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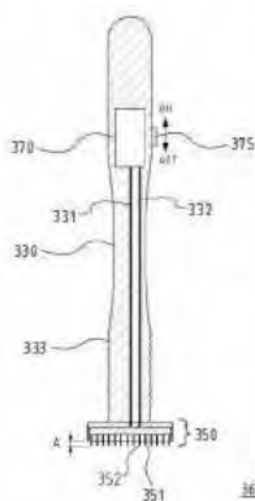
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(54) SKIN CARE METHOD, BEAUTY DEVICE, AND BEAUTY SYSTEM

(57) Abstract

The present invention describes, overall, an embodiment of a cosmetic procedure for skin cells. Other embodiments are also described and claimed.

Representative Drawing FIG. 2d



What is claimed is:

Claim 1

An electric acupuncture device comprising:

a flat plate member with a plurality of metallic dips inserted on one side;

a handle member coupled to the flat plate member on the central axis of the flat plate member; and

an electric input member coupled to the handle member and connected to a connection terminal from an electricity generating apparatus for conducting electricity to the plurality of metallic needles.

Claim 2

The electric acupuncture device of claim 1, wherein the flat plate member comprises an elastic member supporting the plurality of metallic needles.

Claim 3

The electric acupuncture device of claim 1, wherein the plurality of metallic needles form micro-holes in the skin of the treatment subject, and wherein the plurality of metallic needles electrically stimulate the dermis layer of the subject's skin with electricity from the electricity generating apparatus to increase the absorption rate of a substance for skin improvement in the subject's skin.

Claim 4

The electric acupuncture system of claim 1, wherein at the ends of the plurality of metallic needles, any one of the followings, i.e., ion, radio wave, ultrasound, high frequency, medium frequency, and low frequency, is generated by the electricity generating apparatus.

Claim 5

An electric acupuncture system comprising:

a flat plate member having a plurality of metallic needles inserted in a first surface, and wherein the plurality of metallic needles are electrified from the outside, and a tapping electric input member; and

an electricity generating apparatus for conducting electricity to a plurality of metallic needles of the electric acupuncture device via a connection connected to an electric input member of the electric acupuncture device.

Claim 6

The electric acupuncture system of claim 5, wherein the flat plate member comprises an elastic member supporting the plurality of metallic needles.

Claim 7

The electric acupuncture system of claim 5, wherein the plurality of metallic needles form micro-holes in the skin of the treatment subject, and wherein the plurality of metallic needles electrically stimulate the dermis layer of the subject's skin with electricity from the electricity generating apparatus to increase the absorption rate of a substance for skin improvement in the subject's skin.

Claim 8

The electric acupuncture system of claim 5, wherein at the ends of the plurality of metallic needles, any one of the followings, i.e., ion, radio wave, ultrasound, high frequency, medium frequency, and low frequency, is generated by the electricity generating apparatus.

Claim 9

An electric skin beauty device comprising:

a flat plate member with a plurality of metallic dips inserted on one side;

a handle member coupled to the flat plate member on the central axis of the flat plate member; and

a power supply for supplying a voltage to the plurality of metallic needles to conduct electricity to the plurality of metallic needles.

Claim 10

The electric skin beauty device of claim 9, wherein the flat plate member comprises an elastic member supporting the plurality of metallic needles.

Claim 11

The electric skin beauty device of claim 9, wherein the plurality of metallic needles form micro-holes in the skin of the treatment subject to increase the absorption rate of the skin-improving substance in the skin of the treatment subject, and wherein the plurality of metallic needles electrically stimulate the dermis layer of the skin of the treatment subject by electricity from the power supply.

Claim 12

The electric skin beauty device of claim 9, wherein at the ends of the plurality of metallic needles, any one of the followings, i.e., ion, radio wave, ultrasound, high frequency, medium frequency, and low frequency, is generated by the power supply.

Claim 13

A skin beauty device comprising:

a plurality of pins protruding from the inner surface of the device, at least one of which is capable of penetrating tissue on or near the skin tissue to be treated; and

a signal generator electrically connected to the one or more pins, and which, when energized, causes the one or more pins to vibrate.

Claim 14

The skin beauty device of claim 13, wherein a drug is disposed on at least a portion of the interior surface of the device.

Claim 15

The skin beauty device of claim 14, wherein the drug is a photoactive drug.

Claim 16

The skin beauty device of claim 13, wherein the device has one or more LEDs embedded therein.

Claim 17

The skin beauty device of claim 16, further comprising an LED power application module, wherein the LED power application module generates an infrared signal toward the skin tissue to be treated upon power application.

Claim 18

The skin beauty device of claim 13, wherein the signal generator is electrically connected to the one or more pins, and wherein applying power to the signal generator causes the one or more pins to vibrate for a predetermined time cycle.

Claim 19

The skin beauty device of claim 13, wherein the signal generator vibrates the one or more pins with a first signal upon power application and vibrates one or more other pins with a second signal.

