CURLING IRON AND FLAT IRON THAT DECREASE INJURY DUE TO BURNS

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ABSTRACT
A hair curling iron or a flat hair iron has rows or rings of unheated combs attached to a heated barrel or paddle with a slotted clamp that accepts the rows or rings of combs. The rows or rings of combs provide a buffer between the heated barrel or paddle and the skin or scalp.
CURLING IRON AND FLAT IRON THAT DECREASE INJURY DUE TO BURNS

REFERENCE TO RELATED APPLICATIONS

[0001] This application claims one or more inventions which were disclosed in Provisional Application No. 61/595,332, filed Jan. 21, 2012, entitled “NON-BURNING HAIR CURLING IRON”. The benefit under 35 USC §119(e) of the United States provisional application is hereby claimed, and the aforementioned application is hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The invention pertains to the field of hair irons. More particularly, the invention pertains to curling irons and flat irons that are safer for the user because they decrease the likelihood of burns.

[0004] 2. Description of Related Art

[0005] This relates to hair irons, which have been a staple of women’s hair styling products for years. However, many people have been burnt by the hot barrel of typical curling irons. If the barrel gets too close to the skin, it can cause discomfort or burns because there is no buffer between the heated barrel and the scalp or skin. Quizi, et al. (Academic Emergency Medicine, April, 2001, Volume 8, No. 4, pp. 395-397, herein incorporated by reference), noted that the most common injury resulting from curling irons is thermal burns because “the cylinder containing the heating element is mostly exposed”. They further concluded that “the re-engineering of curling irons” could prevent those injuries.

[0006] Curling irons have a clamp that is pivotally attached at the handle which provides a way to hold the hair while it is being curled and smoothed, but the hair often remains tangled or matted between the barrel and the clamp because there are no combs or brushes to untangle the hair as it is pulled through the curling iron. An additional procedure of first combing or brushing the section of hair needs to be employed by the user, then the user must set down the brush or comb and then pick up the curling iron again, thus taking additional time to style the hair. Hair curling brushes have also been used, but do not have an additional clamp to hold the hair between the barrel and the clamp to create a smooth curl. Because hair curling brushes do not have a clamp, a negative ion coating on the clamp, which would impart smoothness and sheen to the hair, cannot be used.

[0007] U.S. Pat. No. 4,866,249 to Howard (1989) provides for non-heated conductive ribs on the surface of the clamp and on a portion of the surface of the barrel. To use this device, the hair is initially clamped on a flat surface created between the clamp and the barrel, and then takes a sharp turn to start the rest of the curl, which provides a curious type of hairstyle. U.S. Pat. No. D384,439 to Howard (1996) improved on this design and appears to allow for a slightly more rounded curl but with a bump on one side of the curl.

[0008] There are many heated hair brushes on the market, but none that have an attached metal clamp to additionally style and smooth the curl. U.S. Pat. No. 4,257,434 to Wahl (1981) has a barrel with a plurality of comb rings which fit around the heated surface, forming a brush. U.S. Pat. No. 6,070,596 to Altamore (1999) discloses a hair styling device with two legs, each with teeth. The legs nest together in the closed position. U.S. Pat. No. 5,400,810 to Taylor (1995) is a device that can either be a curling iron or used with a separate hair curler. U.S. Patent Application Publication 2005/0022836 to Tong (2005) is a curling iron that has a non-heat transferring plastic cap that is secured at the end of the heated barrel so that the user may touch it without getting burned during the hair styling process.

[0009] Several different inventions claim to prevent burns caused by heated hair styling devices, but are not part of the hair styling device itself. U.S. Patent Application Publication 2011/0214213 to Foreman et al. (2011) offers a protective headgear assembly that acts as a barrier between the hair being styled and the face and neck but is not a part of the heated styling device. U.S. Pat. No. 6,195,806 to Campbell (2001) is an ear protector for use during heated hair curling. U.S. Patent Application Publication 2008/0264439 to Braud (2008) is a headband developed to protect the neck, ears, and forehead from burns during the heated hair curling. None of these devices protect the user from accidental burning of other areas of the body and they appear to be inconvenient and take additional time to style the hair.

SUMMARY OF THE INVENTION

[0010] Hair styling irons, including curling irons and flat irons, use rows or rings of non-heated combs as a buffer between the heated barrel or plate and the skin to prevent burns to the skin.

[0011] In one embodiment, a hair curling iron has rows or rings of unheated combs attached to the heated barrel with a slotted clamp that accepts the rows or rings of combs. The rows or rings of combs provide a buffer between the heated barrel and the skin or scalp.

[0012] In another embodiment, a hair flat iron has vertical or horizontal rows of unheated combs attached to the heated plate with a slotted paddle that accepts the rows of combs. The rows of combs provide a buffer between the heated plate and the skin or scalp.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 shows a perspective view of a hair curling iron in a first embodiment.

