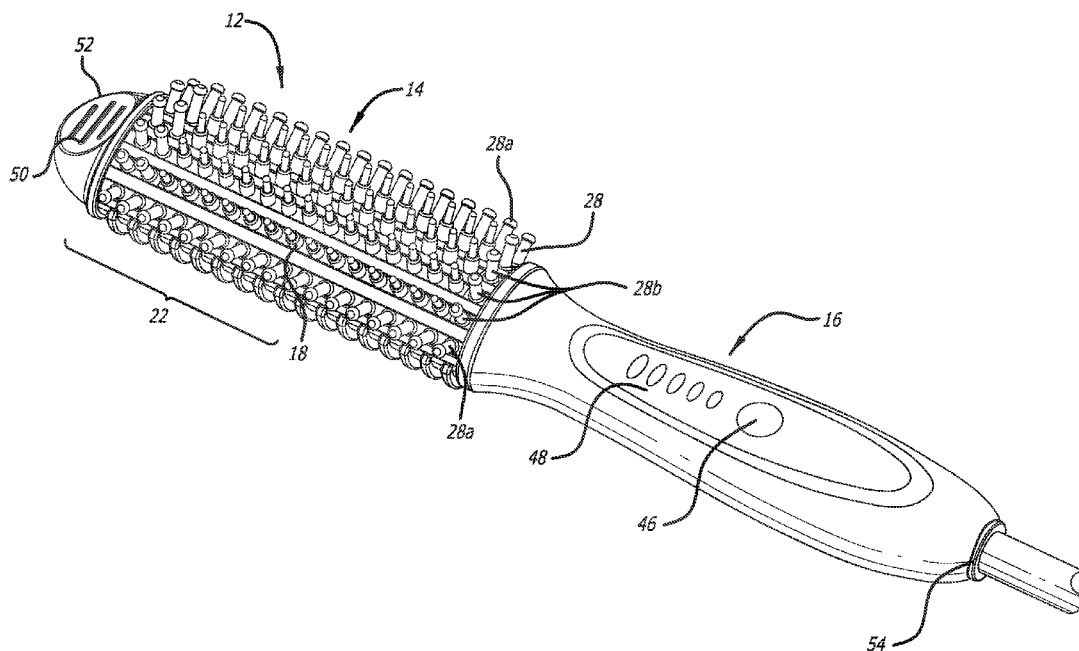




US 20170112271A1

(19) **United States**(12) **Patent Application Publication**
Gulamani(10) **Pub. No.: US 2017/0112271 A1**(43) **Pub. Date: Apr. 27, 2017**(54) **STYLING BRUSH***A46B 15/00* (2006.01)*A46B 7/04* (2006.01)(71) Applicant: **AG Global Products, LLC**, Sherman
Oaks, CA (US)(52) **U.S. Cl.**CPC *A46B 9/023* (2013.01); *A46B 7/044*
(2013.01); *A45D 20/48* (2013.01); *A46B*
15/003 (2013.01); *A46B 9/026* (2013.01)(72) Inventor: **Shauky Gulamani**, Encino, CA (US)(21) Appl. No.: **15/345,372**(22) Filed: **Nov. 7, 2016**(57) **ABSTRACT****Related U.S. Application Data**(63) Continuation-in-part of application No. 29/556,335,
filed on Feb. 29, 2016, which is a continuation-in-part
of application No. 29/498,594, filed on Aug. 5, 2014,
now Pat. No. Des. 755,527, which is a continuation-
in-part of application No. 29/498,472, filed on Aug. 4,
2014, now Pat. No. Des. 750,384.(60) Provisional application No. 62/251,635, filed on Nov.
5, 2015.**Publication Classification**(51) **Int. Cl.***A46B 9/02* (2006.01)*A45D 20/48* (2006.01)

The disclosure provides for a heated hairbrush, said heated hairbrush comprising a first side of a base, a second side of a base, a tapered end, and a handle. The first side of the base provides for at least one set of projections and a heated surface. The heated surface can be located directly on the first side of the base or on an additional plate that is placed on top of the first side of the base. The projections can align into rows and columns on the first side of the base. The projections may extend from a plate or plurality of extensions. The second side of the base may include ridges that span the latitudinal axis of the base. The ridges can also align with the columns defined by the projections. The second side of the base can also comprise a heated surface which can heat an inner portion of the ridges.