Specification

Technical Field

[0001] Cross-referencing of related patent applications

[0002] This application claims the benefit of priority to Korean Patent Application No. KR10-2008-0076993, filed August 8, 2008, entitled "ELECTRIC SYSTEM, SKIN, SKIN PROTECTION AND BEAUTY APPARATUS," which is incorporated herein by reference in its entirety.

[0003] Various embodiments described herein are related to the cosmetic treatment of skin tissue, including a system and a method for use in the cosmetic treatment of skin tissue.

Background Art

[0004] The present invention provides such procedures that may be desirable for the cosmetic treatment of skin tissue.

Description of the Invention

The Task to Accomplish

[0005] It is an object of the present invention to provide a skin beauty device, a beauty system, and a beauty method.

Means to Accomplish the Task

[0006] To accomplish the object above, a method of skin beauty of the present invention includes: providing an device having a plurality of pins protruding from an interior surface of the device; positioning the device on or near the skin tissue to be treated with a force sufficient to cause the one or more pins to penetrate the skin; and applying power to a signal generator electrically connected to the one or more pins to vibrate the one or more pins.

Effects of the Invention

[0007] According to the present invention, by applying ionic stimulation and electric vibration stimulation of a predetermined frequency in the skin layer, it is possible to hugely increase the absorption rate of solution, cream, gel, ointment, etc., in the skin layer, thereby enabling effective regeneration of skin tissue.

Brief Description of the Drawings

[0008] FIG. 1a is a simple perspective view of a skin beauty device according to various embodiments.

FIG. 1b is a simple side view of a skin beauty device, according to various embodiments.

FIG. 1c is a simple exploded perspective view of a skin beauty device layer, according to various embodiments.

FIG. 1d is a simple hypothetical view of a skin beauty device, according to various embodiments.

FIG. 2a is a simple perspective view of a skin care system, according to various embodiments.

FIG. 2b is a simple cross-sectional view of a skin beauty device, according to various embodiments.

FIG. 2c is a simple cross-sectional view of another skin beauty device, according to various embodiments.

FIG. 2d is a simple cross-sectional view of another skin beauty device, according to various embodiments.

FIG. 2e is a simple hypothetical view of a skin beauty device, according to various embodiments.

FIG. 2f is a simple exploded perspective view of a skin beauty device layer, according to various embodiments.

FIG. 3a is a simple perspective view of another skin beauty device according to various embodiments.

FIG. 3b is a simple perspective view of another skin beauty device according to various embodiments.

FIG. 4a is a simple block diagram of different skin beauty device layers, according to various embodiments.

FIG. 4b is a simple block diagram of a beauty device and layers of another skin care system, according to various embodiments.

FIG. 4c is a simple block diagram of a beauty device and layer of another skin care system, according to various embodiments.

FIGS. 5a through 6 are signal graphs applicable to one or more skin care systems, in accordance with various embodiments.

FIGS. 7a through 7c are flow diagrams illustrating a treatment algorithm of a skin aesthetic system, according to various embodiments.

FIG. 8 is a block diagram of components according to various embodiments.

Specific Description for Practicing the Invention

- [0009] FIG. 1a is a simple perspective view and FIG. 1b is a simple side view of a skin beauty device 10, according to various embodiments. The skin beauty device 10 may comprise a user handle 220 coupled to an acupuncture plate 200. In one embodiment, the acupuncture plate 200 may be elastically coupled to the handle member 222 via an elastic member 210. The elastic member 210 may be constructed of a combination of elastic and non-elastic materials. The elastic material may include plastic, rubber (synthetic or natural), and springs.
- [0010] FIG. 1c is a simple exploded perspective view illustrating an embodiment of an acupuncture plate 200, according to various embodiments. The acupuncture plate 200 may comprise a substantially rigid top surface member or layer 290, a transformable or elastic resilient member or layer 270, and an acupuncture member or layer 250. The acupuncture member 250 may comprise a plurality of acupuncture pins or needles 230. FIG. 1d is a simple bottom view of acupuncture plate 200 showing holes or arrangements for acupuncture pins or needles 230. In one embodiment, the acupuncture plate 200 may have a square cross-section with dimensions of about 1 to 4 centimeters wide and about 1 to 6 centimeters long. The acupuncture plate 200 may have any shape, including circular, oval, or polygonal, and the shape may be specific to the area of skin to be treated.
- [0011] In one embodiment, the acupuncture plate may comprise about 140 uniformly spaced pins or needles 230. Each needle may have a diameter of about 0.1 to 0.4 millimeters and a length of 0.2 to 1.4 mm, with one embodiment having a diameter of 0.3 millimeters and a length of 0.8 mm. The elastic member or layer 270 may comprise a combination of elastic or non-elastic materials. The elastic material may include plastic, rubber (synthetic or natural), and springs. The acupuncture member 250 may be directly or indirectly coupled to the top surface member 290 by interposing the elastic member 270 via adhesive, screws, welding, or other connection means. In one embodiment, the acupuncture member 250 may comprise an elastomer to allow for at least partial transformation of the acupuncture member 250 relative to the acupuncture pin 230.
- [0012] In a procedure, a user may utilize the skin beauty device 10 to create micro-wounds or micro-holes in the dermalogical [sic] layers of the skin or dermis of a patient 20. The micro-wounds or micro-holes may be used to enhance the absorption or application of one or more drugs applied over or around the micro-wounds or holes.
- [0013] FIG. 2a is a simple illustration of a skin beauty system 310, according to various embodiments. The system 310 includes a skin beauty device 320 electric signal generation system 300. The electric signal generation system 300 may be electrically connected to the skin beauty device 320 via one or more wires 300A and to the patient 20 via one or more wires 300B. FIG. 2b is a cross-sectional view of the skin beauty device 320, according to various embodiments. The skin beauty device 320 may include a handle 330, an elastic member 333, an electric input member 340, internal wires 331, and an acupuncture plate 350. The acupuncture pins 351 may have any length "A" (0.3 millimeters to 2.1 millimeters in one embodiment), and one or more of the acupuncture pins 351 are electrically connected to the electric input member 340 via the internal wires 331. Electric input member 340 may be detachably connected to signal generation system 300 via wire 300A.