[0014] FIG. 2 shows a perspective view of the hair curling iron of FIG. 1.

[0015] FIG. 3 shows a lateral cross-sectional view of a hair curling iron.

[0016] FIG. 4 shows a lateral cross-sectional view of a hair curling iron.

[0017] FIG. 5 shows a perspective view of a hair curling iron in another embodiment.

[0018] FIG. 6 shows a perspective view of the hair curling iron of FIG. 5.

[0019] FIG. 7 shows a lateral cross-sectional view of a hair curling iron.

[0020] FIG. 8 shows a lateral cross-sectional view of a hair curling iron.

[0021] FIG. 9 shows a perspective view of the back of a flat hair iron in another embodiment.

[0022] FIG. 10 is a perspective view of the front of the flat hair iron of FIG. 9.

[0023] FIG. 11 shows a side longitudinal view of the flat hair iron of FIG. 9.

[0024] FIG. 12 shows a side longitudinal view of the flat hair iron of FIG. 9.
The hair styling iron described herein overcome the problems of the prior art by permitting a user to comb the hair during the curling process, while still protecting the user's skin or scalp from burns. Hair styling iron, as described herein, include curling irons and flat irons. In some preferred embodiments, a hair curling iron uses rows or rings of non-heated combs as a buffer between the heated barrel and the skin to prevent burning of the skin. In another preferred embodiment, a flat hair iron includes horizontal or vertical rows of non-heated combs as a buffer between the heated flat iron and the skin.

The irons described herein make it easier for the user to style the hair without putting it down and reaching for a comb or brush and then picking the curling iron back up again. Also, unlike prior art hair styling iron with combs, in the hair styling iron described herein, the hair between the combs with the clamp closed allows the hair to remain combed during the process rather than become matted again.

A hair curling iron includes a body including a plurality of combs and also has a handle. The base of the combs are preferably flush to the body. In one preferred embodiment, single comb teeth protrude through individual holes in the body. In another preferred embodiment, a plurality of connected comb teeth are inserted in a slot along the length or width of the body. In one preferred embodiment, the distance between each comb tooth is between approximately 0.25 and 1.0. The generally elongated cylindrical body is secured at its one end to the handle. The hair curling iron also includes a heating element for heating the elongated cylinder body. A second elongated member, or clamp, is pivotally connected relative to the first elongated member, and has a curved surface that conforms to the curved surface of the cylindrical body when the clamp is closed. The hair curling iron also includes a pivot point or lever for pivoting the clamp towards the elongated cylindrical body to close the clamp and pivoting the clamp away from the elongated cylindrical body to open the clamp. The clamp includes at least one slot through which the combs on the body fit when the clamp is closed over a portion of the body.

In one preferred embodiment, the length of the comb teeth are approximately 0.25", the distance between each comb tooth is between approximately 0.25 and 0.75", and the distance between each comb row or ring is approximately 0.5".

A flat iron includes a plate including a plurality of combs and a handle. The base of the combs are preferably flush to the plate. In one preferred embodiment, single comb teeth protrude through individual holes in the plate. In another preferred embodiment, a plurality of connected comb teeth are inserted into a slot along the length or width of the plate. In one preferred embodiment, the distance between each comb tooth is between approximately 0.25 and 1.0. The generally flat plate or paddle is secured at its one end to the handle. The flat iron also includes a heating element for heating the paddle. A second flat plate, or paddle clamp, is pivotally connected relative to the paddle, such that a surface of the paddle clamp meets the surface of the paddle when the paddle clamp is closed. The flat iron also includes a pivot point or lever for pivoting the paddle clamp towards the paddle to close the paddle clamp and pivoting the paddle clamp away from the paddle to open the paddle clamp. The paddle clamp includes a plurality of slots through which the combs on the paddle fit when the paddle clamp is closed over the paddle.

The curling iron and the flat iron preferably simultaneously comb and detangle hair while it is being curled or straightened, which decreases the amount of time that it takes to detangle and style the hair. The curling iron and flat iron also hold the ends of the hairs securely between the clamp and the barrel before rolling or flattening the hair. In one preferred embodiment, the hair has a sheen provided to it while it is being curled or straightened. The curling iron and flat iron are easy and economical to use and manufacture.

In preferred embodiments for the hair curling iron, the metal clamp covers slightly less than ½ of the barrel and conforms to the cylindrical shape of the barrel. In preferred embodiments, the metal clamp opens to an angle greater than 45 degrees to allow the hair to be positioned along the barrel or paddle.

The clamp does not include any combs or rib-like protrusions extending from a back side (the side not contacting the barrel/paddle) of the clamp. In addition, combs in the hair styling iron described herein are present on the barrel or paddle directly below the clamp.

