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(54) **MOTORISED HAIR STYLING IRON**

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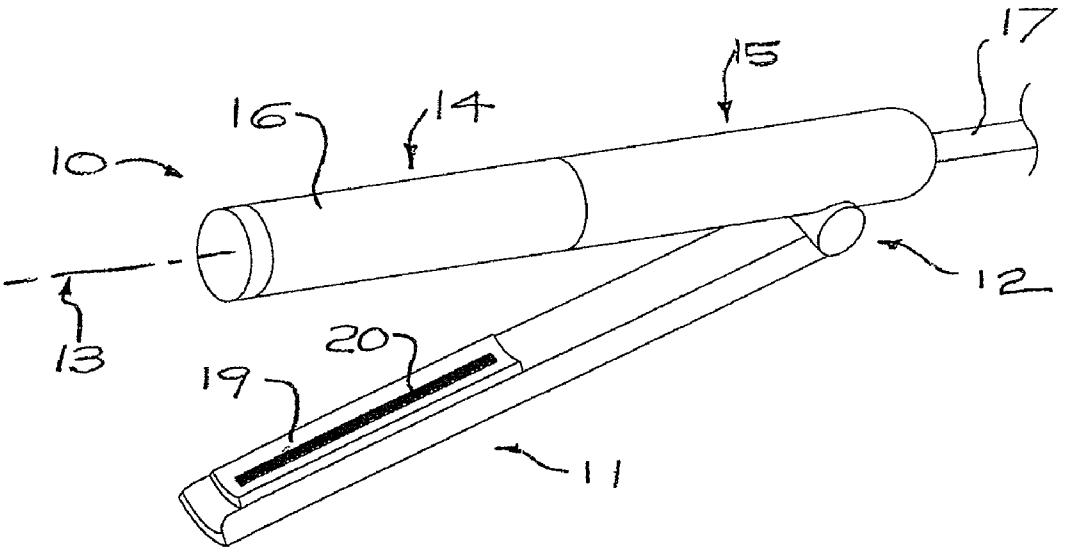
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(57) **ABSTRACT**

A hair styling iron includes a pair of hinged elongate jaws having complementary hair-engaging surfaces configured to hold and engage hair between the surfaces. The iron is motorised for rotating or vibrating at least one of the jaws. At least one elastomeric rib extends along one of the hair-engaging surfaces, and allows the user to readily modulate the hair-gripping force.



