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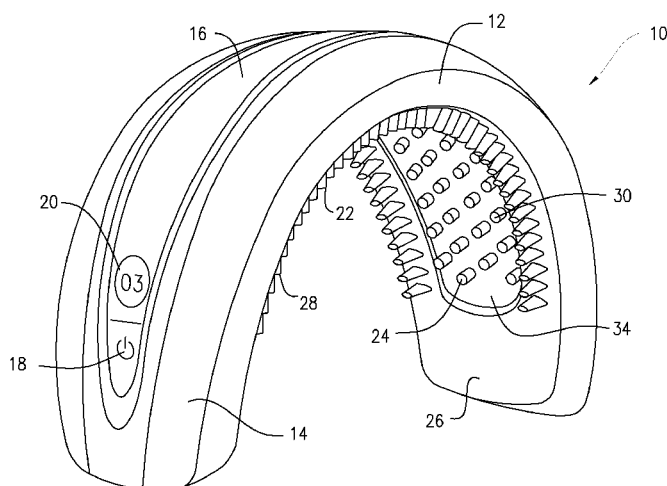


FIG. 7

(57) Abstract: A light emitting device for a human having a scalp with hair, the device includes a flexible arcuate base configured to contour a portion of the scalp. The base has a width between 20mm and 120mm and includes an interior and an exterior surface. At least one array of teeth is coupled to the interior surface, each tooth in the at least one array of teeth being pressed against the scalp when the base is contoured about the scalp. Each tooth is configured to part the hair when the at least one array of teeth is pressed against the scalp. An array of at least one of light emitting diodes and laser diodes coupled to the base proximate the at least one array of teeth.



LIGHT EMITTING HANDS FREE DEVICE

TECHNICAL FIELD

The present invention relates to light emitting hands free devices to stimulate hair growth.

5 BACKGROUND

Laser emitting combs and helmets have been devised to treat hair loss or otherwise stimulate new hair growth. Such devices, however, either provide for a single angle and/or position that therapeutic light can be emitted to the scalp, such as in a stationary helmet in which light may be obstructed by the user's existing hair, or
10 require the user to remember which areas of the scalp were treated as the device is moved over the scalp, such as in a hair comb. In either case, there is a difficulty in ensuring that the entire scalp is treated with light with limited user involvement.

Helmet devices having lasers extending from the helmet toward the scalp have been devised to provide for hand-free light treatment of the scalp. However, such
15 devices are not movable about the scalp, they simply press down onto the scalp or hair when the helmet is worn by the user. Thus, helmet devices provide no mechanism to part the user's existing hair such that the light reaches the scalp, but rather are limited to delivering light to wherever the helmet is positioned on the scalp, which may be obstructed by the user's hair.

20 SUMMARY

The present application provides a light emitting device for a human having a scalp with hair, the device includes a flexible arcuate base configured to contour a portion of the scalp. The base has a width between 20mm and 120mm and includes an interior and an interior surface. At least one array of teeth is coupled to the interior
25 surface, each tooth in the at least one array of teeth being pressed against the scalp when the base is contoured about the scalp. Each tooth is configured to part the hair when the at least one array of teeth is pressed against the scalp. An array of at least one of light emitting diodes and laser diodes coupled to the based proximate the at least one array of teeth.

30 In another embodiment, a hair growth system for use with a human scalp having hair is included, the system includes a base configured to contour the scalp, the base including an interior and an interior surface and has a width of between 20mm

and 120mm. At least two arrays of teeth are coupled to the interior surface, each tooth in the at least two arrays of teeth is pressed against the scalp when the base is contoured about the scalp. Each tooth is configured to part the hair when the at least two arrays of teeth are pressed against the scalp. An array of laser diodes is disposed
5 within the interior between the at least two arrays of teeth. A control unit is in communication with and remote to the base, the control unit being configured to activate the array of laser diodes.

In yet another embodiment, the system includes a flexible arcuate base configured to contour the scalp, the base including an interior and an interior surface
10 and having a width between 20mm and 120mm. At least two arrays of teeth coupled to the interior surface, each tooth in the at least two arrays of teeth being pressed against the scalp when the base is contoured about the scalp. Each tooth is configured to part the hair when the at least two arrays of teeth are pressed against the scalp. An array of laser diodes is disposed within the interior between the at least two arrays of
15 teeth. The base is movable from a first position on the scalp to a second position of the scalp without the at least two arrays of teeth losing contact with the scalp. A resilient element is coupled to at least one of the at least two arrays of teeth, the resilient element configured to facilitate the movement of one of the at least two arrays of teeth from a first position away from the interior surface to a second position
20 adjacent the interior surface. An image capture element is coupled to the base, the image capture element being configured to capture one or more images of the scalp when the base is contoured about the scalp. A control unit in communication with and remote to the base is included, the control unit being configured to activate the array of laser diodes; the control unit includes a processor configured to compare the
25 captured one or more images of the scalp and determine the extent of follicle density and compile the one or more images of the scalp and determine whether substantially the entirety of the scalp has been exposed to light emitted from the array of laser diodes.

BRIEF DESCRIPTION OF THE DRAWINGS

30 A more complete understanding of the present invention, and the attendant advantages and features thereof, will be more readily understood by reference to the

following detailed description when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a front view of a light emitting hands free device constructed in accordance with the principles of the present application;

5 FIG. 1B is a top view of the light emitting device shown in FIG. 1A;

FIG. 1C is a side view of the light emitting device shown in FIG. 1A;

FIG. 2A is a side and inside-out surface view of an embodiment of the light emitting device shown in FIG. 1A;

10 FIG. 2B is a side and inside-out surface view of an embodiment of the light emitting device shown in FIG. 1A;

FIG. 2C is a side and inside-out surface view of an embodiment of the light emitting device shown in FIG. 1A;

FIG. 3 is a side perspective component view of two arrays of teeth coupled to the base of the device shown in FIG. 1A;

15 FIG. 4A is a side inside-out surface view of the embodiment of the light emitting device shown in FIG. 2A;

FIG. 4B is a side inside-out surface view of the embodiment of the light emitting device shown in FIG. 4B;

20 FIG. 4C is a side inside-out surface view of the embodiment of the light emitting device shown in FIG. 2C;

FIG. 5A is a side view of an embodiment of the light emitting device shown in FIG. 1A;

FIG. 5B is a side inside perspective view of the embodiment of the light emitting device shown in FIG. 1A;

25 FIG. 6 is a side perspective view of another embodiment of a light emitting device constructed in accordance with the principles of the present application.

FIG. 7 is a side perspective view of another embodiment of the light emitting device constructed in accordance with the principles of the present application being disposed around a user's head and in communication with a portable electronic

30 device; and

FIG. 8 is side perspective of the embodiment shown in FIG. 7 with one array of teeth.

DETAILED DESCRIPTION

As used here, relational terms, such as “first” and “second,” “over” and “under,” “front and rear,” and the like, may be used solely to distinguish one entity or element from another entity or element without necessarily requiring or implying any physical or logical relationship or order between such entities or elements.