- [0014] Electric signal generation system 300 may generate various signals (as shown in FIGS. 5a through 6) to vibrate one or more acupuncture pins 351 electrically connected to system 300 via internal wire 331 and wire 300A. The vibration of the pins 351 may increase the micro-injuries or incisions formed in the skin by the pins 351. FIG. 2c is a simple cross-sectional view of a skin beauty device 360, according to various embodiments. The device 360 may include a handle 330, an elastic member 333, a conductive grounding member 390, internal wires 331, a signal generator 370, a switch 375, and an acupuncture plate 350. Signal generator 370 may be connected to one or more pins 351 via internal wire 331 and may also be connected to conductive ground 390.
- [0015] On another note, at the ends of the one or more pins 351, any one of the followings, i.e., ion, radio wave, ultrasound, high frequency, medium frequency, and low frequency, is generated by the electric signal generation system 300 or signal generator 370. Explaining the effect of ions at the ends of one or more pins 351, it may be the that ions utilize electro-repulsion due to their polarity, and low frequencies using direct current, which are particularly effective for active ingredients that are to be penetrated through one or more pins 351 by ions. For example, vitamin C is produced in powder form because it is soluble in water and quickly denatured, and in this case, it is possible to increase the penetration into the cell by dissolving it in water and applying it directly to the skin and penetrating it through at least one pin 351.
- [0016] On another note, the effect of the radio waves generated at the ends of one or more of the pins 351 will now be described. Given that high frequencies such as radio waves are basically alternating current, if one or more of the pins 351 is made of stainless steel, an electromagnetic field will be formed around the electrodes, which will cause thermal coagulation, which is a basic principle of radiofrequency surgical devices. If the electrodes are closely spaced, the surrounding area may be completely solidified.
- [0017] On another note, the effect of ultrasonic waves being generated at the ends of one or more of the pins 351 will now be described. The ultrasonic waves, depending on the degree of tuning of the one or more of the pins 351, will have a peak that may cover the weaknesses of high frequencies because it will be able to transmit vibrational energy accompanied by thermal energy to the ends of the pins 351. More importantly, the cavitation effect may be utilized as a way to physically break the cell membrane of the targeted cell.
- [0018] The signal generator or module 370 may generate various signals (as shown in FIGS. 5a through 6) to vibrate one or more pins 351 electrically connected to the electric signal generation system 300 via the internal wires 331 and the conductive grounding member 390. In a procedure, the user 20 may grasp the conductive grounding member 390 and place the electrically connected one or more pins 351 in contact with the patient's skin, forming an electric path from the pins 351 to the conductive grounding member 390. The signal generator 370 may comprise a battery to provide power to generate one or more electric signals. A switch 375 connected to the signal generator 370 may cause the signal generator 370 to generate the one or more electric signals for a predetermined time cycle or until the switch 375 is turned off again. As described above, the vibration of the pin 351 may increase the micro-injuries or incisions formed in the skin by the pin 351.
- [0019] FIG. 2d is a simple cross-sectional view of a skin beauty device 362, according to various embodiments. The beauty device 362 may include a handle 330, an elastic member 333, internal wires 331, 332, a signal generator 370, a switch 375, and an acupuncture plate 350. Signal generator 370 may be connected to one or more pins 351 via internal wire 331 and to one or more other pins 352 via internal wire 332. In operation, the pins 351, 352 may form one or more dipole pairs (bipole pairs). The signal generator or module 370 may generate various signals (such as those shown in FIGS. 5a through 6) to cause the one or more dipole pairs or bipolar pins 351, 352 to vibrate.
- [0020] FIG. 2f is a simple exploded perspective view of an acupuncture plate 350 having one or more electrically connected pins 351, according to various embodiments. The acupuncture plate 351 may comprise a substantially rigid top surface or layer 357, a transformable or resilient elastic member or layer 355, and an acupuncture member or layer 353. The acupuncture member 353 may comprise a plurality of acupuncture pins or needles 351, wherein one or more of the pins 351 are electrically connected to the wires 331. In a bipolar configuration, a second wire 332 may be connected to one or more other pins 351. FIG. 2e is a simple bottom view of an acupuncture plate 350 showing acupuncture pins or needles 359, 357, wherein a pin may be electrically connected to a first wire 331 and a second wire 332 to form a dipole pair (bipolar pins).
- [0021] In one embodiment, the acupuncture plate 350 may have a square cross-section with dimensions of about 1 to 4 centimeters wide and about 1 to 6 centimeters long. The acupuncture plate 350 may have any shape, including circular, oval, or polygonal, and the shape may be specific to the area of skin to be treated.
- [0022] In one embodiment, the acupuncture plate may comprise about 140 uniformly spaced pins or needles 351. Each needle may have a diameter of about 0.1 to 0.4 millimeters and a length of 0.2 to 1.4 millimeters, with one embodiment having a diameter of 0.3 millimeters and a length of 0.8 millimeters. The elastic member or layer 355 may be constructed of an elastic material or a combination of elastic and non-elastic materials. The elastic material may include plastic, rubber (synthetic or natural), and springs. The acupuncture member 353 may be directly or indirectly coupled to the top surface member 357 by interposing the elastic member 355 via adhesive, screws, welding, or other connection. In one embodiment, the acupuncture member 353 may comprise an elastomer to enable at least partial transformation of the acupuncture member 353 relative to the acupuncture pin 351.