Either or both the heated barrel and the metal clamp of the curling iron (or the heated plate and the metal paddle clamp for flat hair iron) are preferably coated with a substance which emits negative ions when heated and makes the hair appear smoother, shinier, and healthier. In preferred embodiments, the coating may be by a tourmaline and/or ceramic coating. One example of a specific coating that could be used is disclosed in U.S. Patent Application Publication US2007/0029302 to Russo (2007), herein incorporated by reference, which offers a combination of ceramic and tourmaline coating on hair styling devices which create negative ions when heated.

The hair styling iron described herein create a buffer or barrier between the heated surface and the skin or scalp by providing rows or rings of non-heated combs attached to the heated barrel or paddle. The base of the combs are preferably flush to the heated barrel or paddle. In one preferred embodiment, single comb teeth protrude through individual holes in the heated barrel or paddle. In another preferred embodiment, a plurality of connected comb teeth are inserted into a slot along the length or width of the heated barrel or paddle. An attached metal clip (or clamp) with slots in it accepts the rows or rings of combs. The clip is a heated surface because it is in contact with the barrel or paddle. In preferred embodiments, the clip includes a coating that, when heated, emits negative ions, creating a smooth, shiny appearance to the hair. In one preferred embodiment, the coating is tourmaline and/or a ceramic coating.

The hair styling iron also detangle the hair while it is being styled so that the user does not need to put the curling iron or flat iron down to brush or comb the hair before applying the iron, thus decreasing the time required to style the hair.

Curling Iron

The embodiments shown in FIGS. 1-4 show an embodiment of a hair curling iron. In FIG. 1, the passively heated metal clamp is closed. Each row of comb teeth (or bristles) is positioned longitudinally along the barrel. The base of the comb teeth is preferably flush to the barrel. In the embodiment shown in FIGS. 1-4, the comb teeth are...
connected along a base 119, have been inserted in a slot along the length or width of the barrel 101. In another preferred embodiment, single comb teeth 118 protrude through individual holes in the barrel 101. In one preferred embodiment, the rows 103, 109 of combs 118 are evenly spaced around the barrel 101. In other embodiments, the rows 103, 109 of combs 118 are unevenly spaced. The row 103 of combs positioned along the top 110 of the heated barrel 101 protrudes through the slot 202 in the metal clamp 102 when it is in the closed position. The remaining rows of combs 109 are not covered by the metal clamp 102. Any number of rows of combs may be positioned along the top 110 of the heated barrel 101. In some preferred embodiments, the curling iron 100 includes a 1/2", ¾" or 1" diameter barrel and 5-7 rows. In other preferred embodiments, the curling iron 100 includes a 1 ½" or 2" barrel and 8-12 rows. In preferred embodiments, the number of rows is chosen to best comb the hair. In addition, any number of comb teeth within each row may be utilized. In preferred embodiments, the number of comb teeth within each row is chosen to best comb the hair. In some preferred embodiments, each row 103, 109 of combs is preferably approximately 4"-8" with comb teeth 118 spaced approximately ½"-1" apart. In some preferred embodiments, the number of comb teeth 118 range from 4 to 52 comb teeth 118 per row 103, 109. In some embodiments, each row 103, 109 has the same number of comb teeth 118. In other embodiments, the rows 103, 109 may have different numbers of comb teeth 118. For example, the number of comb teeth 118 may alternate from row to row. As another example, the number of comb teeth 118 in the row 103 below the metal clamp 102 preferably have less comb teeth 118, because there are no comb teeth 118 at the end closest to the handle 105.

The tip 104 at the end 111 of the barrel 101 has no combs and is preferably not heated, to allow the user to more safely handle the curling iron 100. In some preferred embodiments, the tip 104 is made of a nonmetal material, for example plastic or a plastic-like material. The handle 105 contains the on/off switch and the heat settings (not shown). The metal clamp 102 may be held closed by a spring 106 underneath the metal clamp handle 112. A portion of the metal clamp handle 112 may be covered, preferably by a plastic-like material, which does not transmit heat for safer handling.

In some preferred embodiments, either the heated metal barrel 101 or the passively heated metal clamp 102, or both the heated metal barrel 101 and the passively heated metal clamp 102, may be coated in a tourmaline, ceramic or other coating 107 to impart shininess to the hair. The electrical cord 108 extends from the base 113 of the handle 105. The metal clamp 102 attaches to the base 115 of the barrel 101 by means of a fastener 114, for example a pin or screw, at the side of the barrel 101 so that the metal clamp 102 can pivot on it while the metal clamp opens and closes.

