Title of the Invention: A device for configuring hair extensions
Abstract Title: Clamping device for configuring hair extensions

A device, suitable for configuring hair extensions, comprises a set of jaws for clamping a connector to enable the attaching of hair extensions to hair. The device comprises a portable body (1, figure 1) supporting a pair of jaws 14, one being a moveable jaw 41, and the second 42 being a fixed reference jaw which does not move. The jaws are driven by a rotary motor 8 via a transmission wheel 9.
A DEVICE FOR CONFIGURING HAIR EXTENSIONS

Field of the Invention

5 The present invention relates to device for configuring hair extensions, in particular for attaching hair extensions to hair; more particularly but not exclusively a device for clamping connectors onto hair extensions and hair.

Background

10 Increasing importance on hairstyles in many societies is accompanied by increasing numbers of hair-styling accessories and techniques.

Hair extensions are man-made or natural wefts of hair that are attached to a user's natural hair, so as to create immediate longer or simply different hair.

This technique therefore increases the versatility of hair styling hugely. Hair extensions add thickness, length and colour to natural hair.

20 There are a variety of methods for attaching extensions to hair varying from sewing to clipping in to gluing. In some techniques connectors such as micro rings or small plastic cylinders are bonded to the root of the natural hair. These connectors are convenient as they can be attached to short natural hair and removed easily.

25 Typically such connectors comprise micro-rings or tubes. The connectors vary in resistance, strength, torsional rigidity and material.

This means of configuring extensions is comfortable, long-lasting and flexible; however, takes patience and technique to apply to hair and clamp onto the hair and extensions. In addition the tools used for clamping can be fiddly and manually tiring, wherein on a typical head of hair approximately 300 connectors may be required.

Prior Art

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Accordingly a number of patent applications have been filed in an attempt to resolve the problem or similar, including the following:

Granted United States patent US 8 495 902 (WOTTON) discloses a crimping device comprising: a first jaw having, across its width and extending at least partially along its length, spaced multiple fixed crimp members each configured to provide a deformation on one surface of a crimp tube; a second jaw having, across its width and extending at least partially along its length, spaced multiple fixed crimp members each configured to provide a deformation on an opposite surface of a crimp tube thereby creating a crimp pattern in a crimp tube when the first and second jaws are brought together about the crimp tube; a first handle for the first jaw; and a second handle for the second jaw.

Granted European patent EP 1 587 383 (ARROYO) discloses a process for adding hair or artificial fiber supplements to scalp hair comprising: a. threading one or more flared tubes of a predetermined size and color onto a threading tool with a flared end on the one or more flared tubes towards an enlarged handle on the threading tool, b. capturing a flattened bundle of scalp hair in a hook portion of the threading tool, c. sliding the flared tube along the threading tool and over the hook portion toward the scalp d. releasing the scalp hair bundle from the threading tool leaving the scalp hair extending from the flared end of the tube, e. inserting an attachment end of a hair extension through the flared end of the tube and into a lumen within the tube, f. placing the flared tube between opposed flat parallel faces of upper and lower jaws of a flattening tool and, g. using the flattening tool, applying pressure to the tube, compressing the tube, creating a flattened portion across and along the tube trapping the scalp hair and inserted portion of the hair extension within the crimped tube.

United States patent application US 2 583 625 (BERGAN) discloses a crimping tool comprising two jaws, a pivot connecting the jaws, one jaw provided with a work face having an indentor projecting therefrom and the other jaw provided with a work surface having a recess therein and toward which the indentor approaches intrusion when the jaws approach each other, said work face and work surface intersecting at the axis of the pivot, the bottom of the recess forming in cross section an arc substantially the arc of a circle and approximately symmetrical with respect to a line perpendicular to the plane of said work surface, the sides of the recess adjacent its throat being each substantially straight for at least a portion thereof and said straight
sides being inclined towards each other and towards said perpendicular line, the angle made by the straight portion on the side nearest the pivot forming a greater angle with said perpendicular line than does the straight portion on the side remote from the pivot and the arc of movement of the most advanced part of the indentor being tangent to said perpendicular line adjacent the plane of said work surface.

Summary of the Invention

According to the present invention there is provided a device for configuring hair extensions, comprising a portable body supporting a pair of jaws, wherein at least one of said jaws moves to close the jaws, and at least one of said jaws moves to open the jaws; and wherein the jaws are closed to clamp a connector therebetween.