- [0023] FIGS. 3A and 3B are simple perspective views of skin beauty devices 400, 460 having one or more pins 451 that may be connected to an electric signal generator via internal wires 458. Each beauty device 400, 460 includes a round roller 450 having a plurality of acupuncture pins 451, which may be similar to acupuncture pins 351. In the beauty device 400, the electric lead wire 300A may be connected to an electric input member 410 within the beauty device handle 430, which is electrically connected to the internal wires 458. In the hair dryer 460, the handle 430 may comprise a signal generator 470 similar to the signal generator 370, a switch 475, and a conductive surface 490. Except for the ability of the rollers 460, 400 to rotate, the rollers 460 may operate similarly to the rollers 360 during a treatment. In one embodiment, the rollers 450 may have various shapes to suit the area of skin to be treated.
- [0024] In any of the above-described beauty devices 10, 320, 360, 362, 400, 460, the acupuncture plate or roller 200, 350, 450 may comprise a plurality of embedded LEDs 32A, 32B, a battery 52, a controller 54, and an antenna 56, as shown in Figure 4a. In one embodiment, LED 32A may be configured to emit energy in a first specific frequency range, and LED 32B may be configured to emit energy in a second specific frequency range. The surface 22 of the roller 450, and acupuncture plate 200, 350 may include a drug 22A that may be used to treat skin cells. The drug 22A may be responsive in the first and second wavelength ranges. Further, the skin cells may be responsive in the first and second wavelength ranges. And, the combination of the drug 22A, and the application of the first and second wavelength ranges to the drug 22A and the skin cells may have a synergistic effect.
- [0025] In one embodiment, the drug 22A may be applied directly to the skin to be treated. In other embodiments, the drug 22A may not be further utilized by the beauty device 10, 320, 360, 362, 400, 460. In one embodiment, the acupuncture members 250, 353 may be translucent, and may also be polyurethane, medical grade silicone, or other flexible translucent hypoallergenic material.
- [0026] In one embodiment, a local controller 54 and battery 52 may be embedded in the top surface member 290, 357, acupuncture member 250, 353, or handle 220, 330, or separately between these members. The controller 54 may be electrically connected to the one or more LEDs 32A. The controller 54 may also be connected to the battery 52. The controller 54 may generate one or more signals for the LEDs 32A, 32B depending on the user switches 75, 76. These signals may vary over a first and second frequency range. The controller 54 may comprise one or more timers 58 that may limit the energy supply to the LEDs 32A, 32B to a predetermined time cycle. In one embodiment, the controller may be connected to an antenna 56 to receive and transmit one or more signals associated with the transmission of energy to the one or more LEDs 32A, 32B. In one embodiment, the beauty device 10 may be configured to treat specific areas of skin cells, such as on the face. The device 10 may be configured to conform to the user's anatomy so that the radiated light may be focused on the skin cells. In other embodiments, the beauty device 200 may be configured to treat other body parts, including skin cells on the arms, legs, chest, hands, feet, neck, or other areas.
- [0027] In the embodiment 510 shown in FIG. 4b, the controller 54, antenna 104, and power source 60 may be disposed on the exterior of the hairdresser 10, 320, 360. The power source 60 may be connected to the controller 54. The controller 54 may be connected to the one or more LEDs 32A, 32B via one or more wires 106. The controller 54 may generate one or more signals for the LEDs 32A, 32B depending on the user switch 56. The signals may vary between first and second frequency ranges. The controller 54 may comprise one or more timers 58 that may limit the energy supply to the LEDs 32A, 32B to a predetermined time cycle. In one embodiment, the controller may be connected to the antenna 104 to receive and transmit one or more signals associated with the transmission of energy to the one or more LEDs 32A, 32B.
- [0028] In any of the above-described beauty devices 10, 320, 360, 362, 400, 460, the acupuncture plates 200, 350 or rollers 450 may comprise a plurality of embedded LED lenses 536, fiber optic paths 534, and LEDs 532. In this embodiment, the LEDs 532 may be connected to the lens 536 via the fiber optic path 534.
- [0029] FIGS. 5a and 5B are drawings illustrating electric signal waveforms 650, 630, 640, which may be applied to one or more LEDs 32A, 32B, 532 and pins 230, 351, 451 according to various embodiments. The signal waveform 650 may comprise a plurality of square-wave pulses 652, 654, 656, which may be applied to the LEDs 32A, 32B, 532. Each pulse 652, 654, 656 has a similar size and envelope. The waveform 650 may be used to periodically P1 apply power to the LEDs 32A, 32B, 532 and pins 230, 351, 451 for a predetermined interval T1, with each pulse 652, 654, 656 having an amplitude A1. In one embodiment, the amplitude A1 may be from about 0.1 milliamperes (mA) to 10 mA, the pulse width T1 may be from about 100 to 500 microseconds (μ s), and the period P1 may be from 100 ms to 500 ms, depending on the energy required to create a capacitance in the liquid. In other embodiments, depending on the energy to drive the LED or to vibrate the one or more pins 230, 351, 451, the amplitude A1 may be about 0.5 to 5 milliamperes (mA), the pulse width T1 may be about 200 microseconds (μ s), and the periodic cycle P1 may be 250 ms.