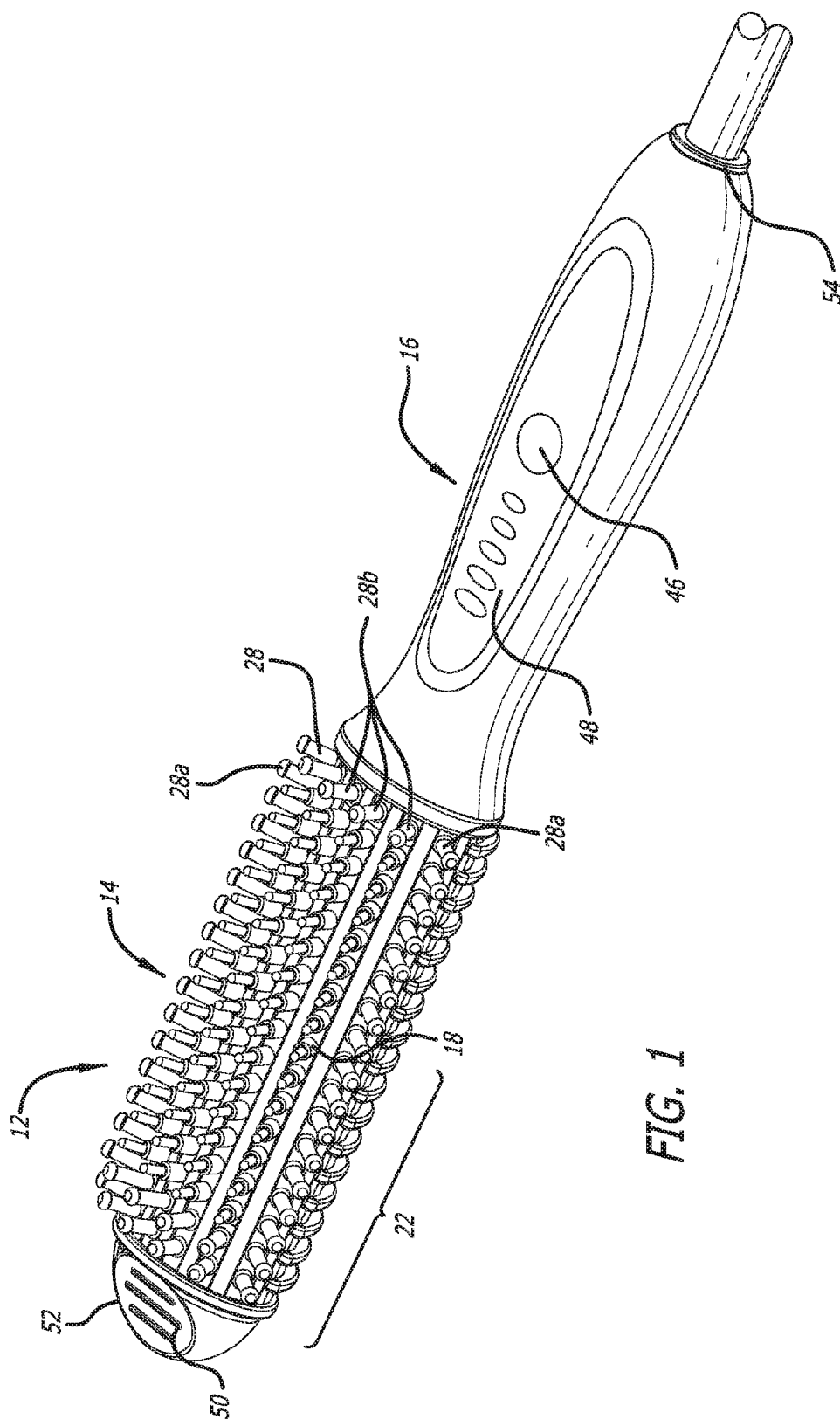
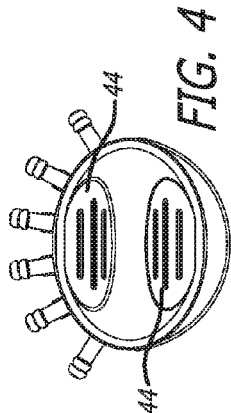
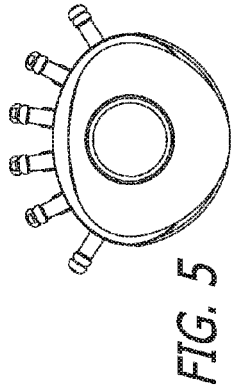
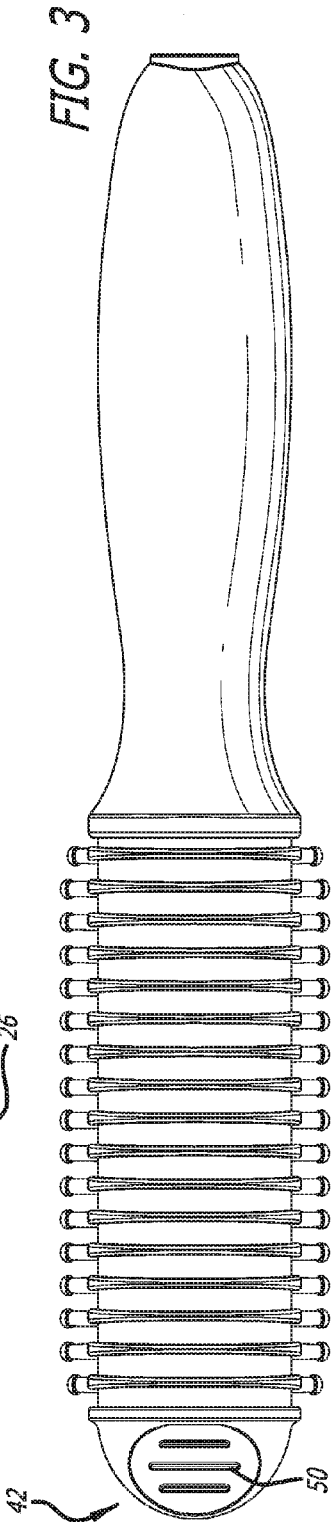
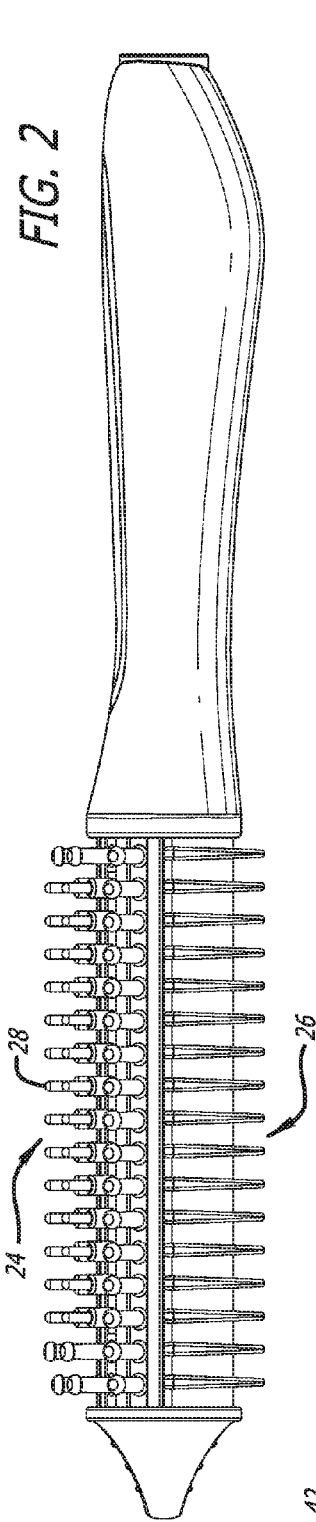
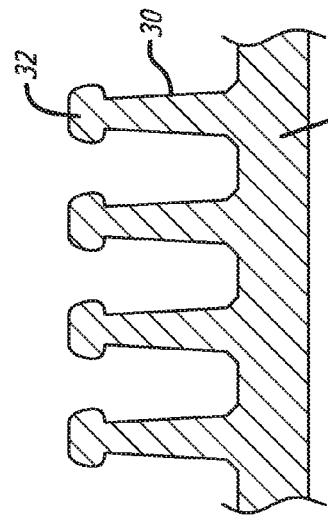
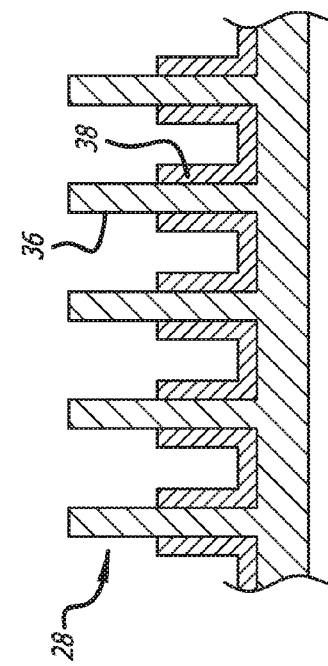
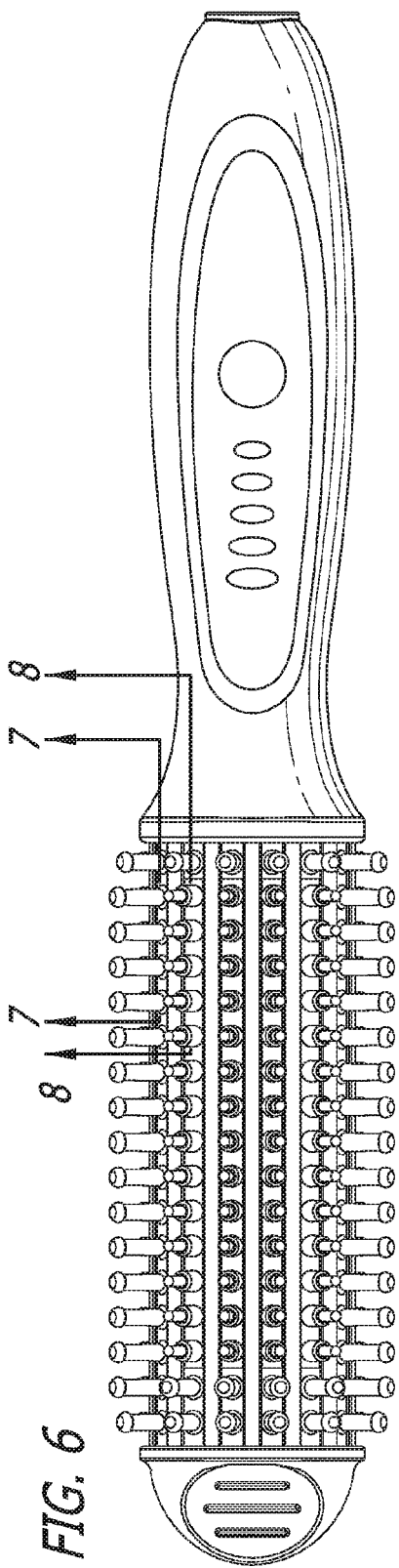
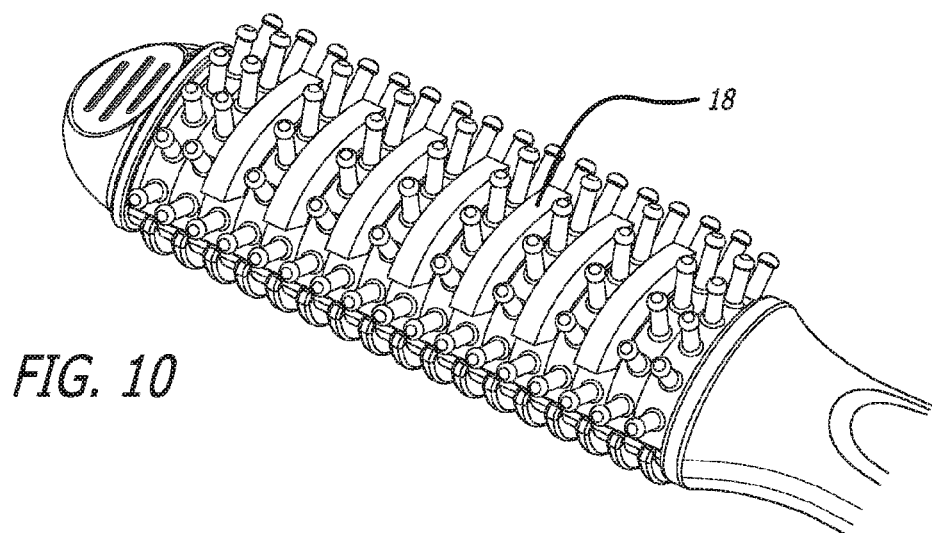
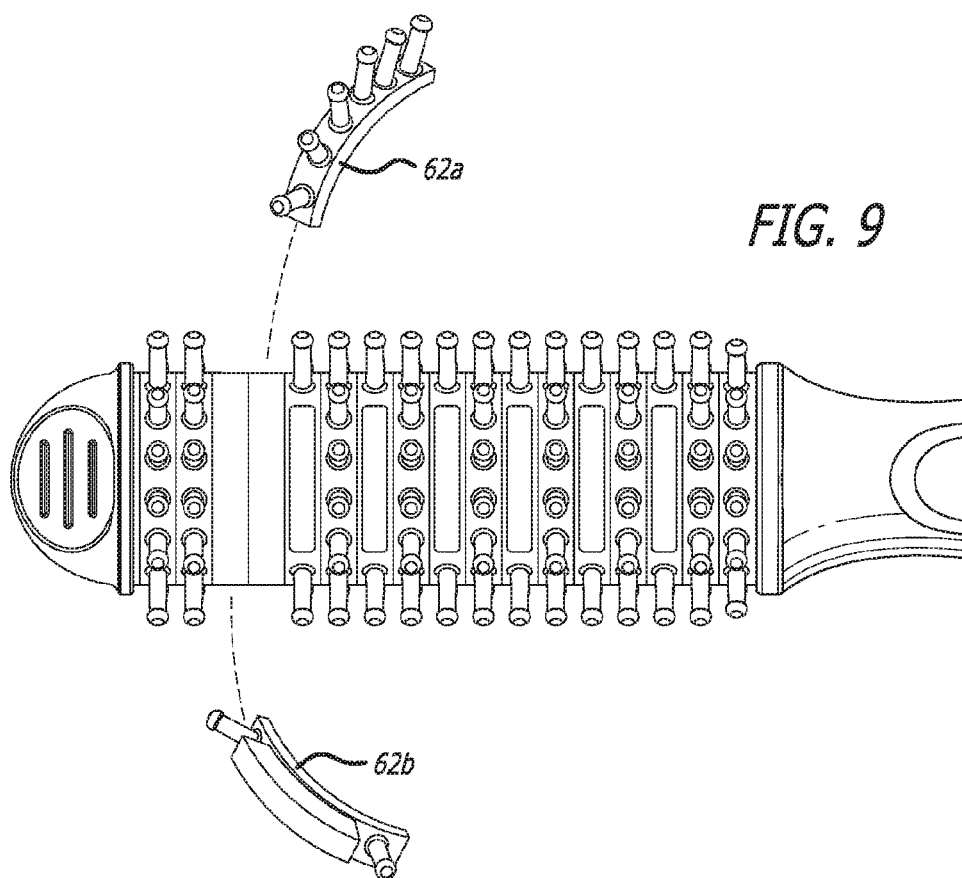