Typically such connectors comprise micro-rings or tubes. Such connectors have different materials and torsional characteristics. Consequently in some embodiments the jaws advantageously are configured with torsional or pressure control relating to their mutual movement.

In some embodiments the jaws comprise a single moving jaw, a first jaw, which jaw moves towards the other, second, jaw. In this way moving parts may be minimised.

Advantageously in some embodiments the first jaw is configured to move equally along its length towards the second jaw, so as to allow for precise torsion control. In such embodiments the torsion control may be incremented with regards to different connectors.

The jaws comprise elongate members extending from the body to tips, wherein one or both jaws include a face configured for clamping a connector.

Advantageously therefore the jaws are enabled to exert a closing force along their length from tip to body. In this way the device may be used to clamp at a plurality of points on the faces.

Advantageously therefore the jaws may be shaped to accommodate clamping along their length. For example the jaws comprise faces for clamping, which faces are closed together to clamp. Such faces may comprise texture, raised and lowered
sections or plural sections configured to grip connectors and maintain the connectors in place transversely during clamping.

In some embodiments the jaw faces are configured indented to accept transversely curving connector surfaces therebetween, for example wherein the faces comprise indented lowered sections which deepen towards one jaw when the jaws are closed and relatively increasing raised sections which raise towards the other jaw when the jaws are closed.

Such faces may permit acceptance of a circular or oval section connector. The jaws may be configured to provide curvature to a finished connector.

In other embodiments the connectors may be flattened by the jaws, so that the connectors finish with two substantially parallel tines, which tines hold the extension and hair therebetween in use.

In some embodiments the raised and lowered sections provide a repeating pattern, which pattern is repeated throughout the length of the faces. In this way the same types of connectors may be clamped at any point of the jaws.

In some embodiments the raised and lowered sections differ along the length so as to allow for different width or depth connectors.

In some embodiments the raised and lowered sections are configured to provide a trailing or leading edge differential, so as to accommodate a variance therebetween in clamping.

In some embodiments these members taper towards the tips, so as to allow for grip over smaller objects, for example wherein the tips are inserted into a lacuna in the object or wherein the tips are shaped to grip an arcuate surface. In this way the device allows a user to crimp small connectors onto hair extensions.

In addition or the alternative tapered jaws towards the tips allows the user easier manoeuvrability and reduces weight. The tips are ideally rounded.
The jaws provide outers, which outers comprise the surfaces apart from the faces. Such outers may be shaped so as to accommodate connectors. Ideally therefore the outers are curved, for example so as to allow for easier manoeuvrability through hair and reduce weight, and allow for the jaws to be inserted into the lacuna in connectors.

The outers ideally are provided with a smooth or glossy surface so as to avoid snags or otherwise reduced ease of movement through hair.

The body may be provided with a curved exterior such that the exterior is comfortable in the user's hand.

The body may be provided with a smooth or glossy surface so as to avoid snags or otherwise reduced ease of movement through hair.

In some embodiments the device comprises electrically powered movement of the at least one jaw, wherein the jaw or jaws are moved by a motor. Such motor may be powered by battery or by mains electricity. Where a battery is included the battery may be displaceable and/or rechargeable, for example comprises lithium ion.

The body further comprises a control mechanism, which control mechanism acts to control the closing and/or opening of the jaws, wherein in some embodiments the jaws may be biased to close and in some embodiments the jaws may be biased to open. In other embodiments there may be no bias on the jaws.

The mechanism in some embodiments may comprise a manual action for example squeezing. In electric embodiments the mechanism comprises a control interface and a jaw closure mechanism.

In some embodiments such jaw closure mechanism comprises torsion control, wherein the pressure of the jaws' closure may be advantageously monitored or regulated. In this way the jaws may be moved together at a defined pressure and no further, so as to avoid damage to connectors, extensions or hair.
In some embodiments the jaws approximate linearly so as to maintain the faces in an equal opposing relationship throughout approximation, so as to allow for consistent approximation of connectors.

In other embodiments the moving or first jaw is rotated onto the second or reference jaw (which second jaw does not move with reference to the body). In this way the jaws clamp together with progressive variance in jaw face alignment.