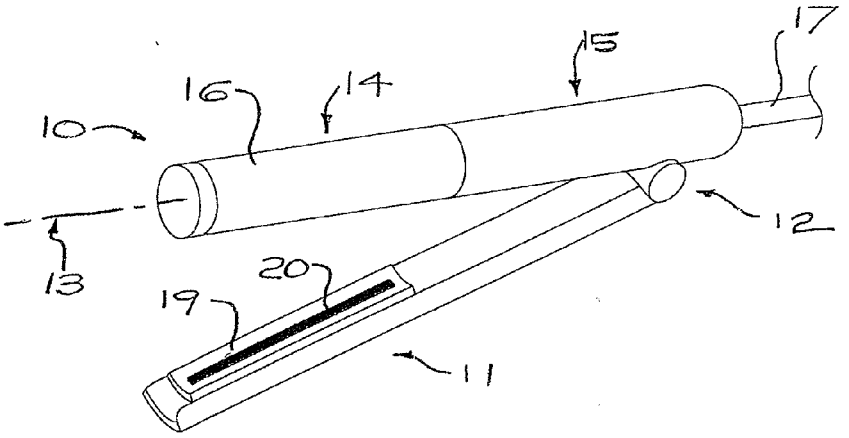


FIG. 1

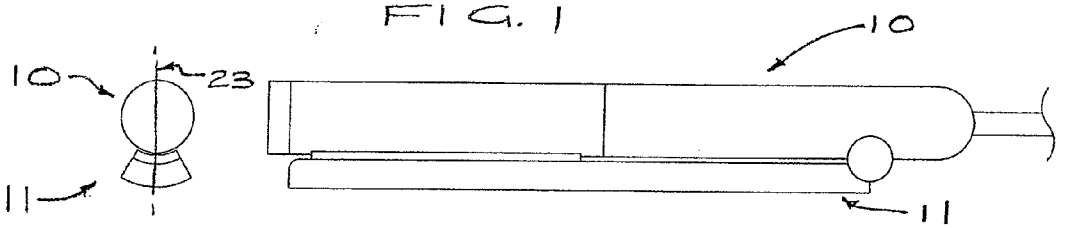


FIG. 2

FIG. 3

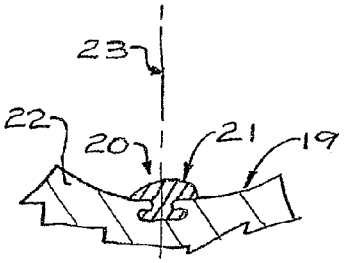


FIG. 4

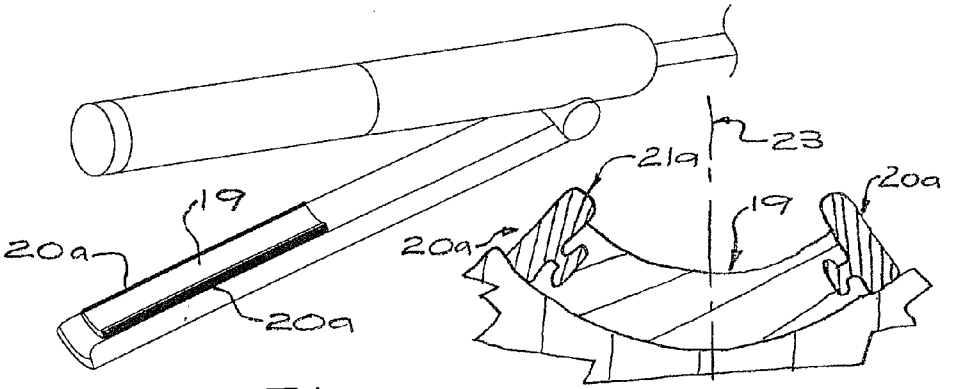


FIG. 5

FIG. 6

MOTORISED HAIR STYLING IRON

TECHNICAL FIELD

[0001] The present invention relates to hair styling irons, particularly electric appliances for hair curling or straightening, having one member motor driven to rotate or vibrate.

BACKGROUND OF THE INVENTION

[0002] One type of known hand-held electric hair curling or straightening iron use two jaws or arms, at least one of which is heated, with the other cooperating to hold hair in contact with the first, and being moveable from an open position allowing the insertion of hair to a closed position to put the hair in contact with the heater.

[0003] Some of the drawbacks with the prior art hair irons are that the processing results can be variable, if the operation is performed too fast, the processing time is too short and, therefore, the hair is not properly formatted, while moving too slowly can damage the hair by overheating. Operation of these irons requires the user to carefully manipulate the two jaws. A new user unfamiliar with the iron may have difficulty in accurately controlling the hair-gripping forces that vary with the clamping pressure between the heating body and hair. As a tool with opposing smooth and hard clamping faces is drawn through the hair any variation in the user's hold on the tool produces a variable contact pressure that can cause discomfort, as the hair is pulled unevenly. The resulting treatment of a lock of hair may also produce an uneven appearance.

[0004] One way in which this issue has been addressed in old hair irons is by providing one of the jaws with a brush or comb for gripping the hair, however such a brush or comb makes the tool less compact and can restrict the manner in which the tool can be used for different operations, such as curling and straightening.