FIG. 1







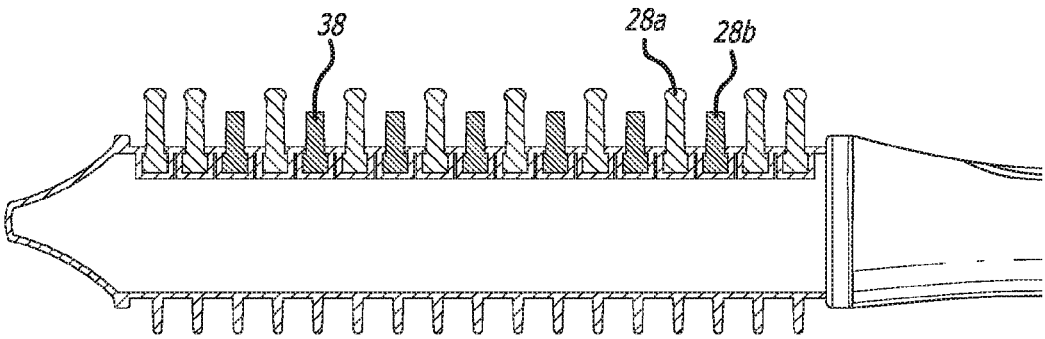


FIG. 11

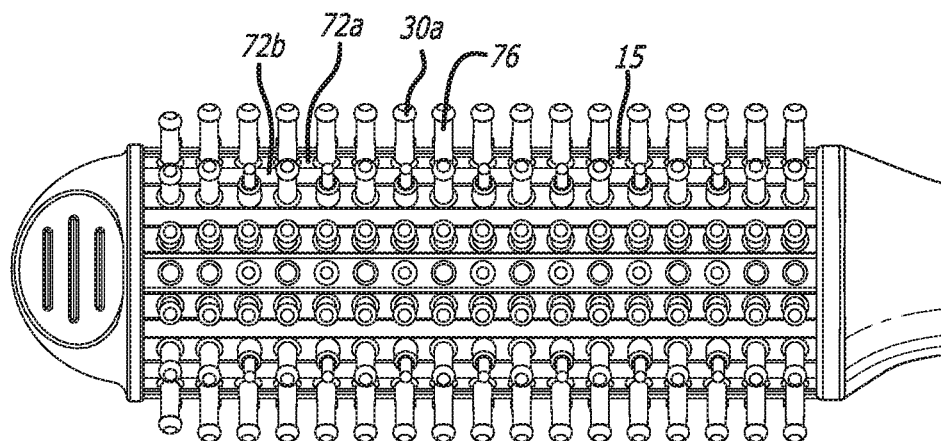


FIG. 12

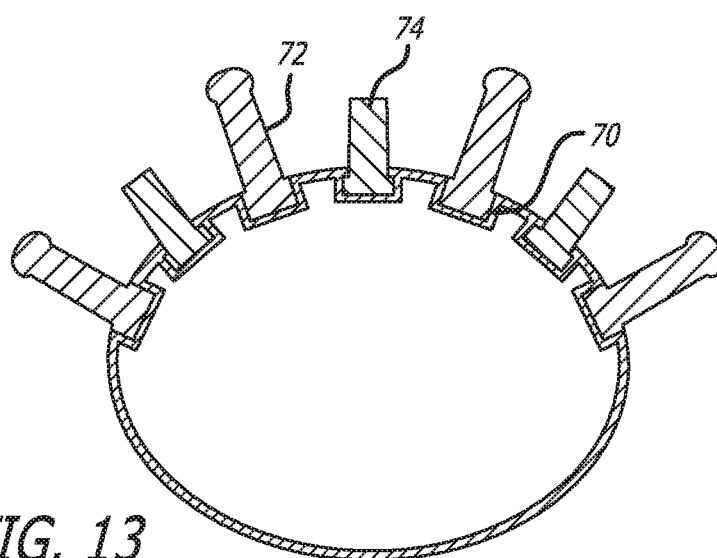
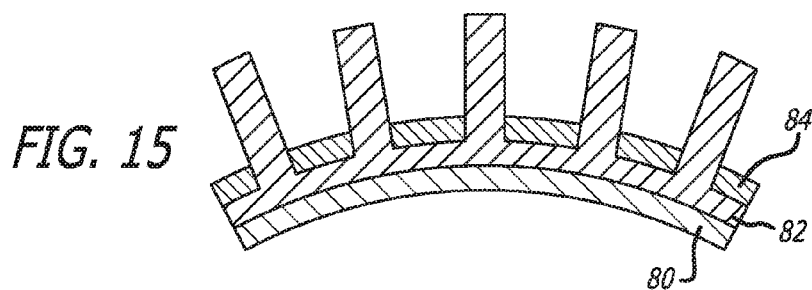
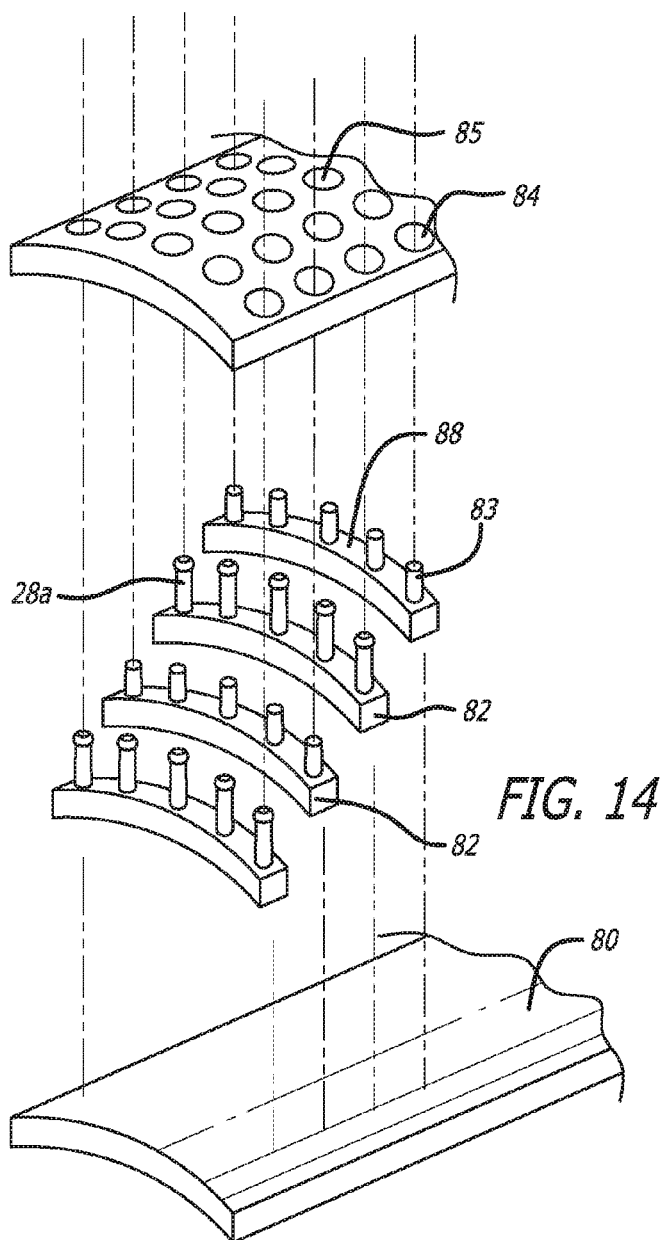


FIG. 13



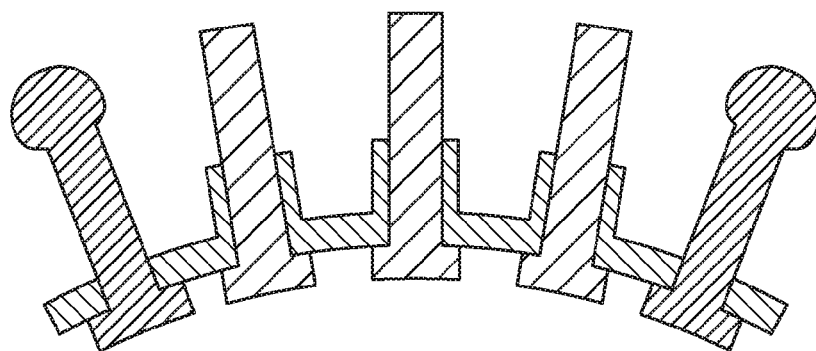
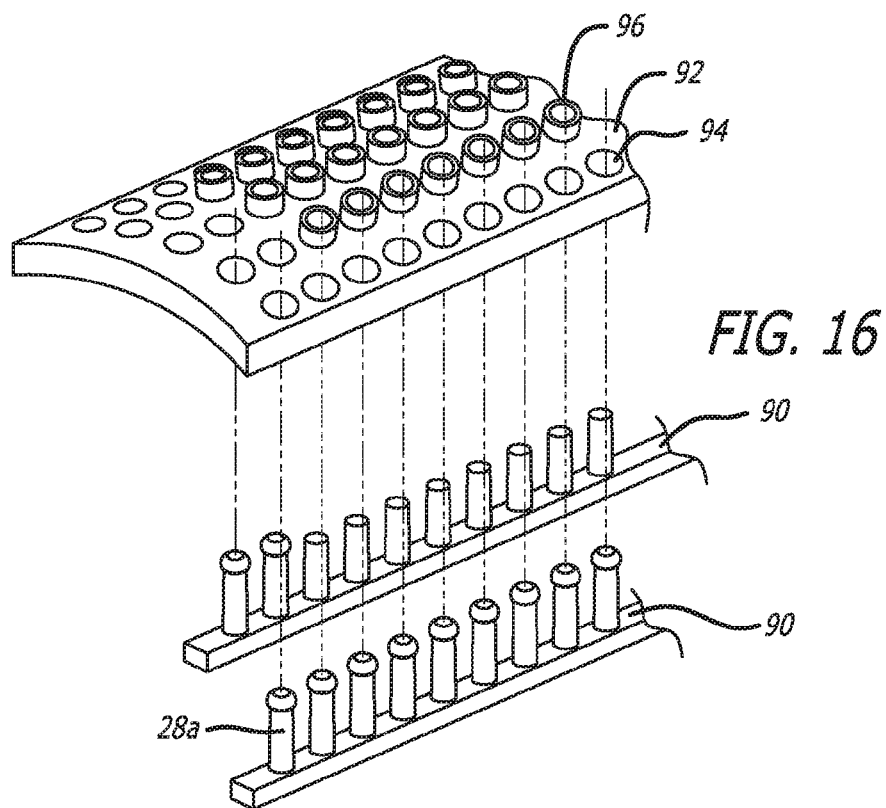


FIG. 17

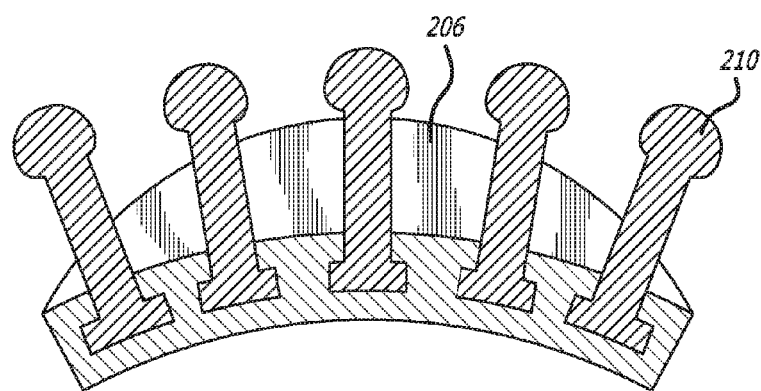
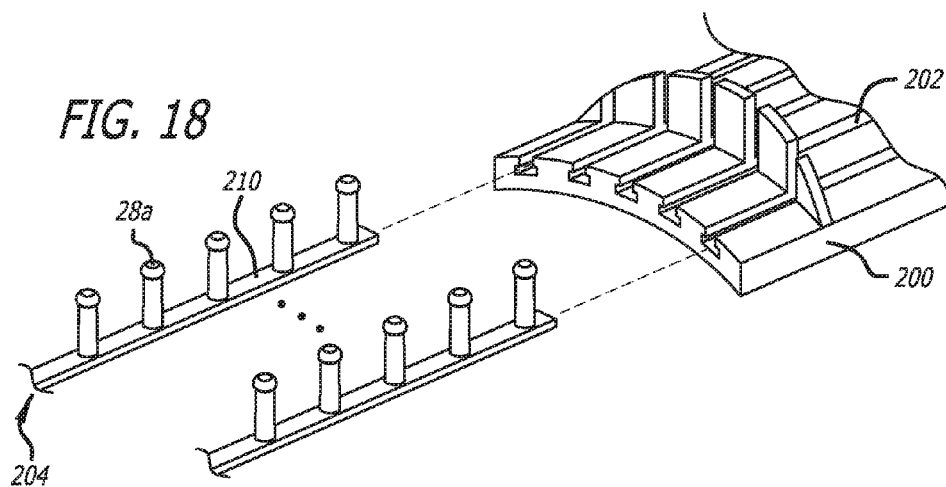