**Brief Description of Figures**

Figure 1a shows an exploded isometric view of a first embodiment of the device according to the present invention;

Figures 1b and 1c show isometric views of the first embodiment as shown in Figure 1a;

Figure 2a shows an exploded isometric view of a second embodiment of the device according to the present invention;

Figures 2b and 2c show isometric views of the second embodiment as shown in Figure 2a;

Figure 3a shows an exploded isometric view of a third embodiment of the device according to the present invention;

Figures 3b and 3c show isometric views of the third embodiment as shown in Figure 3a;

Figure 4 shows a reverse exploded isometric view of the second embodiment as shown in figures 2;

Figure 5 shows a reverse exploded isometric view of the third embodiment as shown in figures 3;

and
Figure 6 shows a reverse exploded isometric view of the first embodiment as shown in figures 1.

**Detailed Description of Figures**

With reference to the figures there are shown different body shape embodiments of the device for clamping connectors onto hair and extensions.

In all pictured embodiments the body 1 is held in the user's hand or palm. Consequently the body is ergonomically formed to aid comfort in repeated and longer term usage.

The first jaw comprises a moveable jaw 41 and the second 42 jaw comprises a fixed reference jaw which does not move in use in relation to the body.

The first jaw moves or approximates the second jaw with the body proximate end closing before the body remote part of the jaws; such that the connectors are clamped or pressed together progressively. In this way the connectors are securely mounted on the hair, and there is less likelihood of the extension becoming wholly or partly detached.

The connectors are clamped between the faces 14. The faces comprise repetitively hatched or textured surfaces, wherein the connectors may be clamped at any part along the length of the jaws.

In some embodiments the jaws may comprise faces that are configured for progressive or asymmetric connection to the hair and hair extension, wherein for example a leading or trailing edge of the connector may be clamped tighter.

In the first embodiment the jaws are part of members configured to extend into the body and moveable comprising a linear actuator 13.

In the first embodiment the first jaw is mounted on a slider 43, driven by a laterally extending pin connecting with the slider through a slot 17, the pin extending from the actuator the jaws having bases pivoting in a slot so as to approximate the faces.
The battery 6 is behind the electronics for a more compact form. In the third embodiment the battery is below the electronics for an elongate form for easier holding and manipulation.

In the second embodiment both jaws are mounted on a spindle 46, which spindle supports driving teeth, such that the first jaw is asymmetrically mounted on a cog 45 so as to approximate the faces as the cog turns.

The teeth are driven by a rotary motor 8 which drives a transmission wheel 9.

The body includes a progressively adjustable torsion control and an activation control. The motors are driven by a rechargeable battery 6, recharged through a distal socket 5.

A rotary dial 3 and actuator 15 controls the required torsion. A slider 10 controls activation, wherein an LED 12 indicates activation state.

The jaws intersect at an intersection with the body at a flexible gasket 44, so that the first jaw is enabled to move and the intersection is not prone to ingress, wherein the jaws are biased to closure when not in use.

The faces comprise standardised raised and lowered hatching, such that the jaws provide a sequence of substantially equal or identical clamping points.

The invention has been described by way of examples only and it will be appreciated that variation may be made to the above-mentioned embodiments without departing from the scope of invention. Firstly it will be understood that any features described in relation to any particular embodiment may be featured in combinations with other embodiments.

With respect to the specification therefore, it is to be realised that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.
Therefore, the foregoing is considered as illustrative only of the principles of the invention, with variation and implementation obvious and clear on the basis of either common general knowledge or of expert knowledge in the field concerned. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as set out in the accompanying claims.
Claims

1. A device for configuring hair extensions, comprising a portable body supporting a pair of jaws, wherein at least one of said jaws moves to close the jaws, and at least one of said jaws moves to open the jaws; and wherein the jaws are closed to clamp a connector therebetween.

2. A device according to claim 1 wherein the jaws comprise a single moving jaw, a first jaw, which jaw moves towards the other, second, jaw.

3. A device according to claim 1 or 2 wherein the jaws comprise faces for clamping, which faces comprise texture, raised and lowered sections or plural sections configured to grip connectors and maintain the connectors in place transversely during clamping.

4. A device according to claim 1, 2 or 3 wherein the jaws approximate equally along their length.

5. A device according to any of claims 1 to 4 wherein the jaws are configured with torsional or pressure control relating to their mutual movement.

6. A device according to claim 5 wherein the control comprises incremental settings relatable to connectors.

7. A device substantially as described herein with reference to figures 1 and 6.

8. A device substantially as described herein with reference to figures 2 and 4.

9. A device substantially as described herein with reference to figures 3 and 5.
Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

Worldwide search of patent documents classified in the following areas of the IPC:

A41G

The following online and other databases have been used in the preparation of this search report:

EPODOC, WPI

International Classification:

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