[0005] It will be understood that there is a need to provide a hair styling iron capable of readily being used by new users to achieve hair shaping of good quality, durability, and with uniform appearance throughout the hair, while being easy to use and convenient. The apparatus should capable of ensuring a good thermal transfer between the heated part of the apparatus and hair, while ensuring the protection thereof and with greater reliability in operation. The apparatus should be capable of ensuring a good contact pressure between the means of shaping and hair during treatment. The device should have a simple and compact structure that can be manufactured for a low cost. It is an object of the present invention to address the above needs or more generally to provide an improved electric hair iron.

DISCLOSURE OF THE INVENTION

[0006] According to one aspect of the present invention there is provided a hair styling iron, comprising:

[0007] a pair of elongate jaws, each jaw having proximal and distal parts;

[0008] a hinge connecting the proximal parts of the jaws for movement between a closed position in which the jaws are adjacent for grasping hair therebetween and an open position in which the jaws are spaced apart;

[0009] motorised means for rotating or vibrating at least one of the jaws;

[0010] heating means for heating at least one of the jaws;

[0011] the distal parts of the jaws having complementary hair-engaging surfaces configured to hold and engage hair therebetween, and wherein

[0012] at least one elastomeric rib extends along one of the hair-engaging surfaces.

[0013] The proximal parts may be at longitudinal ends of the jaws or, for instance, at positions intermediate the longitudinal ends.

[0014] Preferably the pair of jaws comprise first and second jaws, the first jaw includes a barrel having a first longitudinal axis and a substantially cylindrical hair-engaging surface,

[0015] the motorised means comprises a rotary motor which rotates the barrel about the first longitudinal axis and wherein

[0016] the one of the hair-engaging surfaces comprises a concave hair-engaging surface formed on the second jaw.

[0017] The at least one elastomeric rib may be disposed to substantially bisect the concave hair-engaging surface. Alternatively, the at least one elastomeric rib may comprise two elastomeric strips disposed adjacent opposing longitudinal edges of the concave hair-engaging surface.

[0018] Preferably the at least one elastomeric rib is linear and extends generally parallel to a longitudinal axis of the jaw on which it is disposed. Optionally the at least one elastomeric rib may be curvilinear.

[0019] Preferably the at least one elastomeric rib is linear and extends substantially parallel to a surface of the barrel in the closed position.

[0020] Preferably the hair-engaging surfaces are metal surfaces, the at least one elastomeric rib has a substantially constant cross-section throughout its length, and protrudes from the one of the hair-engaging surfaces by a substantially constant dimension throughout its length.

[0021] Preferably the at least one elastomeric rib has a convex outer surface protruding from the one of the hair-engaging surfaces. Optionally, the outer surface of the rib may protrude from the one of the hair-engaging surfaces only when the heating portion is at an elevated temperature, due to thermal expansion, and may otherwise be flush or recessed below the one of the hair-engaging surfaces.

[0022] Preferably the convex outer surface of the at least one elastomeric rib has a substantially constant radius of curvature.

[0023] The at least one elastomeric rib may be bonded to the one of the hair-engaging surfaces. Alternatively, the at least one elastomeric rib may be formed on a strip received in an elongate slot in the one of the hair-engaging surfaces.

[0024] Preferably the heating portion has a longitudinally extending plane of symmetry and each elastomeric rib is located substantially symmetrically relative to the plane of symmetry. For instance, where one elastomeric rib is provided it is bisected by the plane, and where two ribs are provided, they may be disposed either side of the plane.

[0025] Preferably the width of the at least one elastomeric rib is between 2% and 20% of the width of the one of the hair-engaging surfaces. Preferably the at least one elastomeric rib has a hardness between 30 Shore A and 50 Shore D. Preferably the at least one elastomeric rib is formed from a silicon rubber.

[0026] Preferably each jaw has an elongate heating portion. Optionally, both elongate heating portions may have substantially the same form with respective at least one elastomeric ribs.