FIG. 2 shows the passively heated metal clamp 102 open to allow the hair to be positioned around the barrel 101. The metal clamp 102 has a slot opening 202 that is equal or slightly larger than the length of the top row of combs 103 located on the top 110 of the barrel 101. The spacer length 201 of each comb 118 is chosen to create a buffer between the heated metal barrel 101 and the skin/scalp. In one preferred embodiment, the spacer length 201 of each comb 118 protruding from the barrel 101 is approximately ½ inch. In other preferred embodiments, the spacer length 201 is greater than ½ of an inch. In one preferred embodiment, the spacer length 201 chosen ranges from approximately 1/8"-1/2". As shown in FIGS. 1 and 2, in one preferred embodiment, the row of combs 103 that protrudes through the slot 202 in the metal clamp 102 does not extend to the base 115 of the barrel 101 because the slot 202 does not extend to the base of the metal clamp 102. Similarly, if there are multiple slots in the metal clamp 102, the rows of combs 103 that protrude through the slots 202 will not extend to the base 115 of the barrel.

In one preferred embodiment, the metal clamp 102 covers approximately ½ of the barrel’s 301 diameter.

In one preferred embodiment, the curling iron 100 at mid-barrel 203 with the metal clamp 102 closed. In this example, a smaller diameter barrel 301 (for example a ½", ¾" or 1" diameter barrel) has a single slot 202 on the metal clamp 102 to accept one row of combs 103. In one preferred embodiment, the metal clamp 102 covers approximately ½ of the barrel’s 301 diameter.

In one preferred embodiment, the metal clamp 401 covers approximately ½ of the barrel’s 404 diameter. The number of comb rows on the barrel and slots on the clamp would vary depending on the diameter of the barrel. Some examples of a diameter for the barrel 101 and 404 include, but are not limited to, ½ inch, ¾ inch, 1 inch, ½ inch and 2 inch diameter barrels. In some embodiments, the preferred distance between each row of combs is between approximately ¼" and ½".

The rows of combs 103, 403 are preferably positioned at a slight angle so that when the metal clamp 102, 401 is closed, the slots 202, 402 may need to be sufficiently wide enough to accept unencumbered closure of the metal clamp 102, 401.

In another embodiment, instead of having a single clamp 102, the curling iron may have multiple clamps. In this embodiment, the clamps would each fit between the rows, and be separately hinged so that, when closed, there would be less space between the clamps where the comb row stuck out than if using a clamp on a single hinge.

FIGS. 5-8 show another embodiment of a hair curling iron 500. This embodiment includes rings 522 of combs (comb teeth or bristles) 503 each arranged circumferentially around the barrel 601, but otherwise functions similarly to the curling iron 100 shown in FIGS. 1-4. The base of the comb teeth 503 are preferably flush to the barrel 601. In the embodiment shown in FIGS. 5-8, the comb teeth 503, connected along a base 519, have been inserted in a slot along the length or width of the barrel 601. In another preferred embodiment, single comb teeth 503 protrude through individual holes in the barrel 601. The rings 522 may be spaced evenly along the barrel 601, or unevenly. FIG. 5 shows the curling iron 500 with the metal clamp 502 closed with a few of the combs 503 in each ring 522 protruding through corresponding slots 602 in the metal clamp 502. While seven rings 522 of combs 503 are shown in FIG. 5, other numbers of rings may alternatively be used (for example, see FIG. 6, which has eight rings of combs). In some preferred embodiments, the number of rings may be seven to ten rings, although more or less rings are also possible. In preferred embodiments, the number of rings 522
is chosen to best comb the hair. In addition, any number of comb teeth 503 within each ring 522 may be utilized.

[0047] In preferred embodiments, the number of combs within each ring is chosen to best comb the hair. The number of comb teeth 503 depends on the diameter of the barrel 601. In one preferred embodiment, the comb teeth 503 are spaced preferably 1/4"-1" apart. For smaller diameter barrels (for example, 1/2", 3/4" and 1 inch barrels), there are preferably approximately 5-12 comb teeth 503 per ring 522. For larger diameter barrels (for example 1 1/2 inch and 2 inch barrels), there are preferably approximately 10-20 teeth 503 per ring 522. The number of comb teeth 503 per ring 522 may be the same in each ring 522, or differ from ring 522 to ring 522.

[0048] The combs 503 may be evenly spaced within each ring 522, or unevenly spaced, for example to accommodate the slots 602 and the metal clamp 502. The rings 522 may be evenly spaced along the barrel 601. Alternatively, the rings 522 may be unevenly spaced along the barrel 601.

[0049] The tip 504 at the end of the barrel 511 has no combs 503 and is preferably not heated, to allow the user to more safely handle the curling iron 500. In some preferred embodiments, the tip 504 may be made of a nonmetal material, such as plastic or a plastic-like material. The handle 505 contains the on/off switch and the heat settings (not shown). The metal clamp 502 may be held closed by a spring 506 underneath the metal clamp handle 512. In some preferred embodiments, the metal clamp handle 512 is covered preferably by a plastic-like material, which does not transmit heat for safer handling.