FIG. 19

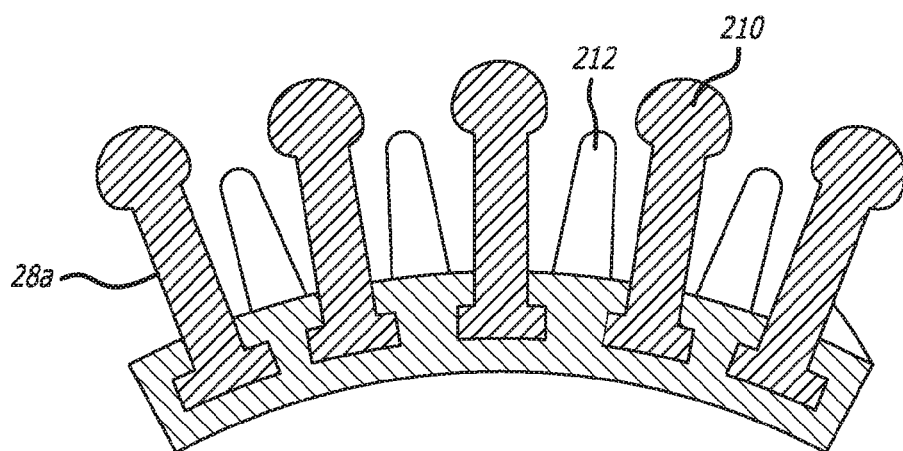
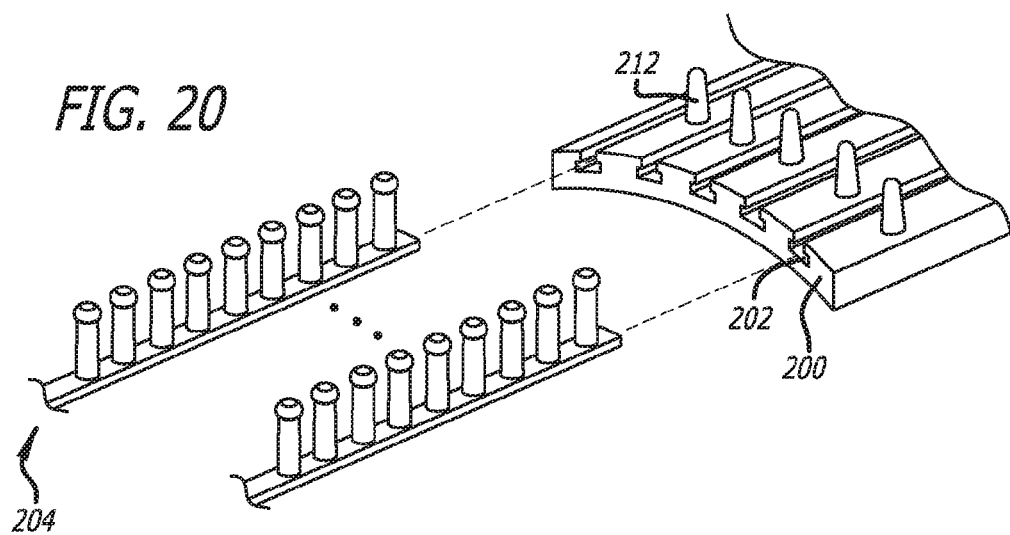
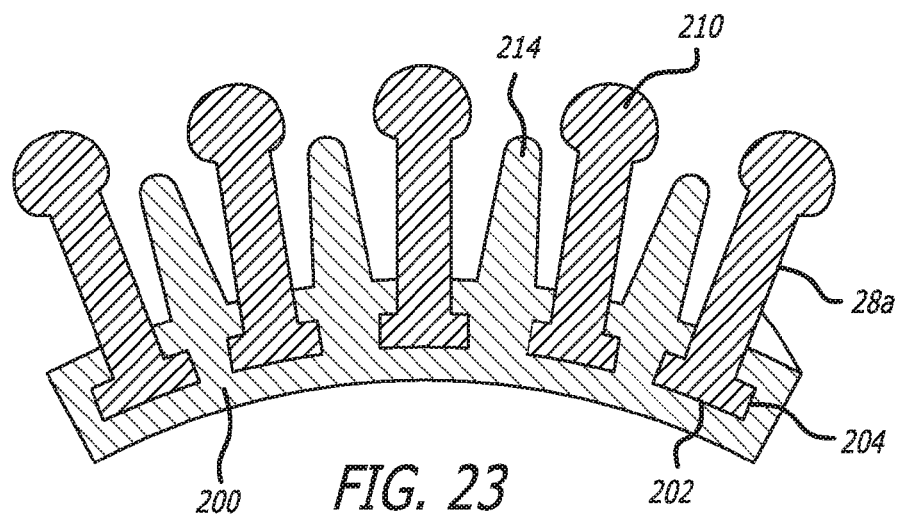
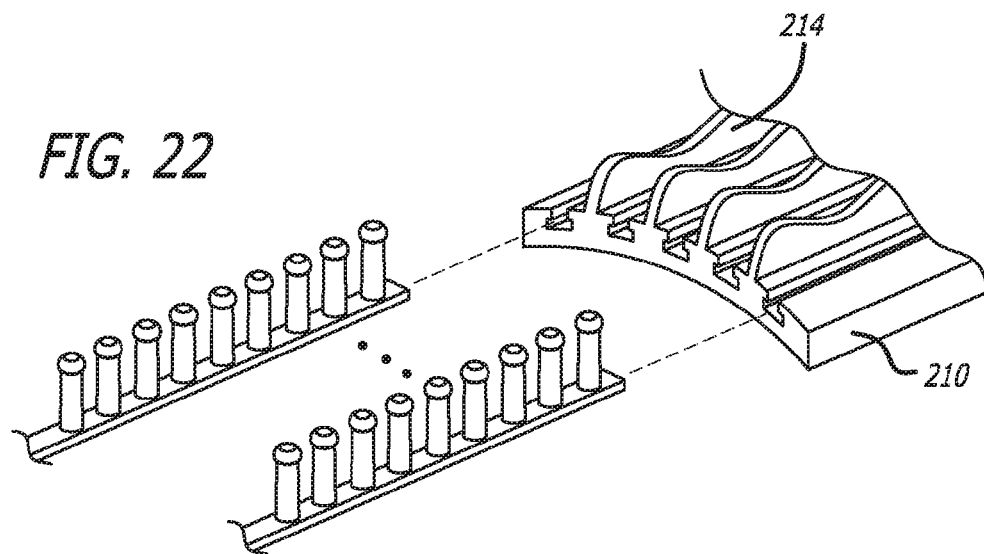


FIG. 21



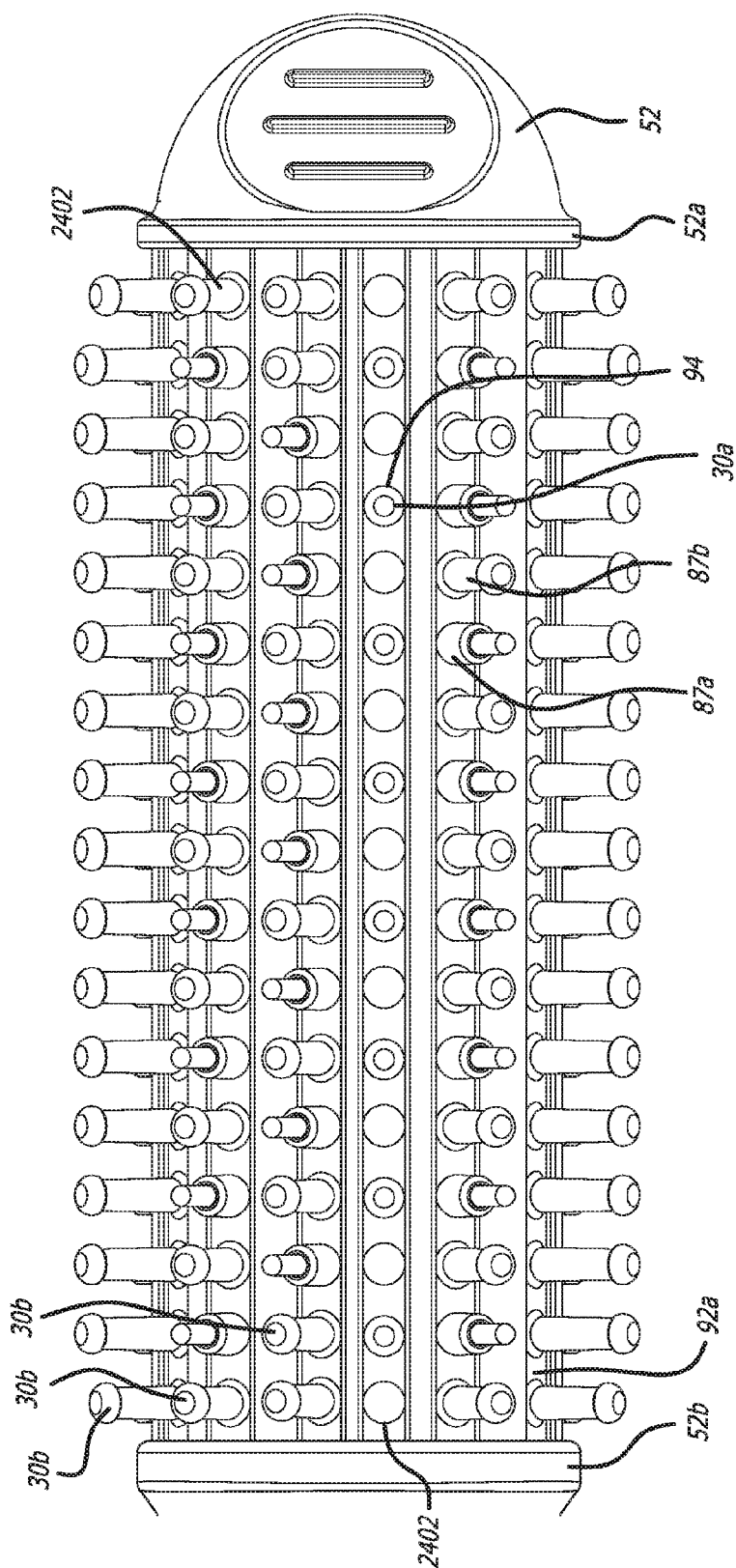
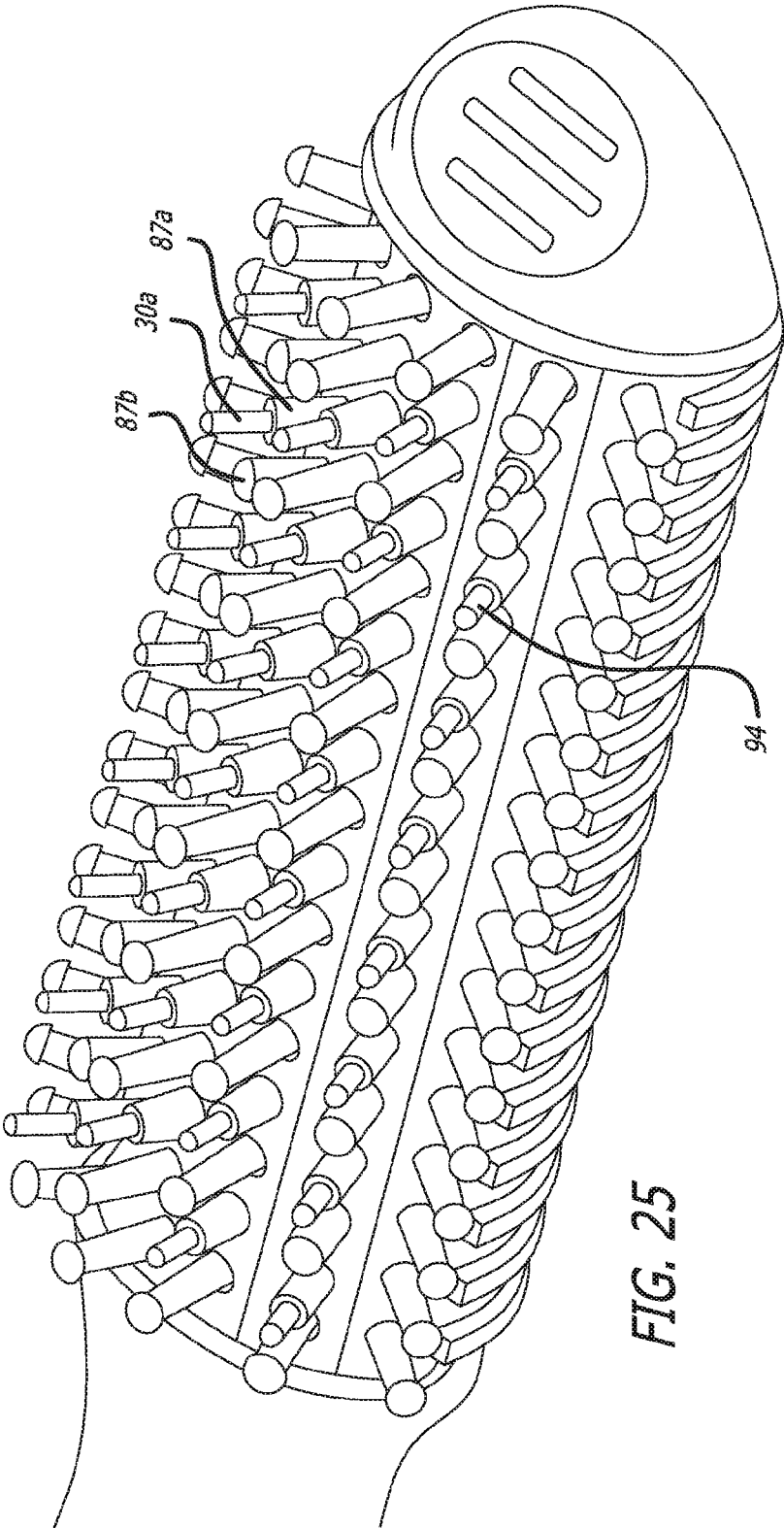
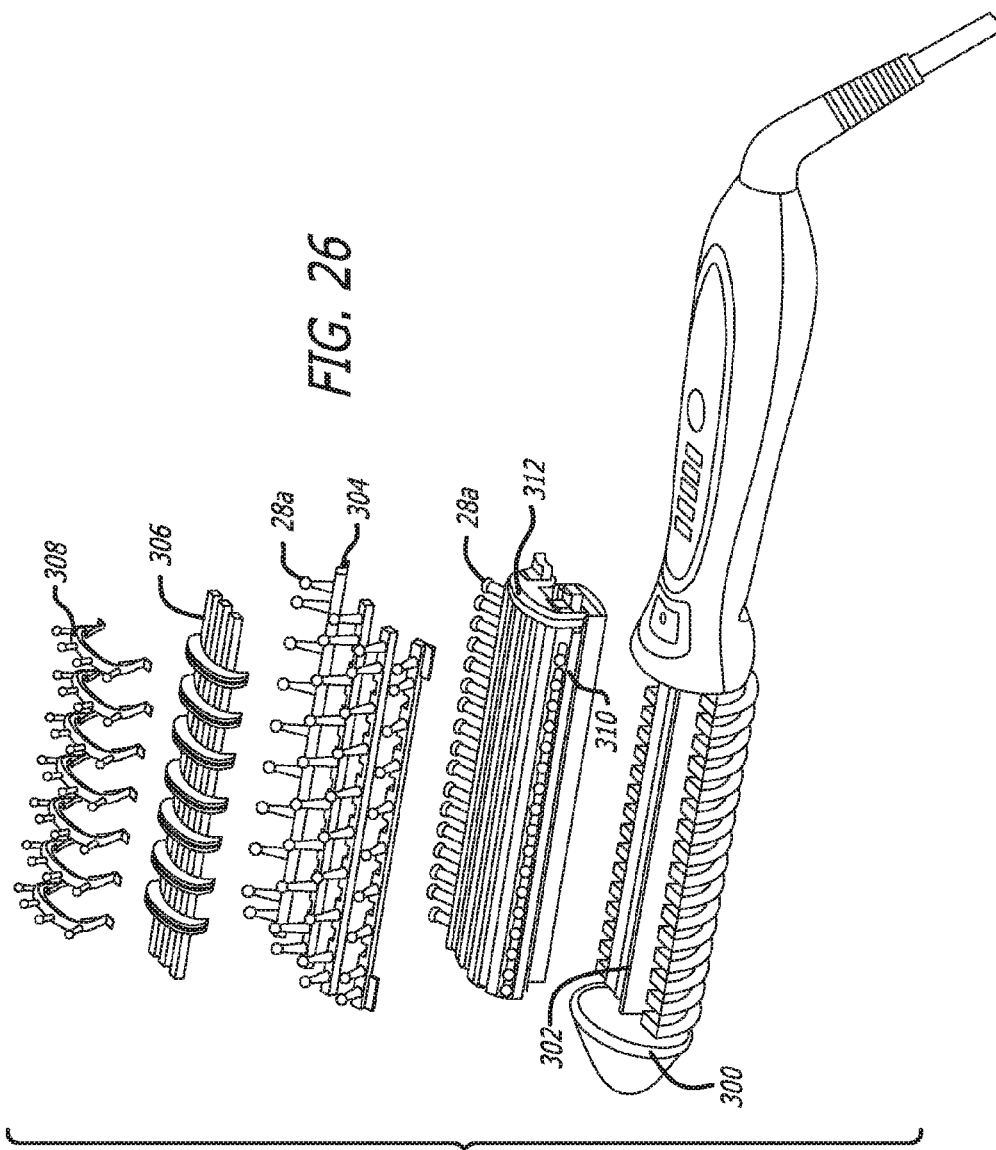