Referring now to the drawings in which like reference designators refer to like elements, there is shown in FIGS. 1A-1C and exemplary light emitting hands free device constructed in accordance with the principles of the present application and designated generally “10.” The device 10 may be constructed of rigid materials such as polycarbonate and/or other elastic and resilient materials, such as thermoplastic polyurethane, or metals and metal alloys. In particular, the device 10 may include an elongate base 12 biased in a substantially arcuate or semi-circular configuration. In particular, the base 12 may include an exterior surface 14 composed of a resilient material shaped in substantially the same arc defined the top of human scalp extending between the user’s two ears. The base 12 may extend from a position just above the user’s left ear, across the scalp, and terminate at a position just about the user’s right ear. In an exemplary configuration, the length of the base 12 is between approximately 175-240mm and the width of the base is approximately 20-120mm. The base 12 may define a sloped or curved surface along its width. For example, as shown in FIG. 1C, the base 12 may increase in height to a maximum height of approximately 140mm as it extends from the front of the user’s scalp to the back of the user’s scalp and then may decrease in height as it extends toward the posterior of the scalp. It is contemplated that the base 12 may define any slope along its width or length to facilitate a proper contour of the base 12 about the user’s scalp. For example, the base 12 may include an extension element (not shown) configured to provide an adjustment in the overall length of the base 12 to accommodate differently sized scalps. The extension element may, for example, a telescoping member or resilient elastic member disposed within the interior of the base to increase the length of the base 12 as needed.

The base 12 may include a power panel 16 extending at least a portion of the length of the base 12, and in one configuration, substantially the entire length of the

base 12. In the embodiments shown in FIGS. 1A-1C, the power panel 16 is positioned at approximately the center of the width of the base 12 and may be identified by a different color than that of the remainder of the base 12. The base 12 may define a recess (not shown) sized to receive the power panel 16. In one
5 embodiment, the power panel 16 is releasably affixable to the base 12 within the recess such that it may be modular. In particular, the power panel 16 may readily snap into and out of the base 12 to connect the power panel 16. In other embodiments, the power panel 16 is permanently affixed to the base 12. The power panel 16 may include a rechargeable battery (not shown) such as a lithium ion battery,
10 or a non-rechargeable battery, in communication with the various powered components of the device 10 discussed in more detail below, an on/off power switch 18, a timer 20, and a vibration adjustment actuator (not shown).

Referring now to FIGS. 1A, and 2A-2C, the device 10 may include a plurality of teeth 22 and a plurality of diodes 24 disposed an interior surface 26 of the base 12.
15 The plurality of teeth 22 may be composed of a resilient or rigid material, for example polyurethane or polycarbonate, and a define a blunted edge as to be atraumatic to the scalps is the interior surface is positioned on and/or moved across the user's scalp. In an exemplary configuration, each of the plurality of teeth 22 taper inward in width as they extend away from the interior surface 26. The plurality of teeth 22 may be
20 arranged in one or more arrays along the interior surface 26. For example, as shown in FIG. 2A, the plurality of teeth 22 are arranged in three substantially linear teeth arrays 28 along the interior surface 26. The teeth arrays 28 may be substantially parallel to one another and substantially equidistant from an adjacent teeth array 28. In the configuration shown in FIG. 2A, each teeth 22 in the teeth array 28 is spaced
25 approximately 7mm from an adjacent tooth 22 and span substantially then entire length of the interior surface 26 of the base 12. Each tooth 22 may be configured to part the user's hair as the base 12 is moved over the user's scalp, or to part hair while the base 12 is stationary over a particular part of the user's scalp. For example, the base 12 may be pivoted about the user's scalp, from front to back or from back to
30 front, to a desired treatment region on the user's scalp while each tooth 22 maintains contact with the user's scalp and/or hair. The pivot point may be the ends of the base 12 proximate the ears. As the base 12 is moved over the user's scalp to a desired

position, the user's hair may be pinned down or otherwise parted by the teeth 22 to provide for at least a substantially unobstructed pathway for the light emitted from the diodes 24 to treat the user's scalp.

Referring now to FIG. 3, one or more of the arrays 28 may further include a resilient element 29 positionable proximate the interior surface 26 and the array 28. The resilient element 29, which may be a spring or an elastic material, may facilitate the movement of the respective array 28 from a first position away from the interior surface 26 to a second position adjacent the interior surface 26. In particular, when the array 28 is coupled to the base 12, the resilient element 29 is disposed between the interior surface and the array 28, for example, as protrusion extending away from the array 28. When the user positions the base 12 onto the scalp, the resilient element 29 may be pressed against the interior surface 29 which allows the flexion of the respective array 28 where the force is applied, which may provide for comfort around the scalp and/or a better fit of the array 28 to the scalp.

Referring back now to FIGS. 2A-2C, each teeth array 28 may be spaced approximately 30mm, for example, a range from 10mm-50mm, from an adjacent teeth array 28 to provide for a particular arrangement of diodes 24. For example, as shown in FIG. 2A, the diodes 24, may be arranged in diode arrays 30 similar to the teeth arrays 28. In the configuration shown in FIG. 2A, each diode 24, which may be a laser or light emitting diode, at any wavelength of light, or a combination of wavelengths of light, for example, multi-chromatic light, two diode arrays 30 may be disposed between two teeth arrays 28 for a total of four diode arrays 30. One diode array 30 may emit laser light, while another may emit white light, or a light at a particular wavelength, for example, yellow, green, red, blue, infrared and in the wavelengths of approximate 610-690nm, 400-500nm, 800-900nm, and 1000-1200nm. For example, one diode array 30 may contain diodes 24 emitting light in the wavelength of 610-690nm and another diode array 30 may contain diodes 24 emitting light in the wavelength of 1000-1200nm. Alternatively, all the diodes 24 may emit light at a first wavelength and may be modular with diodes 24 or diode arrays 30 configured to emit light at a second wavelength different than the first wavelength.

In the configuration shown in FIG. 2A, each diode array 30 is substantially parallel to every other diode array 30 and may be longitudinally offset from an

adjacent diode array 30 and/or every other diode array 30. For example, FIG. 2A shows a configuration of the device 10 with four diode arrays 30, each array having a 22 diodes for a total of 82 diodes 24. The diodes 24 may be positioned such that each diode 22 has a different vertical and/or horizontal orientation than each and every other diode 24, such that each diode 24 targets a different area of the scalp. In other configurations, a single array of teeth 28 may be included along any horizontal positional, with diodes 24 disposed in arrays 30 on one or both sides of the array 28 such that the array 28 and the diodes are substantially parallel to each other, although any configuration and placement of the arrays 30 and one or more arrays 28 are contemplated.

In the configuration shown in FIG. 2B, two diode arrays 30 may be disposed between two teeth arrays 28 for a total of four diode arrays 30, however, half the number of diodes 24 are included in each diode array 30. In particular, in each diode array 30, 11 diodes are included as opposed to 22 diodes per diode array 30 as shown in FIG. 2A. To achieve the configuration shown in FIG. 2B, the power panel 16 shown in FIG. 2A may be substituted for the power panel 16 shown in FIG. 2B, or alternatively, the diodes 24 may be deactivated by the user for a particular treatment optionally programmed into the power panel 16 such that every other diode 24 is deactivated. Alternatively, the deactivated diodes 24 may be replaced by nubs or other non-electric material to space the activated diodes 24 from one another. Similar to FIG. 2B, the configuration shown in FIG. 2C includes four diode arrays 30 of 11 diode with half of the diodes 24 in each diode array 30 being deactivated. In particular, each diode array 30 includes 11 consecutive diodes 24 that are activated followed by eleven consecutive deactivated diodes 24 or other non-electric material. As shown in FIG. 2C, each diode array 30 includes the opposite configuration of activated diodes 24 compared to an adjacent diode array 30.

