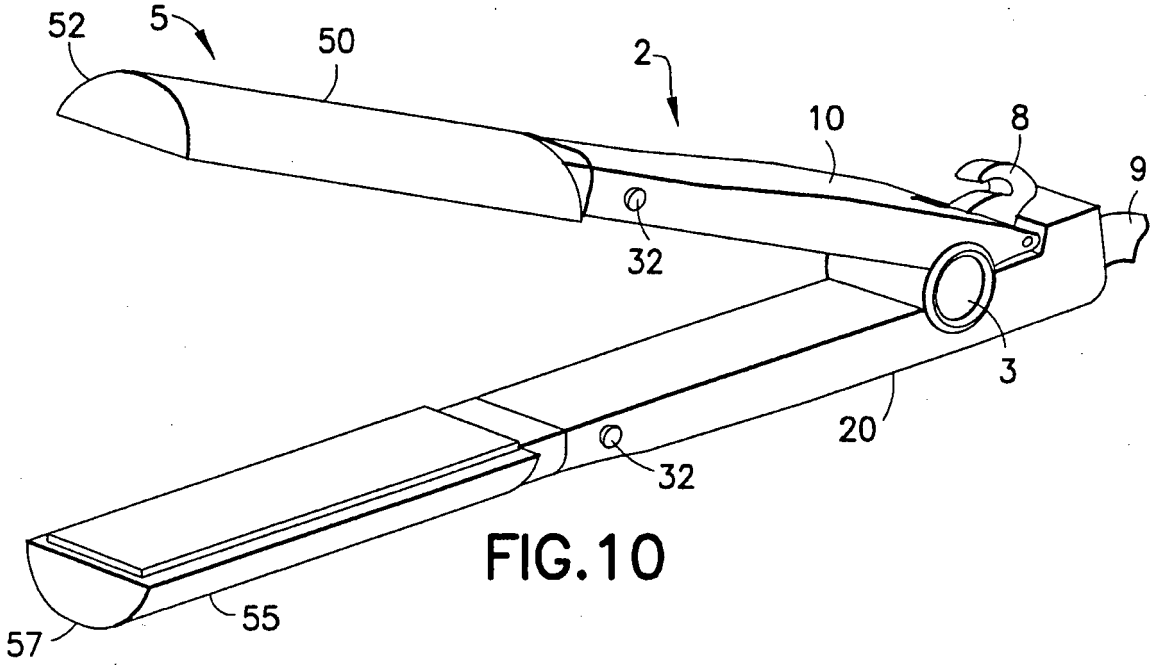
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FIG.10

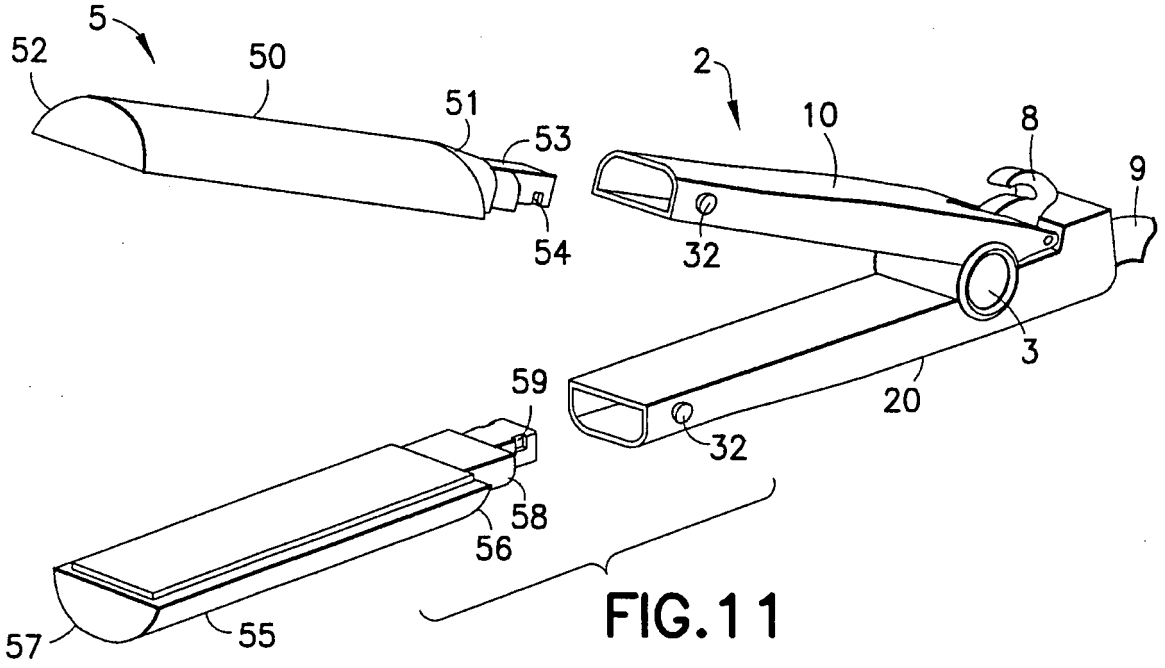
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FIG.11

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EUROPEAN SEARCH REPORT

Application Number
EP 10 01 4348

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Place of search	Date of completion of the search	Examiner
The Hague	9 December 2010	Dinescu, Daniela

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1
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