[0050] In some preferred embodiments, either the heated metal barrel 601 or the passively heated metal clamp 502, or both the heated metal barrel 601 and the passively heated metal clamp 502, may be coated in a tournaline, ceramic or other coating 507 to impart shininess to the hair. The electrical cord 508 extends from the base 513 of the handle 505. The metal clamp 502 attaches to the base 515 of the barrel 601 by means of a fastener 514, for example a pin or screw, at the side of the barrel 601 so that the metal clamp 502 can pivot on it while the metal clamp opens and closes.

[0051] FIG. 6 shows the metal clamp 502 opened to allow the hair to be positioned around the barrel 601. The slots 602 are positioned to accept the rings 522 of combs 503 on the barrel 601. The spacer length 516 of each comb 503 is chosen to create a buffer between the heated metal barrel 601 and the skin/scalp. In one preferred embodiment, the spacer length 516 of each comb 503 protruding from the barrel 601 is preferably 1/4 inch. In other preferred embodiments, the spacer length 516 is greater than 1/8 inch. In other preferred embodiments, the spacer length 516 chosen ranges from approximately 1/16" to 1/8". As shown in FIGS. 5 and 6, the ring 522 of combs 503 closest to the handle 505 does not extend all the way around the barrel 601 because the metal clamp 502 does not have a slot 602 at its bottom end.

[0052] FIGS. 7 and 8 show different diameter barrels 704 and 804 that permit different numbers of combs 503 in each ring 522 to protrude through the slots 701, 801. FIG. 7 shows the curling iron 500 midway 603 down the barrel with the metal clamp 702 closed. In this example, a smaller diameter barrel 704 (for example, a barrel with a 1 1/2 inch or 2 inch diameter) has two slots 701 on the metal clamp 702 to accept multiple combs 503 in a single ring 522. In one preferred embodiment, the metal clamp 702 covers approximately 1/2 of the barrel's 704 diameter.

[0053] FIG. 8 shows the curling iron 500 midway 603 down the barrel 804 with the metal clamp 802 closed. In this example, a larger diameter barrel 804 (for example, a barrel with a 1 1/2 inch or 2 inch diameter) has three slots 801 on a large metal clamp 802 to accept multiple combs 503 in a single ring 522. In one preferred embodiment, the metal clamp 802 covers approximately 1/2 of the barrel's 804 diameter.

[0054] While two slots 701 or three slots 801 are shown in these figures, additional slots 701, 801 accepting additional combs 503 from each ring 522 are within the spirit of the invention. The slots 701, 801 may also be of varying length to each accommodate one or more of the combs 503 of each ring. In addition, while two combs 503 protrude through each of the slots in FIGS. 7 and 8, depending upon the size of the slots 701, 801 and the spacing of the combs 503, more or less than two combs may protrude from each slot 701, 801.

[0055] The number of comb rings on the barrel and slots on the clamp would vary depending on the diameter of the barrel. Some examples of a diameter for the barrel 601, 704, 804 include, but are not limited to, 1/2 inch, 3/4 inch, 1 inch, 1 1/2 inch and 2 inch diameter barrels. In some embodiments, the preferred distance between each ring of combs is between approximately 1/8" and 1". In some embodiments, the preferred distance between each comb tooth within a ring is between approximately 1/4" and 1".

[0056] In an alternative embodiment, instead of having multiple slots 701, 801 for each ring of combs 501, the metal clamp includes a single slot 602, 701, 801 that is sized to accommodate the combs 503 that are located below the metal clamp.

[0057] Operation of the Curling Irons

[0058] The curling irons 100 and 500 operate similarly, with the only difference being the configurations of the rows 103, 109 and rings 522 of combs 503. The operation is described here with reference to curling iron 100. The curling iron 100, 500 is plugged in and turned on. When the barrel 101 is sufficiently heated, the user may comb the hair with the combs 103, 109 while the metal clamp 102 is closed. In some preferred embodiments, the combs 103, 109 are preferably made of a plastic-like substance that does not melt, deform or conduct heat when exposed to high temperatures. The user may choose to first comb the hair with the curling iron 100 with the metal clamp 102 in the closed position. Then, the user would open the metal clamp 102, which is passively heated through contact with the barrel 101, and place a section of hair between the barrel and the metal clamp 102.