FIG. 24





STYLING BRUSH

PRIORITY

[0001] This application claims benefit under 35 U.S.C. 111(a) as a Continuation-in-Part of U.S. application No. 29/556,335, filed Feb. 29, 2016, which is a Continuation-in-Part of U.S. application No. 29/498,472, filed Aug. 4, 2014, titled “Brush Handle;” and U.S. application No. 29/498,594, filed Aug. 5, 2014, titled “Brush Bristles;” and claims benefit to U.S. Provisional Application No. 62/251,635, filed Nov. 5, 2015; each of which is incorporated by reference in its entirety into this application.

FIELD

[0002] The present invention relates to heating devices, and specifically to hair applications incorporating heating devices for styling.

BACKGROUND

[0003] Hairbrushes, heating irons, and other styling devices are conventionally known and commonly used. Conventional hair brushes generally include a handle or other gripping surface, and a brush or bristle end for separating hair as it is run through a user's hair. Curling or heating irons also conventionally have a handle portion, but include a heating area instead of the brush or bristle end. The conventional hair brush and heating iron have also been integrated into a heating hair brush.

[0004] Typically, the conventional hair brush and heating iron combination tends to have an interior heating surface and conventional brush bristles extending outwardly through the heated portion. When in use, the heat is concentrated on only the outer surface of the hair in contact with the interior surface. Because of the bristles, much of the hair is prevented from contacting the heated surface and heat distribution is limited. However, if the bristles are heated, then the brush poses a hazard to the user. Because the brush is run through a user's hair, the exterior or peripheral ends of the bristles will contact the user's head or hands during styling. If the bristles are heated, then this contact can cause injury or require complicated handling.

SUMMARY

[0005] Embodiments described herein include a heated hairbrush having a brush area and a handle area. The brush area may include one or more heating surfaces or areas.

[0006] In an exemplary embodiment, the heated area is integrated with a portion or all of the brush area. For example, the heating area circumferentially surrounds one or more bristles. The heating area may also be in direct contact with a portion of the bristle.

[0007] In an exemplary embodiment, the heating area may extend radially outward from a base of the brush area to form at least a portion of one or more bristles.

[0008] In an exemplary embodiment, the brush area may include one or more different projections, extensions, or bristles. For example, the brush may include a first set of bristles in which at least a portion of the bristle comprises a heating surface, and a second set of bristles that does not comprise any heating surface and a third set of bristles being a combination of heated and non-heated portions, and any combination thereof. The bristle configuration of the first, second, and third sets of bristles may be different. The

first set of bristles may comprise a heated projection. The second set of bristles may comprise a non-heated projection. The third set of bristles may comprise, for example, a heating surface circumferentially surrounding at least a portion of a non-heating surface bristle. The heating surface is understood to include a material that is configured to be more heat conductive than the non-heating surface. The first set of bristles may comprise, for example, a heating portion toward the body of the brush head, extending away from the brush head, and a non-heating surface at a terminal end of the heating portion. In an exemplary embodiment, at least one of the second set of bristles and/or at least one of the non-heated portion of the third set of bristles extends radially outward beyond any of the first set of bristles or the heated portion of the third set of bristles, such that a radially exterior most component comprises a non-heated contact.

[0009] In an exemplary embodiment, the brush area may also include one or more plates that are designed to fit over the base. The plate may include apertures, through which the bristles may traverse or extend, and/or the plate may comprise integrated bristles. The plate may also include a heating portion.

[0010] In an exemplary embodiment, the brush may be contoured such that the brush area is convex. The curvature may approximate a portion of a curve, an oval, an ellipse, a circle, or other geometric convex curvature.

[0011] In an exemplary embodiment, a back side of the brush area, or a back surface of the brush opposite the bristles may include parallel ridges. The exterior perimeter, profile, or surface defined by the outermost edge of the ridges may be curved, such as, for example, circular, elliptical, or ovoid. The back side may include heating surfaces. In an exemplary embodiment, each ridge may be in the same plane as a row of bristles such that the ridges and bristles are in line when viewed from a side profile of the brush. In an exemplary embodiment, a majority of the defined planes may comprise a ridge, a non-heated bristle and a bristle that is at least partially heated. In an exemplary embodiment, a plane may comprise a ridge, a fully heated bristle, a fully non-heated bristle, and a combination bristle having heated and non-heated portions.

DRAWINGS

[0012] FIG. 1 illustrates a perspective view of an exemplary embodiment of a heated hairbrush.

[0013] FIG. 2 illustrates a side view of an exemplary embodiment of a heated hairbrush.

[0014] FIG. 3 illustrates a view of a second side of an exemplary embodiment of a heated hairbrush.

[0015] FIG. 4 illustrates a view of an end of an exemplary embodiment of a heated hairbrush.

[0016] FIG. 5 illustrates a view of an end of an exemplary embodiment of a heated hairbrush.

[0017] FIG. 6 illustrates a view of a first side of an exemplary embodiment of a heated hairbrush.

[0018] FIG. 7 illustrates a cross sectional view of an exemplary bristle configuration.

[0019] FIG. 8 illustrates a cross sectional view of an exemplary bristle configuration.

[0020] FIG. 9 illustrates a first side view of an exemplary embodiment of a heated hairbrush.

[0021] FIG. 10 illustrates a perspective of an exemplary embodiment of a heated hairbrush.

[0022] FIG. 11 illustrates a cross-sectional view of an exemplary embodiment of a heated hairbrush.

[0023] FIG. 12 illustrates a view of a first side of an exemplary embodiment of a heated hairbrush.

[0024] FIG. 13 illustrates a cross-sectional view of an exemplary embodiment of a heated hairbrush.

[0025] FIG. 14 illustrates an exploded view of an exemplary embodiment of a heated hairbrush.

[0026] FIG. 15 illustrates an illustration of an exemplary bristle and plate configuration according to exemplary embodiments described herein.

[0027] FIG. 16 illustrates an exploded view of an exemplary embodiment of a heated hairbrush.

[0028] FIG. 17 illustrates an illustration of an exemplary bristle and plate configuration according to embodiments described herein.

[0029] FIG. 18 illustrates an exploded view of an exemplary embodiment of a heated hairbrush.

[0030] FIG. 19 illustrates a cross sectional view of an exemplary bristle and base configuration according to embodiments described herein.

[0031] FIG. 20 illustrates an exploded view of an exemplary embodiment of a heated hairbrush.

[0032] FIG. 21 illustrates a cross sectional view of an exemplary bristle and base configuration according to embodiments described herein.

[0033] FIG. 22 illustrates an exploded view of an exemplary embodiment of a heated hairbrush.

[0034] FIG. 23 illustrates a cross sectional view of an exemplary bristle and base configuration according to embodiments described herein.

[0035] FIG. 24 illustrates a view of a first side of an exemplary embodiment of a heated hairbrush.

[0036] FIG. 25 illustrates a perspective view of an exemplary embodiment of a heated hairbrush.

[0037] FIG. 26 illustrates an exploded view of an exemplary embodiment of a heated hairbrush.

DETAILED DESCRIPTION

[0038] The following detailed description illustrates by way of example, not by way of limitation, the principles of the invention. This description will clearly enable one skilled in the art to make and use the invention, and describes several embodiments, adaptations, variations, alternatives and uses of the invention, including what is presently believed to be the best mode of carrying out the invention. It should be understood that the drawings are diagrammatic and schematic representations of exemplary embodiments of the invention, and are not limiting of the present invention nor are they necessarily drawn to scale.