Now referring to FIGS. 4A-4C, 5A-B, and FIG. 6, the teeth arrays 28 may be disposed in channels 32 defined by the base 12. In particular, each tooth 22 may extend away from the interior surface 26 from one channel 32 such that each teeth array 28 defines an arcuate configuration. Each diode 24 is positioned between at least two teeth 22 to facilitate the light emitted from each diode 24 being substantially unobstructed when a beam of laser light or non-laser light is emitted to the scalp.

Alternatively, no channels 32 may be included and the proximal end of each tooth 22 may be substantially planar to a corresponding diode 24. Alternatively, each diode 24 and each diode array 30 may be recessed with respect to the arrays of teeth 28. For example, each diode 24 may be enclosed within an interior of the base 12, for
5 example, by a transparent cover, that allows light to be emitted from each diode 24 while maintaining a smooth interior surface 26. In such a configured, the base may be watertight or substantially watertight such that water does not enter the interior to damage the diodes 24.

In the configuration shown in FIG. 7, two arrays of teeth 28 are disposed on
10 the interior surface 26. In FIG. 8, one array of teeth 28 is included adjacent the diode arrays 30 and may be on either side of the diode arrays 30. In either configuration, each array of teeth 28 is configured to part the users hair as the base 12 is moved and/pivoted about the scalp. In the configuration shown in FIG. 7, the arrays of teeth 28 are disposed toward the edges of the interior surface 26 creating a single channel
15 32 substantially spanning the width between the two arrays of teeth 28 and substantially spanning the length of the base 12. Removeably insertable within the channel 32 may be modular band 34 lockingly engageable within the channel 32. The band 34 may snap-fit within the channel 34 and be in electrical communication with the power panel 16 when inserted within the channel 34. Affixed to the band 34 are
20 the plurality of diodes 24 and arrays 30, which may be arranged in any pattern and any number of arrays 30. For example, four arrays 30 are included in the embodiment in FIG. 7. It is further contemplated that other bands 34 may be snap-fit within the channel 34 to provide for a particular configuration of diodes 24, which may each emit light in a particular wavelength range of light as discussed above. In such a
25 configuration, the modular band 34 may form a water tight seal within the interior surface 26.

In an exemplary method of use of any of the above-described embodiments, the user positions the interior surface 26 over a front portion of the scalp and activates the device 10 with the on/switch 18, or remotely, as discussed in more detail below,
30 which activates the timer 20 to count down from a predetermined treatment time. For example, the diode arrays 30 may be activated for 3 minutes, or any duration, and then turn off. During those three minutes, the teeth arrays 28 may vibrate to aid in the

part of the hair and/or provide gentle massage to the scalp. In a particular configuration, neither the teeth 22 nor the user's hair obstruct the pathway of light emitting from the diodes 24. After the predetermined amount of time, an alert may sound to indicate to the user that the predetermined time period has concluded. The user may then pivot or otherwise move the device 10 to a different orientation of the scalp, for example the front of the scalp, the middle of the scalp (as shown in FIG. 6) or the rear of the scalp and continue treatment for an additional predetermined amount of time without removing the device 10 from the scalp and/or losing contact with the teeth 22 from the scalp or hair such that the hair may be parted by the teeth 22 to create an unobstructed, or substantially unobstructed, light path from the diodes 24 to the scalp. In particular, the user may shift the base 12 from a first position proximate the center of the scalp to a second position proximate the front or rear of the scalp without disengaging the base 12 from being pressed against the scalp.

Continuing to refer to FIG. 6, the device 10, and in particular the panel 16, may be in communication with a control unit 36 configured to activate and control the device 10 and optionally monitor treatments associated with the device 10. The control unit 36 may be a watch with a wireless transmitter, for example, the Apple Watch™, or a Smartphone, tablet computer, or a computer running application software configured to communicate with the device 10. In particular, the device 10 may include a wireless transmitter/receiver 38 in communication with a processor 40 in the base 12 configured to process the various commands received from the control unit 36. For example, the Smartphone, such as an iPhone™, may have an application configured to be operable by the user to turn on/off the device 10, activate the diodes 24, turn on/off the timer of the device, turn on/off the teeth arrays 28, activate and image capture element 42 coupled to the base 12, and dispense a fluid from the base 12. In a particular configuration, the image capture element 42, which may be a camera be coupled to the interior surface 26, may be configured to image sections of the scalp, when the base 12 is disposed or otherwise contoured about the user's scalp. The image capture element 42 may be substantially planar with the interior surface 26 as to not protrude a distance away from the interior surface 26. Alternatively, the image capture element 42 may protrude a distance away from the interior surface and may be positioned on a gimbal or structure configured to allow

multiple axes of movement of the image capture element 42. Although not shown, the base 12 may also be foldable. For example, the base 12 may include a hinge proximate one or both ends of the base proximate the ears of a user when the device 10 is placed on a user's scalp. The hinge may allow for a portion of the base to fold
5 to an angle of at least 90 degrees to allow the device 10 to be laid flat and stand on its own on a surface.

The software application in the control unit 36 may be in communication with the image capture element 42 and may activate the image capture element 42 either automatically when the device 10 is activated or manually by the user. In an
10 exemplary configuration, when the user uses the device 10, the image capture device 42 captures an image of a section of the scalp. The image of the scalp is then analyzed to determine an average density of hair follicles and/or extent of hair growth in that imaged section. Each time the user uses the device 10 and treats the scalp with laser and/or light 26 diodes, the image capture element 42 captures an image of the
15 treated section and compares it overtime. The change in follicle density is calculated overtime such and displayed on the display of the control unit such that the user can track the progress of treatments. For example, images captured by the image capture element 42 may be compiled to determine if the entire scalp and/or the desired portion of the scalp has been treated with light therapy and the extent of hair growth/follicle
20 density on the scalp as a whole or a target portion of the scalp. The application may further be configured to calculate the change in follicle density and/or extent of hair growth based on a number of factors. For example, the application may include an algorithm that correlates the extent of hair growth and/or follicle density based on at least one of a frequency of use of the base 12, a duration of time per each use of the
25 base 12, and the one or more captured images of the scalp. The user may further be able to track his/her progress over time to identify areas of the scalp that may require longer treatment times or a different light intensity. The base 12 may further include a reservoir 46 configured to store a hair growth stimulating fluid. The control unit 36 may be in communication with the reservoir 46 and configured to dispense fluid from
30 the reservoir 46 either out through an aperture in the base 12 in fluid communication with the reservoir 46, or alternatively out through one or more teeth 22, which may have apertures at their respective distal ends in communication with the reservoir 46.

Moreover, the user data may be stored in the application and a user profile generated based on the data, such that multiple users may use the device 10 and a user specific treatment program may be tailored for the individual needs of the user. For example the algorithm may determine for a particular user that the treatment time may
5 need to be increased proximate the top of the scalp, as opposed to the front or back, and initiate a treatment program targeted toward hair growth in that particular region. To further determine that that the device 10 is moved or otherwise pivoted at a desired velocity about the scalp, the base 12 may include an accelerometer 44 in communication with the processor 40 to record the speed and/or acceleration at which
10 the device is moving. If the device is moved above or below a predetermined speed, the device may vibrate or otherwise alert the user through a sound from the device or alert from the Smartphone 36 to increase or decrease the speed of parting the user's hair with the teeth array 28.