[0059] The barrel 101 may be placed close to the scalp because the combs 103, 109 act as spacers or buffers 201 between the heated barrel 101 and the scalp or skin. The user may also touch the combs 103, 109 because they may be preferably made of a plastic-like substance that does not melt, deform, or conduct heat when exposed to high temperatures. The user may also touch the tip 104 of the barrel 101 to aid in the styling process because it may also be made of a plastic-like material that does not melt, deform, or conduct heat when exposed to high temperatures. The user then closes the passively heated metal clamp 102 by releasing the clamp handle 112 and pulls the hair positioned between the clamp and the barrel to the end of the hair shaft or to the length desired, allowing the hair to be combed and untangled again during the process. The user then rolls the hair up as close to the scalp as desired to create the curl. The combs may keep the hair untangled during this process and may also allow the user to use the hair curling iron for combing and separating each section of hair to prepare for the next curl. In preferred
embodiments, the coating 107 on the barrel and metal clamp allow the hair to be negatively ionized on both sides of the hair shaft to impart a shine. When the hair is positioned between the metal clamp 102 and the barrel 101 and unangled by the combs 103, 109, the hair may be simultaneously combed, smoothed, shined, and curled without touching the barrel directly to the skin or scalp.

Flat Iron

[0060] FIGS. 9 and 10 show a flat hair iron 900 with a handle 901 and a paddle 902. The handle 901 and the back 905 of the paddle 902 are preferably not heated. The handle 901 contains the on/off switch and heat settings (not shown). The electrical cord 903 extends from the base of the handle 901.

[0061] FIG. 10 shows the paddle clamp 1001 closed with longitudinally arranged rows of combs 1003 protruding through the slots 1002 of the paddle clamp 1001. Although three longitudinally arranged rows of combs 1003 are shown in FIG. 10, in other embodiments, there are preferably two to eight or more rows. While FIG. 10 shows 20 combs 1003 in each row, in other embodiments, there are preferably ten to thirty combs 1003 in each row. In one preferred embodiment, the comb teeth 1003 are spaced preferably ¼"-1" apart. In some embodiments, each row of combs 1003 has the same number of combs 1003. In other embodiments, the rows may have different numbers of combs 1003. For example, the number of combs 1003 may alternate from row to row. The paddle clamp 1001 attaches to the handle 901 by means of a fastener 1004, for example a pin or screw, at the side of the handle 901 so that the paddle clamp 1001 can pivot on the fastener while the paddle clamp handle 1005 opens and closes.

[0062] FIG. 11 shows the flat hair iron 900 with the paddle clamp 1001 closed. The rows of combs (comb teeth or bristles) 1003 protrude through the slots 1002 of the paddle clamp 1001. The spacer length 1102 of each comb 1003 is chosen to create a buffer between the heated plate 1103 and the skin/scalp. In one preferred embodiment, the spacer length 1102 is at least ¼" in length. In other preferred embodiments, the spacer length 1102 is between ¼" and approximately ½" in length. At least one or any combination of the rows of combs 1003, the paddle clamp handle covering 1101, the paddle 902, and the handle 901, may be made of a plastic-like material which does not melt, deform, or conduct heat for safer handling. In a preferred embodiment, the paddle clamp 1001 is held closed by a spring 1104 located between the paddle clamp handle 1005 and the handle 901. In some preferred embodiments, either or both of the heated plate 1103 and the passively heated paddle clamp 1001 may be coated with a tournamile, ceramic or other coating 107 which when heated may excite negative ions to impart a sheen to the hair.

[0063] FIG. 12 shows the flat hair iron 900 with the paddle clamp 1001 open to allow the hair to be positioned between the heated plate 1103 located on the paddle 902 and the paddle clamp 1001. The paddle clamp 1001 has a plurality of slot openings 1007 that are equal to or slightly larger than the rows of combs 1003. In one preferred embodiment, the length 1102 of each comb 1003 is preferably greater than ⅛ inch.

[0064] FIG. 13 shows a lateral cross-sectional view across the paddle 902 and paddle clamp 1001 midway 1201 down the paddle 902 with the paddle clamp 1001 in the closed position, with rows of combs 1003 protruding through the slots 1002 of the paddle clamp 1001. The base of the combs 1003 are preferably flush to the paddle 902. In the embodiments shown in FIGS. 9-13 and FIG. 14, single comb teeth 1003 protrude through individual holes in the paddle 902. In another preferred embodiment, the comb teeth 1003, connected along a base, are inserted in a slot along the length or width of the paddle 902. As the paddle clamp 1001 touches the heated plate 1103, the paddle clamp 1001 is passively heated. The user’s skin/scalp is protected because the combs 1003 protrude through the slots 1007, preferably at least ¼ inches (space length 1102) and provide a buffer between the skin and the heated plate 1103. The width 1301 of the slot opening is also shown in FIG. 13. The width 1302 of the slot opening is preferably chosen to permit the combs 1003 in each row to protrude through the slot opening. In some preferred embodiments, the width of the paddle 902 is between approximately ⅛" and 1". In other preferred embodiments, the distance between the vertical rows of combs 1003 is preferably between approximately ½" and 1". The user is additionally protected because any or all of the rows of combs 1003, the paddle clamp handle covering 1101, the paddle 902, and the handle 901 may be of a plastic-like material which does not melt, deform, or conduct heat for safer handling.