[0027] This invention provides hair iron which is particularly effective in use with the above-described method. The iron may be economically constructed and has an overall simple design which minimizes manufacturing costs and maximizes performance, allowing the user to draw the tool through the hair with a generally constant hair-gripping force.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Preferred forms of the present invention will now be described by way of example with reference to the accompanying drawings, wherein:

[0029] FIG. **1** is a perspective view of a hair styling iron according to a first embodiment of the invention, shown in an open position;

[0030] FIG. **2** is an end view of the iron of FIG. **1** in a closed position;

[0031] FIG. **3** is a side view corresponding to FIG. **2**;

[0032] FIG. **4** is an enlarged fragmentary cross section through the second jaw of the iron of FIG. **1**;

[0033] FIG. **5** is a perspective view of a hair styling iron according to a second embodiment of the invention, shown in an open position, and

[0034] FIG. **6** is an enlarged fragmentary cross section through the second jaw of the iron of FIG. **5**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0035] Referring to the drawings, FIG. **1** illustrates a first embodiment of a hand held electric hair iron having first and second elongate jaws **10**, **11** joined at respective proximal parts disposed near their longitudinal ends by a transverse hinge **12**, shown in an open position. Both jaws **10**, **11** are of hollow construction, with the first jaw **10** including a barrel **14** disposed at its outer end and a coaxial handle section **15** at its inner end. The barrel **14** has a first longitudinal axis **13** and a substantially cylindrical hair-engaging surface **16**.

[0036] In the preferred embodiments illustrated, the barrel **14** is heated by an internally enclosed resistive element (not shown). Further, the barrel **14** is motor-driven to rotate about the longitudinal axis **13**, or to vibrate, either generally omni-directionally or linearly or rotationally along/about an axis. Motorised hair irons having a jaw driven to rotate or vibrate are known from the prior art, and it will be understood that this can be achieved in a number of different ways within the scope of the present invention. Power may be supplied to the heating element and motor via a power cord **17** (shown partially cut away).

[0037] The second jaw **11** has a distal part with a concave hair-engaging surface **19** which is elongate and part-cylindrical. The concave hair-engaging surface **19** is complementary to the surface **16** of the barrel **14**, and with the jaws **10**, **11** closed the hair-engaging surfaces **16**, **19** are adjacent and oppose one another in a generally parallel configuration.

[0038] In the first embodiment of FIGS. **1-3**, an elastomeric rib **20** extends centrally along the concave hair-engaging surface **19** from which it projects. The exposed face **21** of the rib **20** may have a smooth convex form, such as a constant radius of curvature. The elastomeric rib **20** may be located in a linear slot in the plate **22**. A central plane **23** extends longitudinally and bisects the jaws **10**, **11**. The elastomeric rib **20** may be located at the trough of the concave face **19**, such that it is also bisected by the plane **23**. In the embodiment illustrated, the rib **20** protrudes from the concave face by a substantially constant dimension throughout its length (of between 0.1 mm and 1 mm). The longitudinal ends of the rib **20** are spaced apart from the longitudinal ends of the plate **22**.

[0039] The basic structure of the jaws **10**, **11** may be a moulded polymeric construction forming the handle portions **15**, while the barrel **14** and plate **22** are of metal such as chromium steel, and their respective faces **16**, **19** are polished.

[0040] A second embodiment of the second jaw is shown in FIGS. **5** and **6**, in which a pair of parallel, generally coextensive, elastomeric ribs **20***a* are provided, each disposed adjacent opposing longitudinal edges of the hair-engaging surface **19**, such that their exposed faces **21***a* project beyond the surface **19**. The ribs **20***a* are disposed symmetrically on opposing sides of the central plane **23**.

[0041] In preferred embodiments the width of the rib **20**, **20***a* is between 2% and 20% of the width of the concave face **19**, most preferably between 5% and 10% of the width of the face **19**. Ribs **20**, **20***a* of silicon rubber having a hardness of 40 Shore A has been found to provide good performance, but satisfactory performance can be obtained with a hardness between 30 Shore A and 50 Shore D.