- [0030] In FIG. 5b, a signal waveform 630 may be applied to a first LED module or group 32A, 32B, 532 and pins 230, 351, 451, and a second waveform 640 may be applied or used to power a second LED module 32A, 32B, 532 and pins 230, 351, 451, 352. The signal waveform 630 includes a plurality of square wave pulses 632, 634, 636, and the signal waveform 640 includes a plurality of square wave pulses 642, 644, 646. Each pulse 632, 634, 636, 642, 644, 646 has a similar size and envelope. The waveform 630 may be used to apply power to the first LED 32A, 32B, 532 and pins 230, 351, 451 periodically (P1) for a predetermined interval (T1), with each pulse 632, 634, 636 having an amplitude A1. The waveform 640 may be used to apply power to the second LED module 32A, 32B, 532 and pins 230, 351, 451 periodically (P2) for a predetermined interval (T2), with each pulse 642, 644, 646 having an amplitude (B1). Depending on the energy affecting the skin cells or drug 22A, the pulse widths T1, T2 may be from about 100 to 500 microseconds (μ s), and the periodic cycles P1, P2 may be from 100 ms to 500 ms. In other embodiments, depending on the energy affecting the skin cells or drug 22A, the amplitude A1, A2 may be about 0.5 milliamps (mA) to 5 mA, the pulse width T1, T2 may be about 200 microseconds (μ s), and the period P1, P2 may be about 250 ms. In other embodiments, pulses 632, 634, 636 do not substantially overlap with pulses 642, 644, 646. In other embodiments, $T1 > T2$, and P2 is an integer multiple of P1.
- [0031] FIG. 6 depicts a waveform including a plurality of pulses 672, 674, 676, 678, 682, 684. These pulses may not overlap in the time or frequency domain. In one embodiment, each pulse 672, 674, 676, 678, 682, 684 may have a pulse width T3, a frequency spectrum width F1, and a period P3. Pulse 672 is a frequency offset from pulse 674, pulse 676 is a frequency offset from pulse 678, and pulse 682 is a frequency offset from pulse 684. Pulses 672, 674, 676, 678, 682, 684 may be applied to the LED module to affect skin cells or drug 22A and pins 230, 351, 451. Pulses 672, 674 with different frequency spectra may be applied to different LEDs to stimulate them. In one embodiment, pulses 672, 676, 682 may be applied to a first LED module and pulses 674, 678, 684 may be applied to a second LED module. The frequency separation between each pulse may result in simultaneous energy supply to the first and second LED modules and pins 230, 351, 451 and subsequent independent spectra.
- [0032] In one embodiment, the present invention may utilize the algorithm 740 illustrated in FIG. 7a to perform a treatment on skin cells. A user, clinician, or equipment operator positions a beauty device 10, 320, 360, 362, 400, 460 over a skin cell to be treated while pressing the beauty device firmly against the cell so that one or more pins 230, 351, 451 are sufficiently inserted into the cell (activity step 741). A first signal as shown in FIGS. 5a, 5b, 6 may be applied to the pins 230, 351, 451 of the first LED module or group 32A and the skin beauty device 10, 320, 360, 362, 400, 460 for a predetermined time cycle (activity step 744). A second signal, as illustrated in FIGS. 5a, 5b, and 6, may be applied to the pins 230, 351, 451 of the second LED module or group 32B and the skin beauty device 10, 320, 360, 362, 400, 460 for a predetermined time cycle (activity step 748). This signal applied to the group may be selected to stimulate the skin cells or drug 22A and/or cause vibration to one or more of the pins 230, 351, 451.
- [0033] In another embodiment, the present invention may utilize the algorithm 750 illustrated in FIG. 7b for treating skin cells. A user, clinician, or equipment operator applies a light-sensitive chemical onto the beauty device 10, 320, 360, 362, 400, 460 or onto the skin cells to be treated (activity step 751). The user, clinician, or equipment operator positions the skin beauty device (10, 320, 360, 362, 400, 460) over the skin cells to be treated (activity step 752). A signal, as illustrated in FIGS. 5a, 5b, and 6, may be applied to the LED module or group 32A or 32B and pins 230, 351, 451 for a predetermined time cycle (activity step 756).
- [0034] In another embodiment, the present invention may utilize the algorithm 760 illustrated in FIG. 7c for treating skin cells. A user, clinician, or equipment operator applies a photosensitizing agent onto the beauty device 10, 320, 360, 362, 400, 460 or onto the skin cells to be treated (activity step 761). The user, clinician, or equipment operator positions the beauty device 10, 320, 360, 362, 400, 460 over the skin cells to be treated (activity step 762). A first signal, as illustrated in FIGS. 5a, 5b, and 6, may be applied to the pins 230, 351, 451 of the first LED module or group 32A and the skin beauty device 10, 320, 360, 362, 400, 460 for a predetermined time cycle (activity step 764). A second signal as shown in FIGS. 5a, 5b, and 6 may be applied to the pins 230, 351, 451 of the second LED module or group 32B and the skin beauty device 10, 320, 360, 362, 400, 460 for a predetermined time cycle (activity step 768).