[0065] FIG. 14 shows another embodiment for a flat hair iron 1400. Unlike the vertical rows of combs 1003 shown in FIGS. 9-13, in this embodiment, the rows of combs 1402 are horizontal. The horizontally arranged rows of combs 1402 protrude through horizontally arranged slots 1401 in the paddle clamp 1001. Although eight horizontally arranged rows of combs 1402 are shown in FIG. 14, in other embodiments, there are preferably four to twelve or more rows. While FIG. 14 shows nine or ten combs 1402 in each row, in other embodiments, there are preferably six to sixteen combs 1003 in each row. In some embodiments, each row of combs 1402 has the same number of combs 1402. In other embodiments, the rows may have different numbers of combs 1402 (as shown in FIG. 14). For example, the number of combs 1402 may alternate from row to row. In some preferred embodiments, the width of the paddle 902 is between approximately ⅛" and 3" wide. In other preferred embodiments, the distance between the horizontal rows of combs 1402 is preferably between approximately ⅛" and ⅜".

[0066] In another embodiment, instead of having a single paddle clamp 1003, the flat iron may have multiple clamps. In this embodiment, the clamps would each fit between the vertical or horizontal rows, and be separately hinged so that, when closed, there would be less space between the clamps where the comb row stuck out than if using a clamp on a single hinge.

[0067] Operation of the Flat Hair Iron

[0068] The flat hair irons 900 and 1400 operate similarly, with the only difference being the configurations of the rows 1003, 1402 of combs. The operation is described here with reference to flat hair iron 900.

[0069] The flat hair iron 900 is first plugged in and turned on to the desired heat setting. The user may comb the hair with the combs 1003 while the paddle clamp 1001 is closed. The user then opens the paddle clamp 1001 by pressing the paddle clamp handle 1005, which is passively heated through contact with the heated plate 1103, and allows a section of hair to be placed between the heated plate 1103 and the paddle clamp 1001. With the paddle clamp 1001 closed, the user is protected from any heating elements because the rows of combs 1003, the paddle clamp handle covering 1101, the paddle 902
and the handle 901 are preferably made of a plastic-like material which does not melt, deform or conduct heat for safer handling.

[0070] The combs 1003 protrude through the slots 1002 on the paddle clamp 1001 and act as spacers or buffers between the heated plate 1103 and the passively heated paddle clamp 1001. The user then closes the passively heated paddle clamp 1001 by releasing the paddle clamp handle 1005 and pulls the hair positioned between the paddle clamp 1001 and the heated plate 1103 to the end of the hair shaft. This allows the hair to be combed, untangled, and flattened simultaneously during the process. The user repeats this process with another section of hair. In preferred embodiments, the coating 107 on the paddle clamp and heated plate allows the hair to be negatively ionized on both sides of the hair shaft to impart a shine.

[0071] The hair may be simultaneously combed, untangled, shined, and flattened with the flat irons 900 and 1400 described herein. In addition, the user can style the hair without putting the flat iron down to reach for an additional brush or comb to untangle and arrange the hair. The non-burning flat iron also allows the user to more efficiently style the hair, thus shortening the styling process and improving the ease of use.

[0072] Accordingly, it is to be understood that the embodiments of the invention herein described are merely illustrative of the application of the principles of the invention. Reference herein to details of the illustrated embodiments is not intended to limit the scope of the claims, which themselves recite those features regarded as essential to the invention.

1. A hair styling iron comprising:
   a) a hair styling iron body;
   b) a plurality of non-heated combs protruding from the hair styling iron body;
   c) a heating element that heats the hair styling iron body;
   d) a non-heated handle connected to the hair styling iron body; and
   e) a non-heated clamp pivotally connected to the hair styling iron body comprising a clamp body having an open position and a closed position and at least one slot for receiving at least one of the combs when the clamp is in the closed position, wherein the clamp body is located and shaped such that the clamp body directly contacts and conforms to a surface of the hair styling iron body when the clamp is in the closed position.

2-3. (canceled)

4. The hair styling iron of claim 1, wherein the plurality of combs are positioned perpendicular to a top of the non-heated handle such that the combs create a plurality of vertical rows along the hair styling iron body.

5. The hair styling iron of claim 1, wherein the plurality of combs are positioned parallel to a top of the non-heated handle such that the combs create a plurality of horizontal rows or rings along the hair styling iron body.

6. The hair styling iron of claim 1, wherein the hair styling iron is a curling iron, wherein the hair styling iron body comprises a cylindrical barrel, and wherein the combs are spaced around a circumference of the cylindrical barrel.