It will be appreciated by persons skilled in the art that the present invention is
15 not limited to what has been particularly shown and described herein above. In addition, unless mention was made above to the contrary, it should be noted that all of the accompanying drawings are not to scale. A variety of modifications and variations are possible in light of the above teachings without departing from the scope and spirit of the invention, which is limited only by the following claims.

What is claimed is:

1. A light emitting device for a human having a scalp with hair,
comprising:
a flexible arcuate base configured to contour a portion of the scalp, the base
5 having a width between 20mm and 120mm, the base including an interior and an
interior surface;
at least one array of teeth coupled to the interior surface, each tooth in the at
least one array of teeth being pressed against the scalp when the base is contoured
about the scalp, each tooth being configured to part the hair when the at least one
10 array of teeth is pressed against the scalp; and
an array of at least one of light emitting diodes and laser diodes coupled to the
based proximate the at least one array of teeth.
2. The device of Claim 1, wherein the at least one array of teeth includes
15 at least two arrays of teeth, and wherein the at least two arrays of teeth and the array
of at least one light emitting diodes and laser diodes are substantially parallel to each
other, and wherein the array of at least one light emitting diodes and laser diodes is
disposed between the at least two arrays of teeth.
- 20 3. The device of Claim 2, wherein the at least two arrays of teeth are
removeably coupled to the interior surface.
4. The device of Claim 3, further including a resilient element disposed
between the interior surface and one of the at least two arrays of teeth, the resilient
25 element configured to facilitate the movement of one of the at least two arrays of teeth
from a first position away from the interior surface to a second position adjacent the
interior surface.
5. The device of Claim 1, further including a proximity sensor coupled to
30 the base, the proximity sensor being configured to automatically activate the array of
at least one of light emitting diodes and laser diodes when the user's scalp is a
predetermined distance away from the proximity sensor.

6. The device of Claim 1, further including an image capture element coupled to the base, the image capture element being configured to capture an image of at least a portion of the scalp when the base is contoured about the scalp.

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7. The device of Claim 1, further including a reservoir within the base configured to retain a hair growth stimulating fluid.

8. The device of Claim 1, wherein the base includes a battery configured to be charged by an inductive charging element.

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9. The device of Claim 1, wherein the base defines a substantially watertight seal around the array of at least one of light emitting diodes and laser diodes.

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10. The device of Claim 1, wherein the base defines a length, wherein the at least one array of teeth and the array of at least one light emitting diodes and laser diodes span substantially the entire length of the base.

11. The device of Claim 1, wherein the at least one array of teeth is configured to part the hair of the scalp when the base is moved from the first position on the scalp to the second position of the scalp.

20

12. The device of Claim 1, wherein the at least one array of light emitting diodes and laser diodes includes light emitting diodes, and wherein the light emitting diodes are configured to emit light in the wavelength range of at least one 610-690nm, 400-500nm, 800-900nm, and 1000-1200nm.

25

13. A hair growth system for use with a human scalp having hair, comprising:

30

a base configured to contour the scalp, the base including an interior and an interior surface, the base having a width of between 20mm and 120mm;

at least two arrays of teeth coupled to the interior surface, each tooth in the at least

two arrays of teeth being pressed against the scalp when the base is contoured about the scalp, each tooth being configured to part the hair when the at least two arrays of
5 teeth are pressed against the scalp;

an array of laser diodes disposed within the interior between the at least two arrays of teeth; and

a control unit in communication with and remote to the base, the control unit being configured to activate the array of laser diodes.

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14. The system of Claim 13, further including a proximity sensor coupled to the base, the proximity sensor being configured to at least one of automatically activate the array of laser diodes when the user's scalp is a predetermined distance away from the proximity sensor and enable activation of the array of laser diodes by
15 the control unit.

15. The system of Claim 13, further including an image capture element coupled to the base, the image capture element being configured to capture one or more images of the scalp when the base is contoured about the scalp.

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16. The system of Claim 13, wherein the control unit includes a processor configured to determine an extent of hair growth based on at least one of a frequency of use of the base, a duration of time per each use of the base, and the one or more captured images of the scalp.

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17. The system of Claim 13, wherein the control unit includes a processor configured to compile the one or more images of the scalp and determine whether substantially the entirety of the scalp has been exposed to light emitted from the array of laser diodes.

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18 The system of Claim 13, wherein the base includes a reservoir configured to store a hair growth stimulating fluid, and wherein the control unit is in communication with the reservoir and configured to dispense fluid from the reservoir.

5 19. The system of Claim 13, wherein the base includes an accelerometer, and wherein the accelerometer is in communication with the control unit, and wherein the control unit is configured to measure the speed at which the base is moved about the scalp.

10 20. A hair growth system for use with a human scalp having hair, comprising:
 a flexible arcuate base configured to contour the scalp, the base including an interior and an interior surface, the base having a width between 20mm and 120mm;
 at least two arrays of teeth coupled to the interior surface, each tooth in the at
15 least
 two arrays of teeth being pressed against the scalp when the base is contoured about the scalp, each tooth being configured to part the hair when the at least two arrays of teeth are pressed against the scalp;
 an array of laser diodes disposed within the interior between the at least two
20 arrays of teeth;
 the base being movable from a first position on the scalp to a second position of the scalp without the at least two arrays of teeth losing contact with the scalp;
 a resilient element being coupled to at least one of the at least two arrays of teeth, the resilient element configured to facilitate the movement of one of the at least
25 two arrays of teeth from a first position away from the interior surface to a second position adjacent the interior surface;
 image capture element coupled to the base, the image capture element being configured to capture one or more images of the scalp when the base is contoured about the scalp; and
30 a control unit in communication with and remote to the base, the control unit being configured to activate the array of laser diodes; the control unit includes a processor configured to:

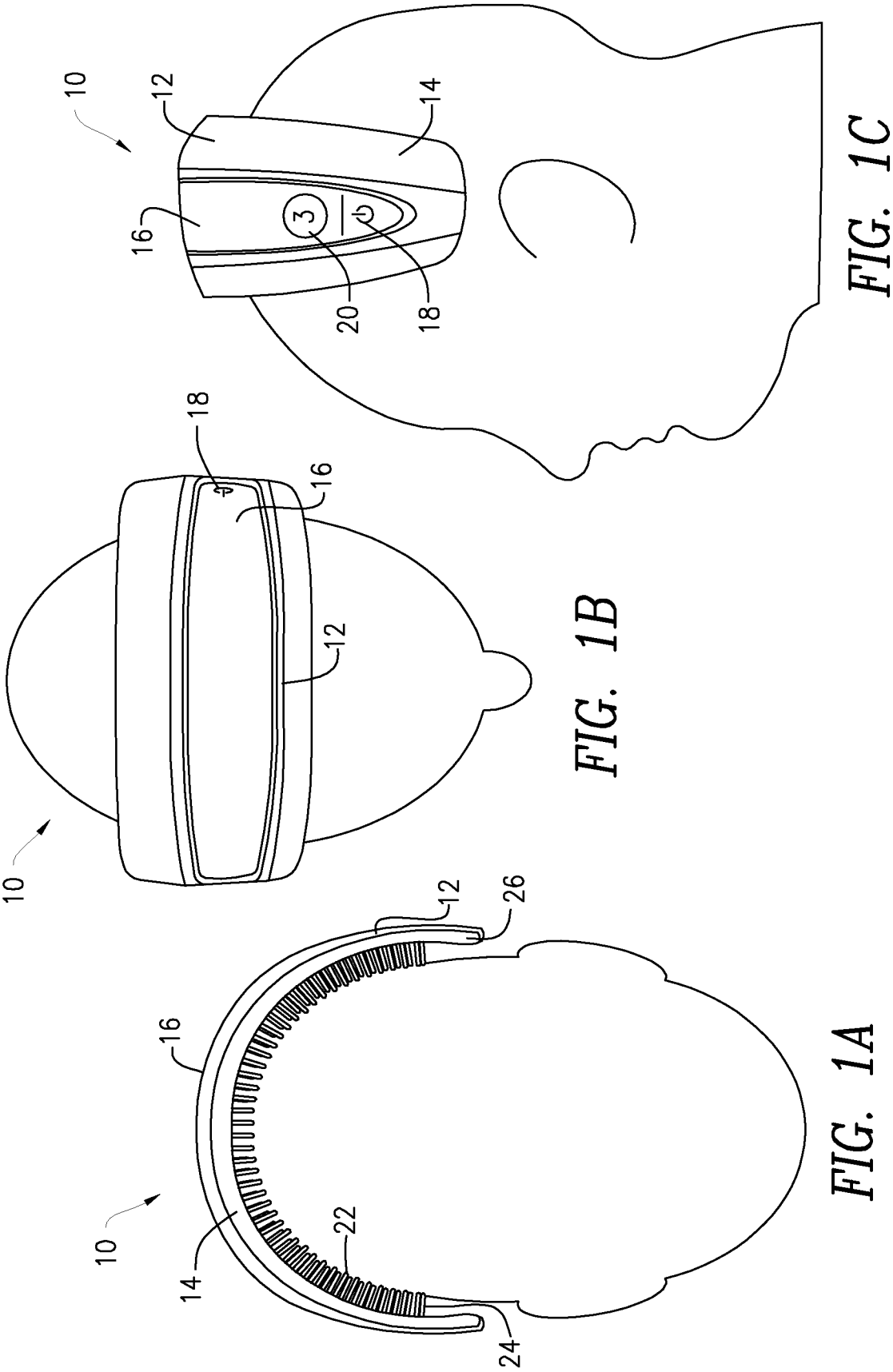
compare the captured one or more images of the scalp and determine the extent of follicle density; and

compile the one or more images of the scalp and determine whether substantially the entirety of the scalp has been exposed to light emitted from the array
5 of laser diodes.

21. The device of Claim 1, wherein the base is movable from a first position on the scalp to a second position of the scalp without the at least one array of teeth losing contact with the scalp.

10

22. The system of Claim 13, wherein the base is movable from a first position on the scalp to a second position of the scalp without the at least two arrays of teeth losing contact with the scalp.