- [0035] The skin beauty devices 10, 320, 360, 362, 400, 460 may be used to utilize cosmetic, drug, or other medications directly on skin cells, such as skin, with the addition of specific frequency light for treatment and healing of epithelial cells of the skin or tissues beneath the skin, to help the used substance to be delivered, absorbed, and function more effectively. The LEDs 32A, 32B generate light of a specific frequency. The application of light allows the skin beauty devices 10, 320, 360, 362, 400, 460 to retain cosmetics, drugs, or other medications on skin cells for a longer period of time while preventing dehydration of the applied substance. The application of such light may enhance the efficacy of the cosmetic, drug, or other medications, depending on the wavelength or frequency selected.
- [0036] Additionally, the application of the skin beauty system may increase cellular activity, help tissues heal more quickly, and facilitate the delivery, absorption, and consumption of the used cosmetic, drug, or medications 23A within the cell. LED light at certain frequencies may increase fibroblast production and collagen, as well as other cellular activities, including stimulating organelles and mitochondria to promote the production of ATP for cellular energy, for improved function, reduced procedure time, and accelerated healing. The substances applied to the body by the skin beauty devices 10, 320, 360, 362, 400, 460 become more potent and useful to the body at the cellular level.
- [0037] The skin beauty devices 10, 320, 360, 362, 400, 460 may promote basic energy processes within the mitochondria (energy compartments) of each cell, particularly when near-infrared light is used to activate internal photosensitizers (chromophores, cytochromes). However, these spectra are not limited to UV, and other visible and IR spectra may also be utilized. In one embodiment, optimal light LED wavelengths for skin grooming may include wavelengths of 640, 680, 730 nanometers (nm) relative to IR 880 nanometers. In addition, the application of blue light of 400 to 490 nanometers through the skin beauty devices 10, 320, 360, 362, 400, 460 may inhibit the growth of bacteria or fungi inside and outside of skin cells and kill them. In conjunction with the use of LEDs or other active light sources to increase their effectiveness on the cells and tissues of the body, the skin beauty devices 10, 320, 360, 362, 400, 460 may be utilized to apply cosmetics, drugs, or other active agents directly to the skin and maintain them for extended periods of time. The skin beauty devices 10, 320, 360, 362, 400, 460 is highly portable and may be carried by a user during a procedure.
- [0038] Drug 22A may be alpha hydroxy acids (AHA's), natural oils, aloe vera blends, collagen promoters, bt, chitosan, daeses, endorphins, photodynamic drugs (PDT) such as (photofrin or ALA), vitamins A, C, E or others, kojic acid, retinol or other exfoliants, salicylic acid, antioxidants or other blood flow promoters (youth boosters) and anti-aging cosmetics or drugs, disinfectants, antibiotics, anticancer drugs, and cosmetics, drugs and other active preparations comprising aromatic remedies, fruit and vegetable extracts, anti-inflammatory agents, analgesics, hormones, depilatory agents and the like. However, the present invention is not limited to these and may include any drug, herbal formulation, or active mixture useful for skin or other tissue.
- [0039] FIG. 8 is a block diagram of a beauty system 780, according to various embodiments. The system 780 illustrated in FIG. 8 may be used as a skin beauty device 10, 320, 360, 362, 400, 460 in various embodiments. The system 780 may be a computer device, including a personal data assistant (PDA), a cell phone, a laptop computer, or a desktop computer. The system 780 may include a central processing unit (CPU) 782, random access memory (RAM) 784, read-only memory (ROM) 806, display 788, user input device 812, transceiver application specific integrated circuit (ASIC) 816, digital-to-analog (D/A) and analog-to-digital (A/D) converters 815, microphone 808, speaker 802, and antenna 804. CPU 782 may have an OS module 814 and an application module 813. RAM 784 may have a switch and timer 58.
- [0040] The ROM 806 is connected to the CPU 782 and may store program instructions to be executed by the CPU 782. RAM 784 is connected to CPU 782 and may store temporary program data, overhead information, and queues 798. User input device 812 may include a keyboard, touch pad screen, track ball, or other similar input device that the user may manipulate through menus to operate system 780. Display 788 may be a CRT, LCD, LED, or other light emitting device that allows a user to read, see, or hear a user detectable signal.
- [0041] Microphone 808 and speaker 802 may be included within system 780. Additionally, the microphone 808 and speaker 802 may be separate from the system 780. Incoming data may be passed to CPU 782 via a bus 796, where the data may include signals for LEDs 32A, 32B, 332 or optical modules or wires 331, 458. The transceiver ASIC 816 may include a set of instructions necessary to communicate the data, screen, or signal. The transceiver ASIC 816 may be connected to the antenna 804 to communicate wireless messages, pages, and signal information within the signal. When the transceiver ASIC 816 receives a message, the corresponding data may be passed to the CPU 782 via the serial bus 796. The data may include wireless protocols, overhead information, and data to be processed by system 780 according to methods described in this patent application.