[0039] As used herein, the terms “about” or “approximately” for any numerical values, ranges, shapes, distances, relative relationships, etc. indicate a suitable dimensional tolerance that allows the part or collection of components to function for its intended purpose as described herein.

[0040] Exemplary embodiments described herein include a heated hairbrush. The heated hairbrush may include a bristle portion and a handle portion. The bristle portion may include one or more heated areas. The heated areas may be integrated or form a part of or all of one or more bristles. The heated bristles may include a non-heated portion toward a terminal end of the bristle. The heated hairbrush may include two or more different bristle configurations, including a heated bristle and a non-heated bristle. The brush head may

include a first side supporting the bristles and a second side opposite the first side. The second side of the brush head may comprise ridges or separators that extend across the second side of the brush. Each row of bristle may align with a ridge or separator such that a ridge and row of bristles are contained in a plane approximately perpendicular to the brush axis. Each row of bristle and each separator may form parallel planes along a length of the brush.

[0041] Although embodiments of the invention may be described and illustrated herein in terms of a heated hair brush, it should be understood that embodiments of this invention are not so limited, but are additionally applicable to other styling devices. Exemplary features disclosed herein may be used in any combination, such that features may be removed, duplicated, integrated, separated, etc. For example, a hair brush using the bristle configuration without heated regions, but including the ridged configuration on the back side of the bristle area described herein is within the scope of the present invention. For an additional example, different configurations of heated, non-heated, and/or partially heated bristles may be used with different configurations of heated back plates to form different combinations of heated projections into a bristle interior space.

[0042] FIG. 1 illustrates a perspective view of an exemplary embodiment of a heated hairbrush. As shown in FIG. 1, the heated hairbrush 12 may comprise a first end 52, a second end 54, a head portion 22 and a handle portion 16. The head portion 22 may be located in between the first end 52 and the handle portion 16. As shown in FIGS. 1-2, the head portion 22 may comprise a first side 24 defining a brush area 14 and a second side 26 opposite the first side 24. The brush area 14 may further comprise one or more heated areas 18.

[0043] As shown in FIG. 1, the first end 52 of the heated hairbrush 12 may be located on one end of the head portion 22. As shown in FIG. 3, the first end 52 may comprise a second gripping end 42 to facilitate maneuvering during use. As shown in FIG. 4, the second gripping end 42 may comprise two or more opposing surfaces 44. As illustrated in FIG. 2, a portion of the opposing surfaces 44 may be tapered, contoured or slightly concave, for example, in order to facilitate gripping. As shown in FIG. 1, the opposing surfaces 44 may also include one or more ridges or grooves 50 to further improve the frictional engagement when gripping the surface. The opposing surfaces 44 may terminate in the first end 52 of the heated hairbrush 12.

[0044] As illustrated in FIG. 1, the handle portion 16 may be located in between the second end 54 and the head portion 22. The handle 16 may be ergonomically configured. For example, as shown in FIG. 2, the handle 16 may be shaped to correspond to the palm of a user. As shown in FIG. 1, the handle portion 16 may further comprise a control mechanism 46. The control mechanism 46 may be used for changing the heating ranges of the one or more heated areas 18. The control mechanism 46 may comprise, for example, a button, switch, slide, knob, etc. to set a temperature of the heated areas 18. The control mechanism 46 may also comprise an indicator 48 such as, a light, scale, number, display, etc. The indicator 48 may be configured to relay information, such as the heating level, to a user. In an exemplary embodiment, the hairbrush may include 2-8 heating levels. As shown in FIG. 1, the indicator 48 may be used for five heating levels.

[0045] The brush area 14 may comprise a plurality of bristles 28. The bristles 28 may extend outwardly from a surface of the first side 24. The bristles 28 may be lined up in rows substantially across the brush area 14, where a row is parallel to the brush longitudinal axis. As shown in FIG. 2, the rows may be aligned such that across adjacent rows, bristles may align to form a column. In this case bristles 28 may be lined up in columns substantially across the brush area 14, where a column is perpendicular to the brush longitudinal axis. The bristles 28 may be uniform along their length or may change diameter along its length. More than one configuration of bristles 28 may also be combined. For example, as shown in FIG. 1, a first set of bristles 28a may include a constant profile along a majority of its length, and have a larger profile at a terminal end. The larger profile may be, for example, a flattened bulb, ovoid, or circular terminal end. A second set of bristles 28b may include a constant profile to a terminal end of the length. The second set of bristles 28b may include a larger profile toward the head portion 22. The profile changes may be step-wise or gradual along the bristle.

[0046] In an exemplary embodiment, the one or more heated areas are integrated with a portion of or all of the brush area. For example, as shown in FIG. 1, the heated areas 18 circumferentially surround one or more bristles 28. The heated areas 18 may also be in direct contact with a portion of the bristle 28. The heated area 18 may extend from the first side 24 of the brush head 22 to define a portion of the bristle 28. The heated area 18 may fill a space between adjacent bristles 28 in a row, and may circumferentially surround or enclose a length of the bristles. The heated area 18 may extend along the entire length of a row, or along only a portion of the row.

[0047] The brush area may also include one or more bristles that are not heated. For example, the brush area 14 may include non-heated ends. The terminal end of the brush area towards the first end 52 may include a larger non-heated area than the end toward the handle portion 16. The exterior rows of bristles along opposing sides of the brush area may also not include heated areas along their entire length. The exterior bristles are those toward the outer perimeter 15 of the brush area 14. Each or all of the bristles around the exterior perimeter of the brush area may be unheated. The non-heated areas may be used to prevent inadvertent contact by a user as they hold the handle or brush end during use. Therefore, the interior bristles of the brush area may comprise heated areas while the exterior bristles of the brush area do not include heated areas. As shown in FIG. 6, the exterior bristles on opposing ends of a row may not include a heated area. The last bristle of a row towards the handle and the last two bristles of a row towards the opposing end of the brush also may not include heated areas.

[0048] In an exemplary embodiment, the brush area may include one or more different bristle configurations. For example, the brush area may include a second set of bristles in which at least a portion of the bristle comprises a heated surface, and a first set of bristles that does not comprise any heated surface. The bristle configuration of the first and second set of bristles may be different. The second set of bristles may comprise, for example, a heated surface circumferentially surrounding at least a portion of a non-heated portion of a bristle. The heated surface is understood to include a material that is configured to be more heat conductive than the material of the non-heated surface. The first

set of bristles may comprise, for example, a heated portion toward the body of the brush head, extending away from the brush head, and a non-heated surface at a terminal end of the heated portion. The non-heated portion having a low conductivity of heat such that heat from the heated portion is limited from propagating to the terminal end of the bristle. FIGS. 7 and 8 illustrate exemplary sets of bristle configurations.

[0049] FIG. 7 illustrates an exemplary non-heated set of bristles 30a. The bristles 30a comprise a shaft 31 extending at a set interval between adjacent shafts. The terminal end of the bristle may comprise a larger diameter end 32, such as a bulb or spheroid. The terminal end of the bulb may be flattened. Adjacent shafts 31 forming a base of the bristle may extend from a base shaft 34 defining the row. The bristle shafts 31 are aligned longitudinally along the base shaft 34 and extend perpendicularly or radially therefrom.

[0050] FIG. 8 illustrates an exemplary set of combination heated 30b and non-heated bristles 30a. The heated bristles 30b may be similar to the non-heated bristles in that a series of shafts 36 defining a base of the bristles extends from a longitudinal base 37 radially outward and align longitudinally. The longitudinal base may be a heating structure. The longitudinal base 37 may be a non-heating shaft covered on one, two, three, or all sides by a heated surface. The bristles may include an inner non-heated shaft 36. The bristles may also include a heated collar 38 or ring circumferentially surrounding a lower region of the non-heated shaft 36. The heated collar 38 may be integrated with or may directly contact heated material extending between or spanning the space between adjacent bristles in a row. The non-heated shaft 36 may be longer than the heated collar 38 such that the non-heated shaft defines the terminal end of the bristle. The profile of the non-heated shaft may be variable or constant. As shown, the non-heated shaft 36 may be a constant diameter along its length. The length of the heated bristle 36 is such that it controls the hair as desired. The heated portion relative to the non-heated portion may be chosen such that the desired or maximum heat is provided while preventing or reducing the likelihood of direct contact with skin during use. For example, enough non-heated bristle 36 length is left at the terminal end such that if the brush were to contact surface skin, even if pressed hard, or even the relatively pliable location such as a user's palm, the skin would not deform around the bristle end and contact the heated collar 38 directly.

[0051] In one embodiment, the non-heated portion 36 of the heated bristles 30b may be comprised of a heat-resistant material, such as carbon fiber, in order to withstand the heat from the heated portion. The heated portion 38 may be comprised of a heat conductive material, such as ceramic, in order to facilitate the propagation of heat from a heat source to the heated surface. The non-heated bristles 30a may be nylon.

[0052] In another exemplary embodiment, the heated and non-heated rows of bristles may fit into a head of the brush, such as in mated grooves or slots. The mating may permit or limit movement between the bristles and the brush head. In an exemplary embodiment, the non-heated bristle row is positioned as an outside row and is coupled to the brush head such that the bristles may move relative to the brush head. The movement may be rotational, longitudinal, or radial. The heated bristle row may be positioned such that relative

movement between the bristles and brush head is prevented. FIGS. 9-13 illustrate this embodiment.

[0053] As shown in FIGS. 9-11, the brush area 14 may comprise multiple slots 60 or groves and multiple tracks 62. As shown in FIG. 9, the multiple slots 60 or groves and multiple tracks 62 may be substantially parallel with the latitudinal axis of the brush. The multiple tracks 62 may be configured to mate-ably interact with the multiple slots 60 such that a single track 62 may slide into a single slot 60. As shown in FIG. 10, once the multiple tracks 62 are slid into the multiple slots 60, the bristles on the multiple tracks may align to form multiple rows of bristles.

[0054] As shown in FIG. 9, the multiple tracks may comprise one or more non-heated tracks 62a and one or more heated tracks 62b. The non-heated tracks 62a may further comprise multiple non-heated bristles 30a. Each of the heated tracks 62b may further comprise one or more bristles, heated 30b and/or non-heated 30a, and a heated area 18. The heated tracks 62b may be configured such that the heated area 18 may be a raised surface on the heated track 62b and may be located substantially in the middle of the heated track, with the heated 30b and/or non-heated bristles 30a located on either side of the heated area 18. As shown in FIG. 11, the heated bristles 30b may also include a heated collar 38 or ring circumferentially surrounding a lower region of the shaft of the bristle.

[0055] As shown in FIGS. 12-13, the brush area may comprise multiple slots or groves and multiple tracks. As shown in FIG. 13, the multiple slots 70 or groves and multiple tracks 72 may be substantially parallel with the longitudinal axis of the brush. The multiple tracks 72 may be configured to mate-ably interact with the multiple slots 70 such that a single track 72 may slide into a single slot 70. As shown in FIG. 12, once the multiple tracks 72 are slid into the multiple slots 70, the bristles on the multiple tracks may align to form multiple rows of bristles.

[0056] As shown in FIG. 12, the multiple tracks may comprise one or more non-heated tracks 72a and one or more heated tracks 72b. The non-heated tracks 72a may further comprise multiple non-heated bristles 30a. Each of the heated tracks 72b may further comprise multiple heated 74 bristles. As shown in FIG. 13, each of the heated bristles 74 may comprise a shaft 76 extending perpendicularly, at a set interval, from the heated track 72. The terminal end of the heated bristle may comprise a larger diameter end, such as a bulb or spheroid. The terminal end of the bulb may be flattened. The shaft 76 may also taper, such that the diameter of the terminal end of the shaft 76 thins as the shaft 76 moves away from the heated track 72.