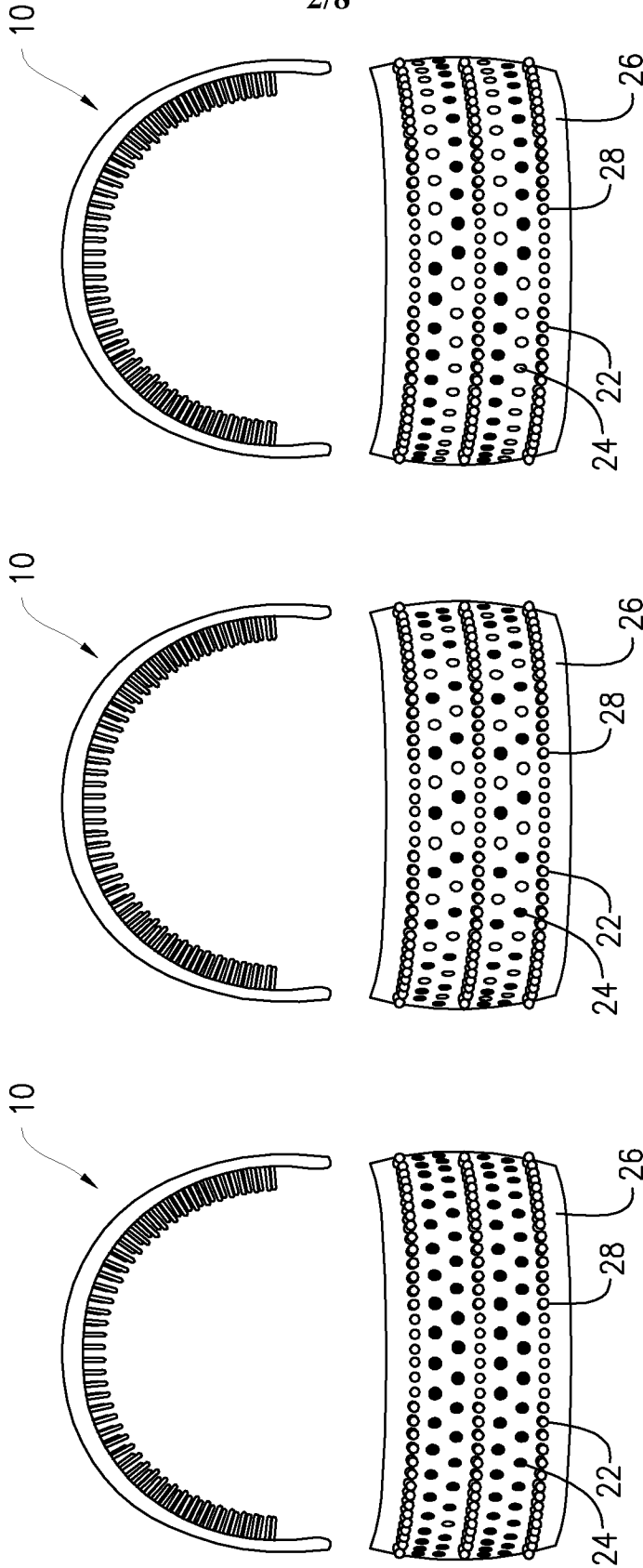


FIG. 2C

FIG. 2B

FIG. 2A

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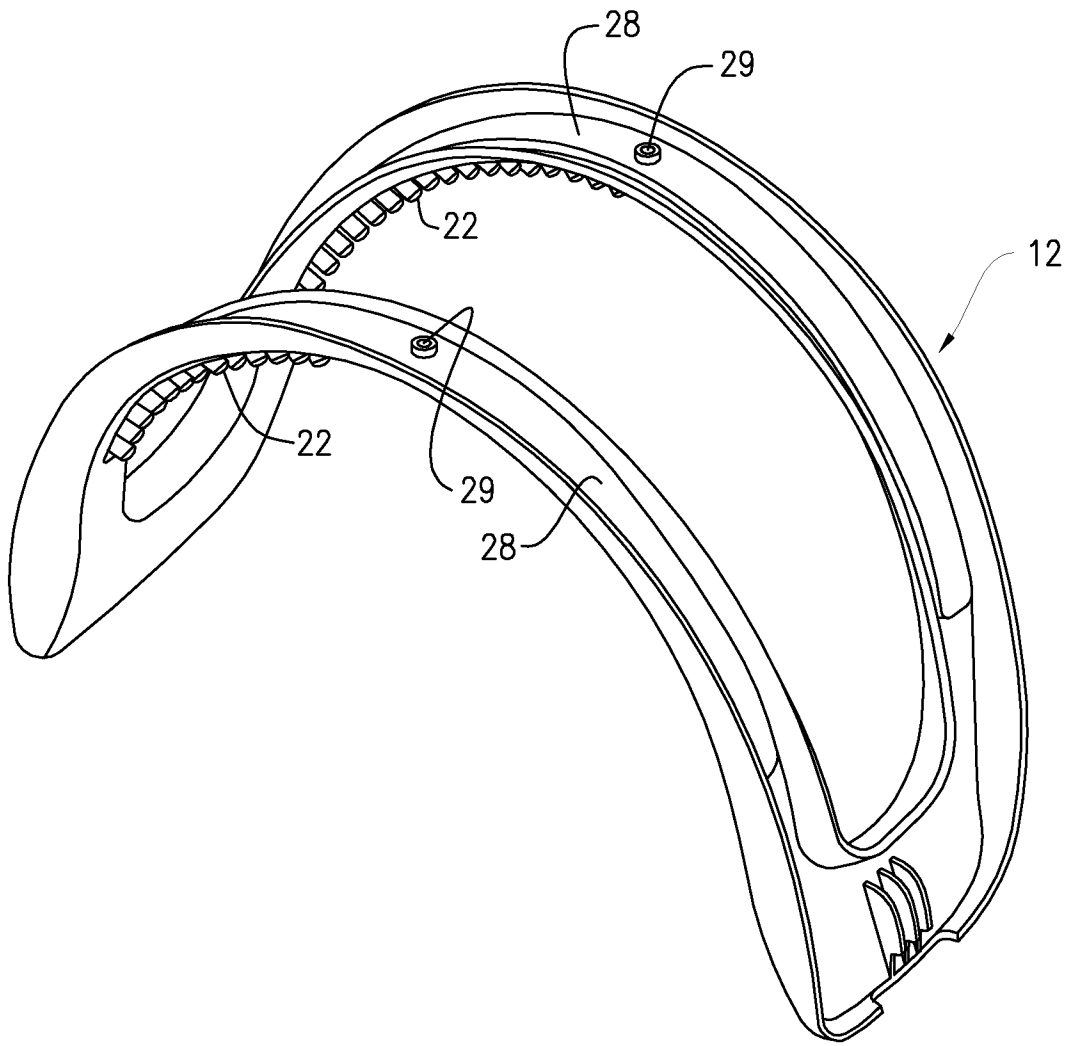


FIG. 3

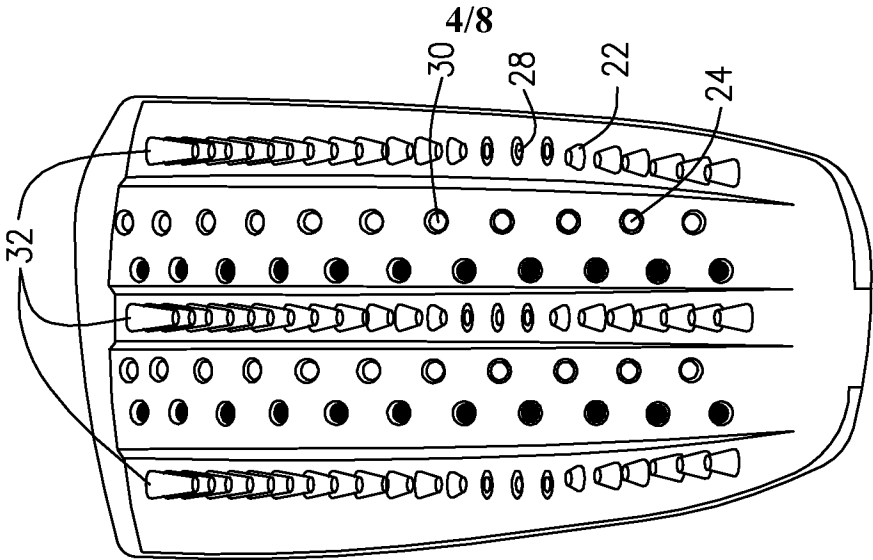


FIG. 4C

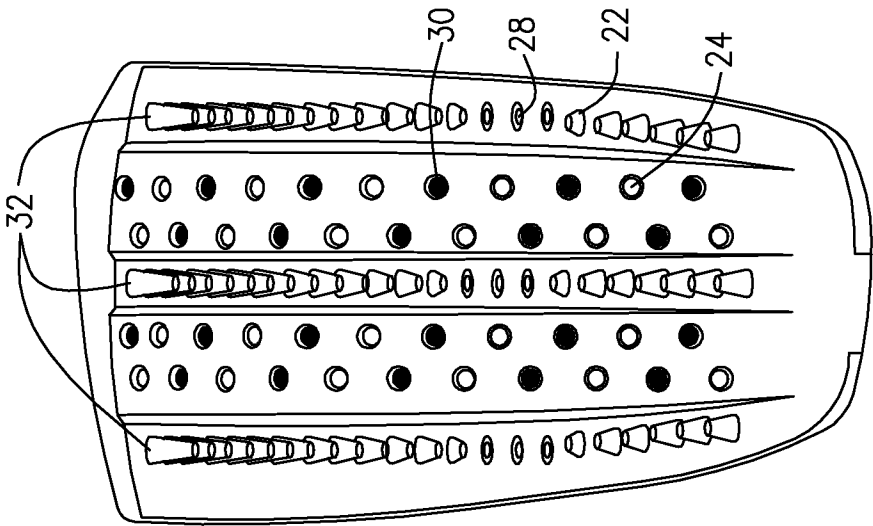


FIG. 4B

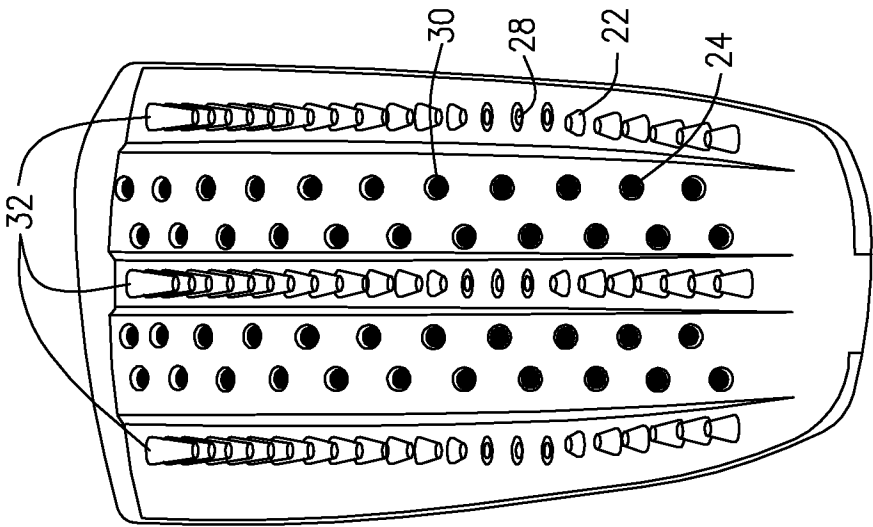


FIG. 4A

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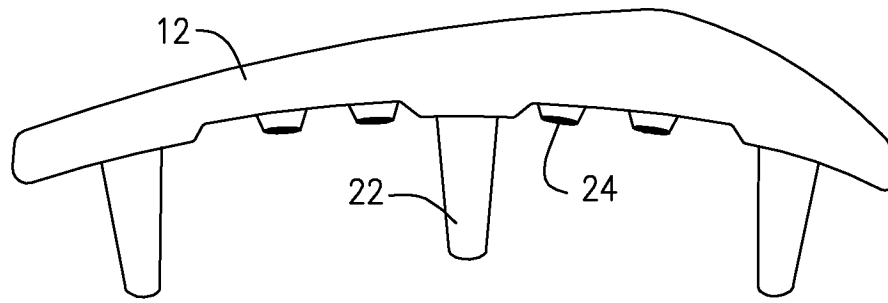