- [0042] The D/A and A/D converter 815 may be connected to one or more optical modules to generate signals that may be used to power the one or more optical modules. The D/A and A/D converter 815 may be connected to one or more devices, such as LEDs 32A, 32B and pins 230, 351, 451. Any of the above-described components may be implemented in a number of ways, including embodiments of software. Thus, the LEDs 32A, 32B, pins 230, 351, 451, controller 54, switch 56, timer 58, and controller 320 may all be characterized as “modules” in this disclosure. And as appropriate for specific realizations of various embodiments, modules may comprise hardware circuits, single or a plurality of processor circuits, memory circuits, software program modules and objects, firmware, and combinations thereof.
- [0043] The beauty devices and systems of various embodiments may be useful in sales architecture configurations and other applications. However, as described in this patent application, they are not intended to function as a complete description of all elements and features of devices and systems that may enable the use of the structures in that regard.
- [0044] Various embodiments of novel dermatologic devices and systems may comprise multi-layer, multi-chip modules, including high-speed computers, communication and signal processing circuits, modems, single or a plurality of processor modules, single or a plurality of embedded processors, data switches, and electric circuits used by the system. Such skin beauty devices and systems may be further configured as subcomponents in various electric systems, such as televisions, cellular phones, personal computers (e.g., laptop computers, desktop computers, handheld computers, tablet computers, etc.), workstations, radios, video players, audio players (e.g., MP3 players), vehicles, medical devices (e.g., heart monitors, blood pressure monitors, etc.), and other devices. Some embodiments may include a plurality of methods.
- [0045] The activities described herein may be executed in other than the sequential order described herein. The various activities described for the methods identified in this disclosure may be executed in an iterative, serial, or parallel fashion.
- [0046] A software program may be loaded (launched) from a computer-readable medium within a computer-based system to execute functions prescribed by the software program. A variety of programming languages may be used to create a software program designed to implement and execute the methods described in this application. The program may be written in an object-oriented format using an object-oriented language such as Java or C++. Programs may also be written in a procedural-oriented format using a procedural language, such as Assembly or C. Software components may communicate using any number of mechanisms well known to those skilled in the art, such as application program interfaces or inter-process communication techniques, including remote procedure calls. Teaching of the various embodiments is not limited to any particular programming language or environment.
- [0047] The accompanying drawings, which form part of the present invention, are shown for illustrative purposes only and are not intended to limit the specific embodiments in which the treatment subject matter may be practiced. The embodiments shown are described in sufficient detail to enable one skilled in the art to practice the teachings disclosed herein. Other embodiments may be practiced and derived therefrom, and structural and logical substitutions and changes may be made without departing from the scope of the present disclosure. Therefore, This detailed description is not meant to be restrictive, and the scope of the various embodiments is governed solely by the appended claims, as is the entire scope of the equivalents to which such claims are appended.
- [0048] When one or more are actually disclosed, such embodiments having the subject matter of the present invention may be referred to in this application, individually or collectively, by the term “invention” for convenience. It is not intended that the scope of this application be voluntarily limited to any one invention or inventive concept. Accordingly, although specific embodiments are shown and described in this application, the specific embodiments shown may be substituted for any arrangement reasonably conceived to accomplish the same purpose. This disclosure is intended to cover any and all applications or variations of the various embodiments. Combinations of the above-described embodiments and other embodiments not specifically described in this application will become apparent to those skilled in the art upon review of the above description.
- [0049] An abstract of the technical content is provided pursuant to 37 C.F.R. § 1.72(b), which requires an abstract that allows the reader to quickly grasp the essence of the technical disclosure. It is to be understood that it is not intended to be used to interpret or limit the scope or meaning of the claims of the patent. In the detailed description above, various features are based together on a single embodiment for the purpose of simplifying the disclosure. The methods of the present disclosure should not be construed as requiring more features than specifically enumerated in each claim. Rather, the subject matter of the invention may be discovered less in all of the features of the single disclosed embodiment. Therefore, the following scope of patent claims is included in the detailed description, with each claim standing alone as a separate embodiment.