[0042] In use, a lock of hair is wound in a loop about the elongate barrel **14**, the user grasping the jaws to clamp the lock of hair between the faces **16**, **19**. In this manner the hair is pressed against the rib(s) **20**, **20***a* while it is softened by the application of heat. The user then draws the iron along the lock of hair to form the hair, and the or each elastomeric rib allows the hair-gripping force to be more readily maintained at a constant level.

[0043] Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the scope thereof.

1. A hair styling iron comprising:
- a pair of elongate jaws, each jaw having proximal and distal parts;
- a hinge connecting the proximal parts of the jaws to each other for movement of the jaws between a closed position, in which the distal parts of the jaws are adjacent for grasping hair, and an open position in which the distal parts of the jaws are spaced apart;
- motorised means for rotating or vibrating at least one of the jaws;
- heating means for heating at least one of the jaws, wherein the distal parts of the jaws have complementary hair-engaging surfaces configured to hold and engage hair between the hair-engaging surfaces, and
  - one of the hair-engaging surfaces includes at least one elastomeric rib extending along the hair-engaging surface.

2. The iron of claim **1**, wherein
- the pair of jaws comprises first and second jaws,
- the first jaw includes a barrel having a first longitudinal axis and a substantially cylindrical hair-engaging surface,
- the motorised means comprises a rotary motor which rotates the barrel about the first longitudinal axis, and
- the hair-engaging surface including at least one elastomeric rib comprises a concave hair-engaging surface on the second jaw.

3. The iron of claim **1**, wherein the at least one elastomeric rib substantially bisects the hair-engaging surface.

4. The iron of claim **1**, wherein the at least one elastomeric rib comprises two elastomeric strips disposed adjacent opposing longitudinal edges of the hair-engaging surface.

5. The iron of claim **2**, wherein the at least one elastomeric rib is linear and extends generally parallel to a longitudinal axis of the jaw on which the at least one elastomeric rib is disposed.

6. The iron of claim **5**, wherein the at least one elastomeric rib extends substantially parallel to a surface of the barrel in the closed position of the jaws.

7. The iron of claim **1**, wherein

the hair-engaging surfaces are metal surfaces, and

the at least one elastomeric rib has a length and a substantially constant cross-section throughout the length, and protrudes from the one of the hair-engaging surfaces including the at least one elastomeric rib by a substantially constant dimension throughout the length.

8. The iron of claim **7**, wherein the substantially constant dimension is between 0.1 mm and 2 mm.

9. The iron of claim **7**, wherein the at least one elastomeric rib has a convex outer surface protruding from the one of the hair-engaging surfaces including the at least one elastomeric rib.

10. The iron of claim **9**, wherein the convex outer surface of the at least one elastomeric rib has a substantially constant radius of curvature.

11. The iron of claim h wherein the at least one elastomeric rib is bonded to the one of the hair-engaging surfaces including the at least one elastomeric rib.

12. The iron of claim **1**, wherein

the one of the hair-engaging surfaces including the at least one elastomeric rib includes an elongate slot and a strip received in the elongate slot, and

the at least one elastomeric rib is located on the strip.

13. The iron of claim **1**, wherein

the heating portion has a longitudinally extending plane of symmetry, and

each elastomeric rib is located substantially symmetrically relative to the plane of symmetry.

14. The iron of claim **1**, wherein the jaws include inner clamping faces and outer convex faces that are polished metal surfaces.

15. The iron of claim **1**, wherein the at least one elastomeric rib has a length that is between 2% and 20% of width of the one of the hair-engaging surfaces including the at least one elastomeric rib.

16. The iron of claim **1**, wherein the at least one elastomeric rib has a hardness between 30 Shore A and 50 Shore D.

17. The iron of claim **1**, wherein the at least one elastomeric rib is silicone rubber.

18. The iron of claim **1**, wherein each jaw has a heating means comprising an elongate heating portion.

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