FIG. 5A

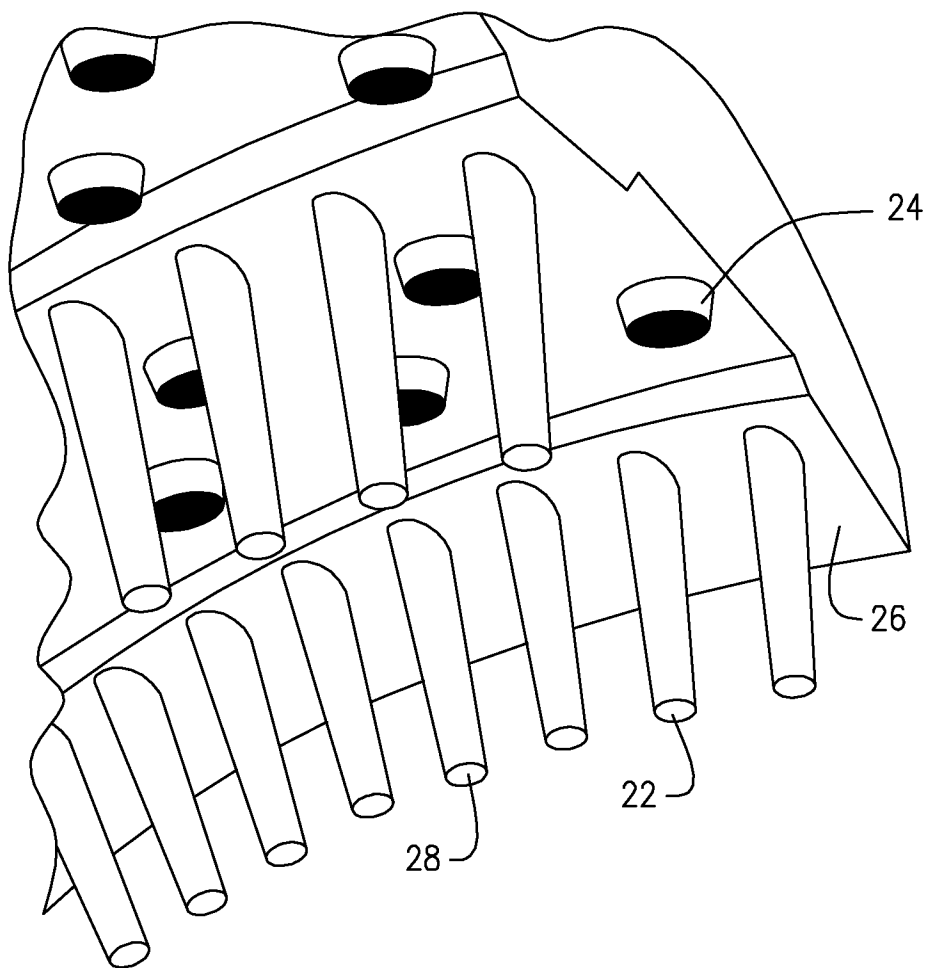


FIG. 5B

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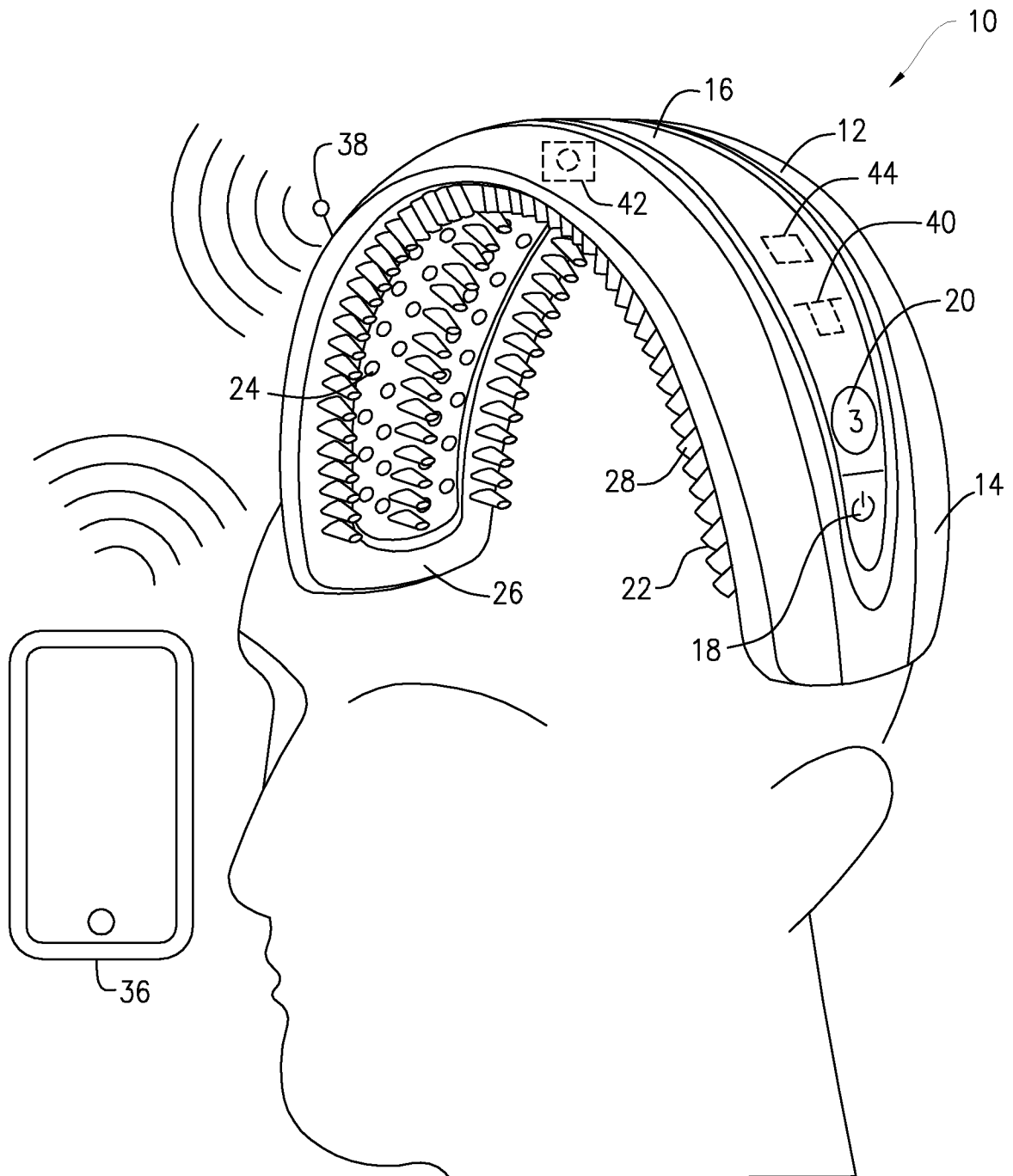