[0057] As shown in FIG. 13, the brush area 14 may further comprise a heated area 18. The multiple tracks 72 may be substantially lined with the heated area 18. The heated bristles 74 may be comprised of a heat conductive material in order to facilitate the propagation of heat from the heated area 18. The length of the non-heated bristles 30a may be longer than that of the heated bristles 74. As such, the desired or maximum heat is provided while preventing or reducing the likelihood of direct contact with skin during use.

[0058] In an exemplary embodiment, the brush area may further comprise a base, multiple inserts, one or more heated areas, and a plate. The multiple inserts may comprise multiple bristles. The multiple bristles may project upward from a bottom portion of the insert. The multiple bristles

may be heated and/or non-heated. The plate may comprise multiple cavities or holes. The cavities may be of sufficient size such that at least one bristle may pass through each cavity and traverse the plate from one side to the other. The heated and non-heated rows of bristles may be placed on top of the base and the plate may be placed on top of the rows of bristles, with the bristles passing through the cavities in the plate. The one or more heated areas may be located on top of the base and/or on the plate. The plate may be configured to mate with the base, therefore holding the rows of bristles in place. FIGS. 14-15 illustrate this embodiment.

[0059] As shown in FIGS. 14-15, the brush area may comprise a base 80, multiple inserts 82, one or more heated areas, and a plate 84. The inserts 82 may be comprised of multiple bristles 30 and a bottom portion 88. The bristles 30 may project upward from the bottom portion 88. A top portion 86 of the base 80 may be configured to receive the inserts 82. The plate 84 may comprise multiple cavities or holes 85. The multiple holes 85 may be of sufficient size such that one or more of the bristles 30 may be able to pass through each of the holes 85. The one or more heated areas may be located on the base 80 and/or the plate 84. The plate 84 may also be configured to mate-ably interact with the base 80. The plate 84 may secure the inserts 82 to the base 80 once the inserts 82 are received by the base 80. Therefore, the inserts 82 may lie between the base 80 and the plate 84.

[0060] Exemplary embodiments include any combination of heated, non-heated, and partially heated bristles, and inserts, and base as described herein. For example, FIGS. 24-25 provide an exemplary embodiment integrating different features as described herein. The bristles may be heated 87b, non-heated 30b, or partially heated 87a/30a. The heated bristles 87b or heated portion 87a of combination bristles may comprise a heat conductive material in order to facilitate the propagation of heat from the one or more heated areas to the heated bristles. Any combination of heated and non-heated bristles may be used. The heated bristles or heated portion of bristles may be a shorter length than the non-heated bristles or portions of the non-heated bristles, such that a non-heated portion forms the exterior or radially outer most surface or contact. Therefore, a desired heat distribution may be provided through an interior volume of bristles while preventing or reducing the likelihood of direct contact with skin during use.

[0061] The combination heated and non-heated bristle may use different configurations. For example, as shown in FIGS. 24-25, the partially heated bristles may include combinations similar to those illustrated in FIGS. 6-8. For example, a collar layer may be placed underneath a plate 92a, such that the collar layer lies on top of the multiple inserts. The collar layer may comprise multiple collars 87a and/or pegs 87b. The collars 87a may fit through the holes 94 of the plate, such that a single collar 87a wraps around the circumference of one of the holes 94. Therefore, as shown in FIGS. 24-25, the bristles 30a may protrude through both the hole 94 and the collar 87a. The pegs 87b may be configured to completely cover the bristles. A length of the collars 87a may be shorter than a length of the pegs 87b. The collar layer may therefore, similar to FIG. 16 include a based and integrally formed collars extending therefrom. More similarly to the embodiment of FIGS. 6-8, the collar layer may comprise a plurality of layers in which individual lengths correspond to a row of bristles. Therefore,

a plurality of layers comprising heated materials may be provided with collars extending therefrom.

[0062] In an embodiment, the pegs **87b** may be placed over a portion of the insert on which there are no bristles. Therefore, one or more of the pegs **87b** may be placed on an empty portion of the insert, such that the peg **87b** takes the place of a bristle.

[0063] The collars **87a** and the pegs **87b** may comprise a heat conductive material in order to facilitate the propagation of heat from the one or more heated areas. The length of the collars **87a** and pegs **87b** may be a shorter length than the non-heated bristles **30a**. Therefore, the desired or maximum heat may be provided through an interior bristle volume while preventing or reducing the likelihood of direct contact with skin during use.

[0064] In an exemplary embodiment, outer rows of bristles may comprise non-heated materials along an entire length. The non-heated rows of bristles may be on opposing outer sides of the brush head. The interior bristle area may comprise a combination of heated, partially heated, and non-heated bristles. For example, terminal ends of a bristle row may include non-heated bristles. The remaining row of bristles may alternate between non-heated bristles, fully heated bristles, partially heated bristles, or combinations thereof. As shown, for example in FIG. **24**, rows **2402** alternate between non-heated bristles and partially heated bristles, while rows **2404** alternate between heated bristles and partially heated bristles. The alternating bristles may be aligned along the brush length, such as with rows **2404** so that a column includes heated bristles and an adjacent column includes partially heated bristles. The alternating bristles may also be offset from adjacent rows, such as illustrated for rows **2402**. Therefore, each column may include a non-heated bristle and a partially heated bristle. Overall, a plurality of columns may therefore include at least one of a non-heated bristle, a fully heated bristle, and a partially heated bristle. Overall a plurality of columns may include non-heated bristles and partially heated bristles.

[0065] As shown in FIG. **24**, the plate **92a** may be contoured. As shown, the plate **941** may include a raised surface adjacent or along the bristles and an indented surface between adjacent rows of bristles. As shown in FIG. **14**, the plate **84** may also be approximately uniformly curved such that an outer surface is not contoured relative to the rest of the plate.

[0066] The plate may be couple to the brush to retain the bristles to the brush head. In an exemplary embodiment the plate may overlap a plurality of inserts defining the bristles. The plate may be attached to the brush head through a lip or overhang **52a**, **52b** on opposing terminal ends of the plate. For example, the brush handle may include a lip or overhang **82b** in which the plate, including the protruding bristled may be captured. The end portion **52** may include separable front and back portions. The front portion may, for example, be glued, screwed or otherwise attachable to the back portion. Once the plate and projecting bristles are positioned against brush back portion under overhang **52b**, the front portion of end portion **52** may be coupled to back portion and thereby position plate under overhang or flange **52a**.

[0067] In an exemplary embodiment, the plate may comprise multiple cavities or holes, such that the bristles may extend through the plate. The plate may also comprise a heated portion and one or more collars configured to wrap around the circumference of one or more of the holes. The

movement may be rotational, longitudinal, or radial. FIGS. **16-17** illustrate this embodiment.

[0068] As shown in FIG. **16**, the brush may comprise multiple rows **90** of bristles and a plate **92**. Each row may comprise multiple non-heated bristles **30a**. The plate **92** may comprise multiple cavities or holes **94** and one or more collars **96**. The collars **96** may fit on top of the holes **94**, such that a single collar **96** wraps around the circumference of one of the holes **94**. The multiple holes **94** may be configured to receive one or more of the non-heated bristles **30a**. Therefore, as shown in FIG. **17**, the non-heated bristles **30a** may protrude from both the hole **94** and the collar **96** wrapping around the hole **94**.

[0069] The plate **92** may also comprise one or more heated areas. The collars **96** may transmit heat from the heated areas to the non-heated bristles **30a** located inside of the hole **94** that the collar **96** wraps around. The collars **96** may comprise a heat conductive material in order to facilitate the propagation of heat from the one or more heated areas. In addition to providing heat to the brush, the plate **92** may also function to secure the one or more rows **90** of bristles in place.

[0070] In an exemplary embodiment, one or more rows of bristles may fit into a head of the brush, such as in mated groves or slots. The mating may permit or limit movement between the bristles and the brush head. In an exemplary embodiment, the bristles may be non-heated. The mated groves or slots may be formed in between one or more raised portions. The raised portions may be heated. FIGS. **18-23** illustrate this embodiment.

[0071] As shown in FIG. **18**, the brush area may comprise a base **200**, multiple groves or slots **202**, and multiple tracks **204**. The base **200** may comprise a single raised surface **206**. The raised surface **206** may be configured to span substantially the width of the brush area. The base **200** may comprise one or more indentations, with each indentation containing one of the multiple slots **202**. The tracks **204** may comprise multiple non-heated bristles **30a** which may project upward from a bottom portion **210** of the track. The slots **202** may be configured to mate-ably interact with the tracks **204**, such that a single track **204** may be placed into a single slot **202**, with the bristles **30a** facing upwards.

[0072] The base **200** may be configured to be heated. The raised surface **206** may be comprised of a heat conductive material, thereby facilitating the propagation of heat from the base **200**. As shown in FIG. **19**, the bristles **30a** may be of sufficient length such that the tops of the bristles **210** protrude above the raised surface **206** when the tracks are placed in the slots. As such, the desired or maximum heat may be provided while preventing or reducing the likelihood of direct contact with skin during use.

[0073] As shown in FIG. **19**, the raised surface **206** may be a single curved surface. In an exemplary embodiment, the raised surface may be configured to be continuous. As such, the raised surface may span a substantial portion, if not all of, the longitudinal axis of the brush area.

[0074] In an exemplary embodiment, the raised surface may be discontinuous. As such, the raised surface may comprise vertical projections. These vertical projections may align with the ridges or separators that extend across the second side of the brush.

[0075] In an exemplary embodiment, the brush area may comprise multiple raised surfaces. As shown in FIG. **20**, the multiple raised surfaces **212** may comprise multiple vertical projections on a surface of the base **200**. The base **200** may

be configured such that the raised surfaces **212** may be placed in between the tracks **204** once the tracks are positioned in the slots **202**, such that no two tracks are directly next to each other. The multiple raised surfaces **212** may be tapered, such that the diameter of the raised surface decreases as the distance of the raised surface **212** from the base **200** increases. The multiple raised surfaces **212** may be comprised of a heat conductive material, thereby facilitating the propagation of heat from the base **200**.

[0076] As shown in FIG. **21**, the bristles **30a** may be of sufficient length such that the tops of the bristles **210** protrude above the raised surface **212** when the tracks are placed in the slots. As such, the desired or maximum heat may be provided while preventing or reducing the likelihood of direct contact with skin during use.

[0077] In other exemplary embodiments, the multiple raised surfaces may comprise vertical projects that are bristle-like and/or cylindrical.

[0078] As shown in FIG. **22**, the multiple raised surfaces **214** may comprise longitudinal projections on a surface of the base **200**. The multiple raised surfaces **214** may be configured to run parallel to the longitudinal axis of the brush. The multiple raised surfaces **214** may be configured to span substantially the entire length of the brush area. The base **200** may be configured such that the raised surfaces **214** may be placed in between the tracks **204**, such that no two tracks are directly next to each other once the tracks are positioned in the slots **202**. The multiple raised surfaces **214** may be comprised of a heat conductive material, thereby facilitating the propagation of heat from the base **200**.

[0079] As shown in FIG. **23**, the multiple raised surfaces may be of sufficient height such that the tops of the bristles **210** protrude above the raised surface **214** when the tracks are placed in the slots. As such, the desired or maximum heat may be provided while preventing or reducing the likelihood of direct contact with skin during use.

[0080] In an exemplary embodiment, the brush may comprise multiple heated and non-heated elements. The non-heated elements may be placed over the heated elements. The multiple non-heated elements may act in order to prevent or reduce the likelihood of direct contact with skin during use.