7. The hair styling iron of claim 1, wherein the clamp further comprises a clamp handle that pivots the clamp body into the open position and the closed position.

8. The hair styling iron of claim 1, wherein the hair styling iron is a flat iron and wherein the hair styling iron body comprises a flat paddle such that the combs are located on a flat surface of the paddle and the clamp body comprises a paddle clamp.

9. The hair styling iron of claim 1, wherein the clamp body comprises a plurality of vertical slots.

10. The hair styling iron of claim 1, wherein the clamp body comprises a plurality of horizontal slots.

11. The hair styling iron of claim 1, wherein the combs include combs that are directly below the clamp body when the clamp body is in the open position and extend through the slots in the clamp body when the clamp body is in the closed position.

12. The hair styling iron of claim 1, further comprising a coating on a surface selected from the group consisting of a surface of the hair styling iron body, a surface of the clamp body, and both the surface of the hair styling iron body and the surface of the clamp body, wherein the coating emits negative ions when heated.

13. A hair curling iron, comprising:
   a) a cylindrical barrel;
   b) a plurality of non-heated combs arranged in vertical rows or horizontal rings along the cylindrical barrel;
   c) a heating element that heats the cylindrical barrel;
   d) a non-heated handle connected to the cylindrical barrel; and
   e) a non-heated clamp comprising a clamp body having a curved surface, an open position and a closed position at least one slot arranged to accept the rows or rings of combs arranged on the cylindrical barrel when the non-heated clamp is in the closed position, wherein the clamp is located such that the curved surface of the clamp body conforms to a surface of the cylindrical barrel when the clamp is in the closed position.

14. The hair curling iron of claim 13, wherein the clamp body comprises a plurality of vertical slots.

15. The hair curling iron of claim 13, wherein the clamp body comprises a plurality of horizontal slots.

16. The hair curling iron of claim 13, wherein the combs include combs that are directly below the clamp body when the clamp body is in the open position and extend through the slots in the clamp body when the clamp body is in the closed position.

17. The hair curling iron of claim 13, further comprising a coating on at least one surface selected from the group consisting of a surface of the cylindrical barrel, a surface of the clamp body, and both the surface of the cylindrical barrel and the surface of the clamp body, wherein the coating emits negative ions when heated.

18. A flat iron, comprising:
   a) a paddle comprising a heated plate and a plurality of non-heated combs arranged in vertical rows or horizontal rows along a first flat surface of the heated plate;
   b) a heating element that heats the heated plate;
   c) a non-heated handle connected to the paddle; and
   d) a non-heated paddle clamp comprising a paddle clamp body having an open position and a closed position, and comprising at least one slot arranged to accept the rows of combs arranged on the heated plate when the non-heated paddle clamp is in the closed position, wherein the paddle clamp body has a second flat surface and the paddle clamp is located such that the second flat surface of the paddle clamp body contacts the first flat surface of the heated plate when the paddle clamp is in the closed position.
19. The flat iron of claim 18, wherein the paddle clamp body comprises a plurality of vertical slots that accept the combs arranged on the heated plate such that all of the combs arranged on the heated plate protrude through the paddle clamp body when the paddle clamp is in the closed position.

20. The flat iron of claim 18, wherein the paddle clamp body comprises a plurality of horizontal slots that accept the combs arranged on the heated plate such that all of the combs arranged on the heated plate protrude through the paddle clamp body when the paddle clamp is in the closed position.

21. The flat iron of claim 18, wherein the combs include combs that are directly below the clamp body when the clamp body is in the open position and extend through the slots in the clamp body when the clamp body is in the closed position.

22. The flat iron of claim 18, further comprising a coating on at least one surface selected from the group consisting of the first flat surface, the second flat surface, and both the first flat surface and the second flat surface, wherein the coating emits negative ions when heated.

23. A method of styling hair, comprising the step of simultaneously combing and either straightening or curling hair while protecting skin and scalp from burns using a single hair styling iron comprising:

   a) a hair styling iron body;
   b) a plurality of non-heated combs protruding from the hair styling iron body;
   c) a heating element that heats the hair styling iron body;
   d) a non-heated handle connected to the hair styling iron body; and
   e) a non-heated clamp pivotally connected to the hair styling iron body comprising a clamp body having an open position and a closed position and at least one slot for receiving at least one of the combs when the clamp is in the closed position, wherein the clamp body is located and shaped such that the clamp body directly contacts and conforms to a surface of the hair styling iron body when the clamp is in the closed position.

24. The hair curling iron of claim 13, wherein the combs are spaced around a circumference of the cylindrical barrel.

25. The method of claim 23, wherein the hair styling iron is a curling iron, wherein the hair styling iron body comprises a cylindrical barrel, and wherein the combs are spaced around a circumference of the cylindrical barrel.

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