FIG. 6

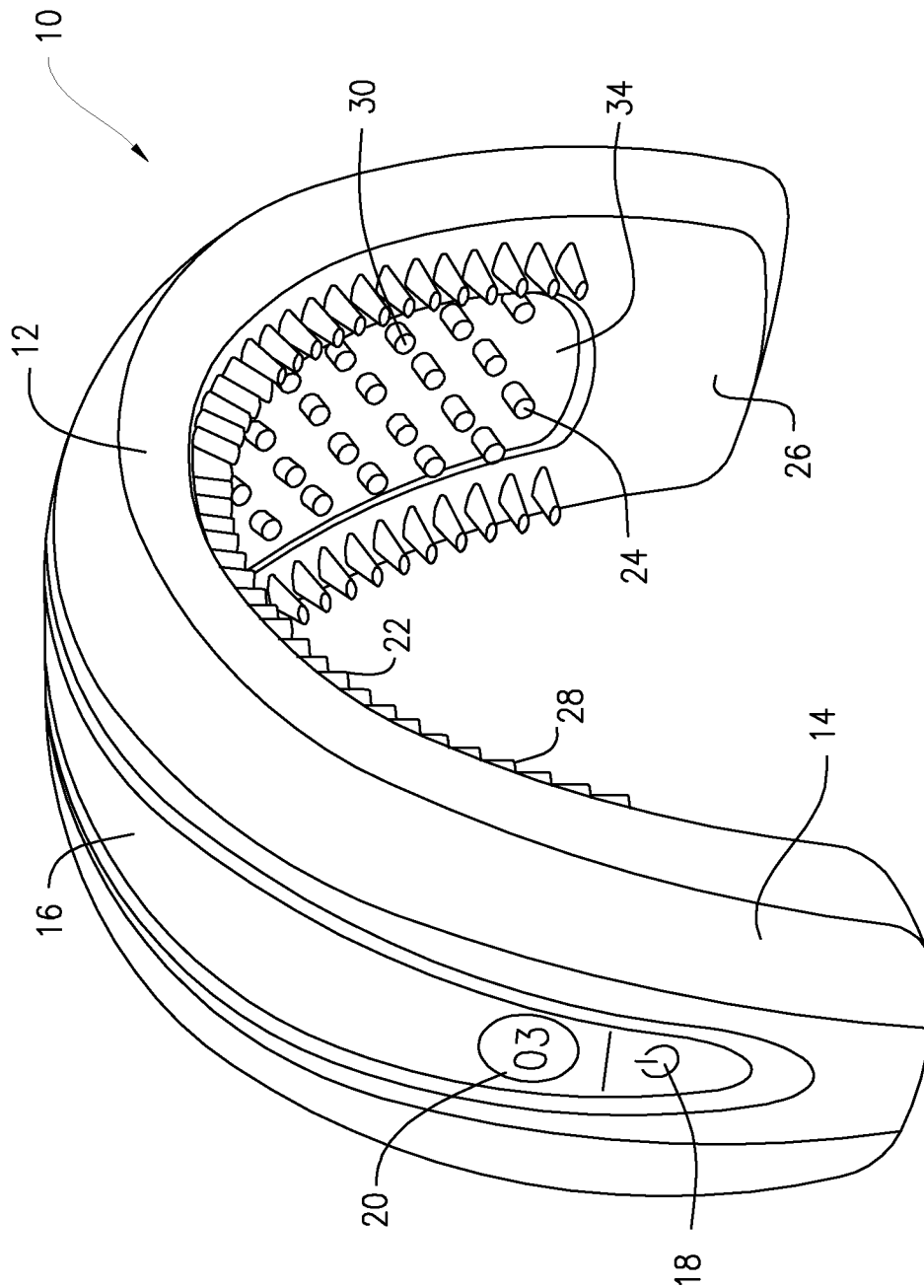


FIG. 7

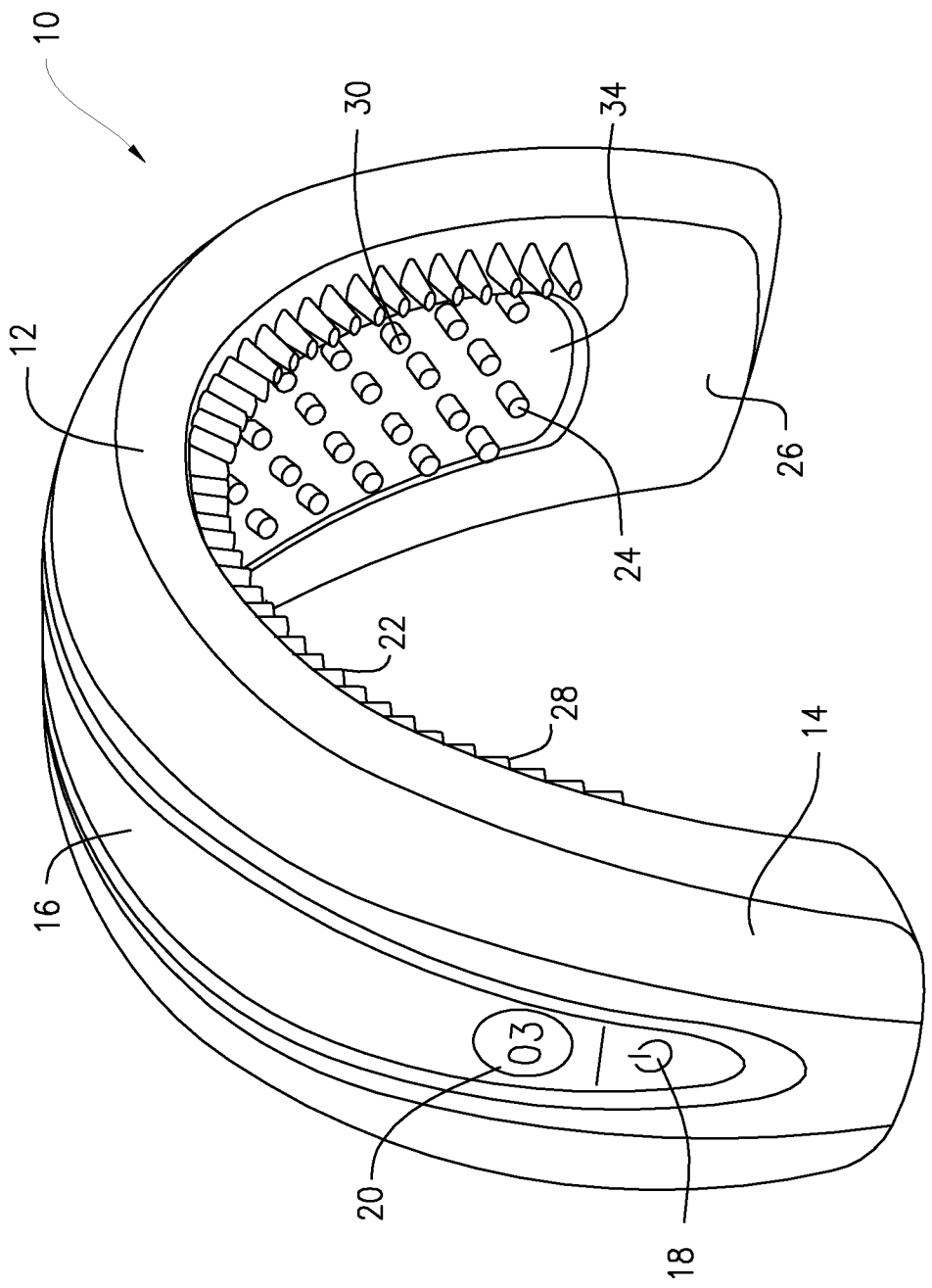


FIG. 8