[0081] As shown in FIG. **26**, the brush area may comprise a frame **300**, a base **302**, multiple combs **304**, one or more cross-members **306**, and one or more guards **308**. The frame **300**, the base **302** and the cross-members **306** may be heated. The multiple combs **304** and the guards **308** may be non-heated. The frame **300** may be configured to accept the base **302**. The base **302** may further comprise two raised rims **310** and one or more slots **312**. The combs **304** may further comprise non-heated bristles **30a**. The non-heated bristles **30a** may protrude up from a surface of the combs **304**. The raised rims **310** and the slots **312** may be configured to receive one comb **304** each. The combs **304** may be configured to be placed into the raised rims **310** and the slots **312** such that the bristles **30a** face upwards, away from the base **302**. The one or more cross-members **306** may be configured to be placed on top of the base **302**. The one or more cross-members **306** may be convex, such that the cross-members **306** extend outward from the base **302**. The cross-members **306** may comprise cavities or holes so as to allow the bristles **30a** to protrude outwards. The guards **308** may be configured to mate-ably interact with the cross-members **306**. The guards **308** may be placed on top of the

cross-members **306**. The guards **308** may reduce or prevent the heated cross-members **306** from contacting the skin when in use.

[0082] The frame **300** may comprise a heat source. The base **302** and the one or more cross-members **306** may comprise a heat conductive material so as to facilitate the propagation of heat from the frame **300**.

[0083] The cross-members **306**, raised rims **310**, and the guards **308** may comprise one or more connections. The one or more connections may facilitate the cross-members **306**, raised rims **310**, and the guards **308** mate-ably interacting with the base **302**. The connections may comprise any, or a combination of any, of the following: one or more outward projections or one or more clips that may slide into corresponding holes on the base **302**; one or more interior projections that may snap onto a corresponding exterior projection on the base **302**; or one or more downward projections that may snap into corresponding holes on the base **302**. The connections may be placed along substantially the entire length of the brush area.

[0084] The guards **308** may be configured to mate-ably interact with the cross-members **306** via an indentation or one of, or a combination thereof, one of the connections described above.

[0085] As illustrated in FIG. **26**, in one embodiment, the one or more guards **308** may be configured to snap onto the raised rims **310**.

[0086] In an exemplary embodiment, the brush may be contoured such that the brush area is convex. The curvature may approximate a portion of a curve, an oval, a circle, ellipse, or other geometric convex curvature. For example, when viewing the brush from a side profile the bristles in each row project upward in the profile plane. The bristles along the middle of the brush area extend upwardly in the profile plane the highest, and each row outward from the central row(s) get increasingly shortly in the profile plane.

[0087] In an exemplary embodiment, a back side of the brush area, or a back surface of the brush area opposite the bristles may include parallel ridges. As shown in FIGS. **4-5**, the second side **26** of the brush head **22** may comprise ridges **40** or separators that extend across the second side of the brush. The exterior perimeter or surface of the ridges **40** may be curved, such as, for example, circular, elliptical, or ovoid. The ridges **40** may extend generally perpendicular to the brush longitudinal axis and across the second side **26**. The ridges **40** may align with bristles from the first surface such that a column of bristles (i.e. the aligned bristles across adjacent rows) is aligned or contained in the same plane as a ridge **40**. The ridge **40** may be generally planar and parallel with adjacent ridges. Adjacent ridges may be separated by a gap approximately equal to the gap between adjacent bristles forming a row.

[0088] The second side **26** of the brush head **22** and/or portions of the ridges may include one or more heated surfaces. For example, the second side **26** of the brush head between ridges may include a heated surface. Similar to the bristles, a lower portion or portion toward the brush head of the ridges may also or alternatively include heated surfaces.

[0089] The brush head may include one or more heated elements that directly or indirectly contact the heated surfaces. The heated elements may be powered to generate and transfer heat to the heated surfaces. The heated element may be digital or analog. In an exemplary embodiment the heated element may be a positive temperature coefficient (PTC)

heater. In an exemplary embodiment, the heated element may comprise a metal ceramic heater plate (MCH). The brush may be, for example, battery operated. The battery may be enclosed within the brush head or handle. The brush may also or alternatively be AC powered such as through a power cord. The hair brush may also include a timer such that it automatically shuts off after a period of time. The hair brush may also include one or more sensors, such as a level sensor, accelerometer, pressure sensor, etc. The hair brush may be configured to shut off and/or turn on when it is not in user, or when it is in user. For example, when stationary, level, or not being gripped as detected by one or more of the sensors, the brush may go into a sleep mode in which the heated elements are turned off or set to a reduced heat. When the hair brush is being moved, is tilted, or being gripped as detected by one or more of the sensors, the brush may heat to the desired or set heating level.

[0090] In an exemplary embodiment, the brush may be contoured such that the brush area is convex. The curvature may approximate a portion of a curve, an oval, a circle, ellipse, or other geometric convex curvature. For example, when viewing the brush from a side profile the bristles in each row project upward in the profile plane. The bristles along the middle of the brush area extend upwardly in the profile plane the highest, and each row outward from the central row(s) get increasingly shortly in the profile plane.

[0091] In an exemplary embodiment, the heated hairbrush may include, for example 4-10 rows of 10-30 bristles. A bristle row may be 2-5 inches long. Adjacent rows may be separated by 0.1 to 0.5 inches. As shown in FIG. 1, six rows of bristles are provided in which each row has 17 bristles.

[0092] The heated bristles may have a height of 0.4 to 0.6 inches. The height of the heated portion of the heated bristle may be between 0.2 and 0.3 inches. Therefore, the length of the heated portion of the bristle may be 40-75% of the length of the entire bristle. The non-heated portion of the heated bristle may have a length past the heated portion of between 0.1 and 0.2 inches. The length of the non-heated bristle may be 0.1 and 0.3 inches. Therefore, the length of the non-heated bristles, or the bristles along opposing exterior edges may be longer than the length of the heated bristles, or the bristles within the interior of the brush head. The diameter of the heated portion of the heated bristle may be between 0.1 and 0.2 inches, while the diameter of the unheated portion may be between 0.05 and 0.1. The diameter of the heated portion may be between 1.5 to 2.5 times the diameter of the unheated portion. The larger diameter head or bulb of the non-heated bristles may be between 0.07 and 0.2 inches, while the width of the shaft of the non-heated bristles may be 0.05 to 0.15. The bulb or enlarged end may have a diameter 1.3 to 2 times as large as the diameter of the shaft.

[0093] The width of the brush head may be 0.5 to 2 inches. The width of the ridges across the brush head may be 0.5 to 2.2 inches. Therefore, the widest part of the ridge may be wider than a base portion or second side of the brush head. The widest part of the ridge is approximately 0-0.2 inches wider than the widest part of the brush head second side. Ridges may be separated by 0.1-0.2 inches and may be between 0.07 and 0.1 inches thick.

[0094] The lengths and measurements provided herein are exemplary only. For example, a heated bristle may have a heating component along the entire length of the bristle. The overall size of a brush may be reduced or enlarged such that the dimensions may scale for smaller and larger embodi-

ments. The ranges are provided for simplicity and are meant to include every measurement, at least on a 0.001 increment between and inclusive of the identified endpoints. For example, a range of 0.001 to 0.004 would include each of 0.001, 0.002, 0.003, 0.004, and any combination thereof.

[0095] Although embodiments of this invention have been fully described with reference to the accompanying drawings, it is to be noted that various changes and modifications will become apparent to those skilled in the art. Such changes and modifications are to be understood as being included within the scope of embodiments of this invention as defined by the appended claims. No single feature is considered essential or necessary to the invention. Instead, the invention includes exemplary features that may be used in one or more combinations are provided herein. The scope of the invention should be determined by the claims only, and not limited by the exemplary embodiments provided herein.

What is claimed is:

1. A hairbrush, comprising:

a base having a front side and a back side;
a tapered end; and
a handle;

one or more sets of projections projecting from and away from the base on the front side; and

one or more ridges that project across a latitudinal axis of the hairbrush, away from the base on the back side.

2. The hairbrush according to claim 1, wherein the one or more sets of projections align into one or more columns across a latitudinal axis of the hairbrush and one or more rows across a longitudinal axis of the hairbrush, and each of the one or more ridges aligns with one of the one or more columns of projections.

3. The hairbrush according to claim 2, wherein the one or more sets of projections comprise one or more heated sets of projections and one or more non-heated sets of projections and wherein a length of the one or more heated sets of projections is 40-75% of the length of the one or more non-heated sets of projections.

4. The hairbrush according to claim 2, wherein the one or more sets of projections comprises at least a first and second set of projections, where the first set of projections define a row and the second set of projections defined another row, where the row and another row are on opposing lateral portions of the base and comprise fully non-heated projections, and the first and second set of projections are configured to move relative to the base.

5. The hairbrush according to claim 4, wherein at least a portion of the one or more non-heated sets of projections define an outer perimeter around the one or more heated sets of projections such that no projections from the heated sets of projections defines the outer perimeter.

6. The hairbrush according to claim 3, wherein the base further comprises one or more heating elements that provide heat to the one or more heated sets of projections.

7. The hairbrush according to claim 6, wherein the one or more sets of projections further comprises a partially heated set of projections in which a heated portion extends away from the base and a non-heated protection that extends further outward from the base than the heated portion, wherein the non-heated set of projections are fully non-heated, the heated set of projections are fully heated, and the partially heated set of projections are heated along a portion of one end and not heated along a portion of another end.

8. The hairbrush according to claim 7, wherein the heated portion of the partially heated set of projections circumferentially surrounds the non-heated portion such that the non-heated portion extends through the heated portion.

9. The hairbrush according to claim 8, further comprising a plurality of inserts in which the plurality of inserts support the plurality of projections, in which the plurality of inserts are coupled to the base by a plate such that the plurality of inserts are positioned between the plate and the base, and the plurality of projections extends from the plurality of inserts through cavities in the plate.

10. The hairbrush according to claim 9, wherein a first set of columns of the one or more columns includes a heated projection, a non-heated projection, and a partially heated projection.

11. The hairbrush according to claim 10, wherein a second set of columns of the one or more columns includes a non-heated projection and a partially heated projection.

12. The hairbrush according to claim 9, wherein at least a portion of a first row of projections comprises alternating non-heated projections and partially heated projections.

13. The hairbrush according to claim 9, wherein at least a portion of a second row of projections comprises alternating partially heated projections and fully heated projections.

14. The hairbrush according to claim 1, wherein the one or more ridges comprise an interior portion that is adjacent to the base and heated and a terminal portion that is an exterior edge of the ridge and non-heated.

15. A hairbrush, comprising:

a first surface of a base;

a second surface of the base opposite the first surface; and one or more inserts;

one or more extensions extending from the one or more inserts, the one or more extensions configured to align into one or more columns across a latitudinal axis of the hairbrush; and

one or more ridges that project from the second surface and across the latitudinal axis of the hairbrush and away from the first surface, the one or more ridges align with the one or more columns of extensions.

16. The hairbrush according to claim 15, wherein the one or more extensions comprise one or more heated extensions along an entire length of the heated extension, one or more non-heated extensions along an entire length of the non-heated extension, and one or more partially heated extensions including a heated portion and non-heated portion along an entire length of the partially heated extension, wherein a length of the one or more heated extensions is 40-75% of the length of the one or more non-heated extensions.

17. The hairbrush according to claim 16, wherein the first side of the base further comprises one or more upward projections that are heated and a length of the one or more upward projections is 40-75% of the length of the one or more extensions.

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