Drawings

FIG 1a

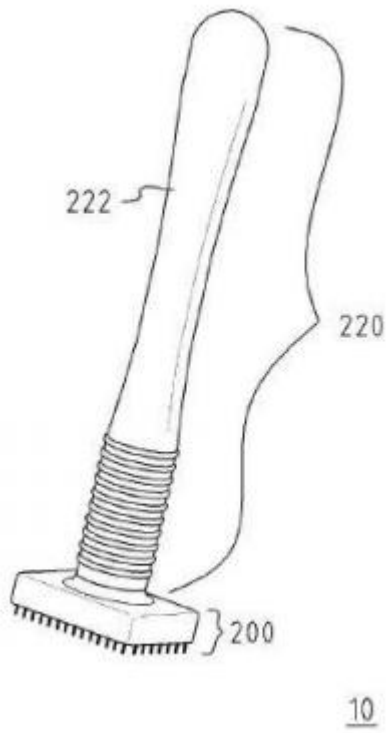


FIG 1b

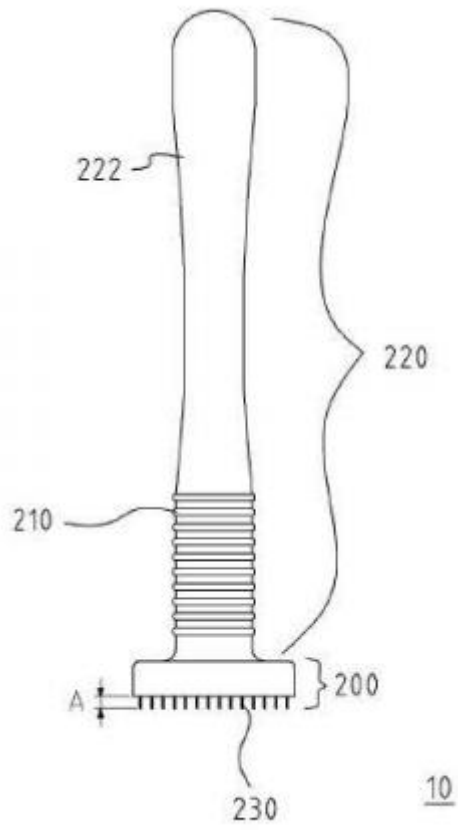


FIG 1c

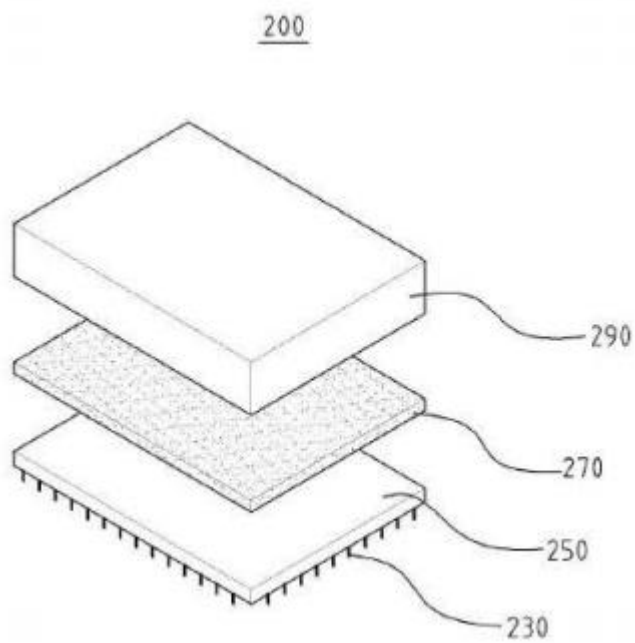


FIG 1d

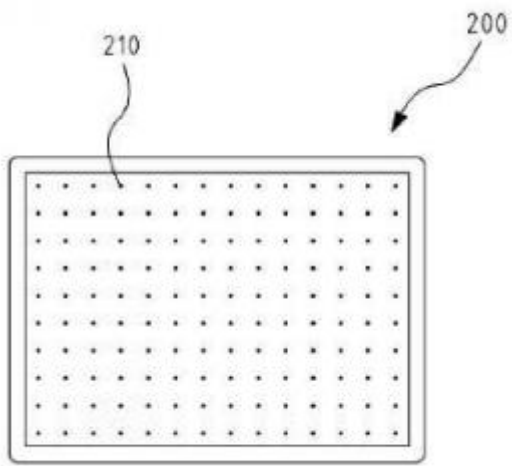


FIG 2a

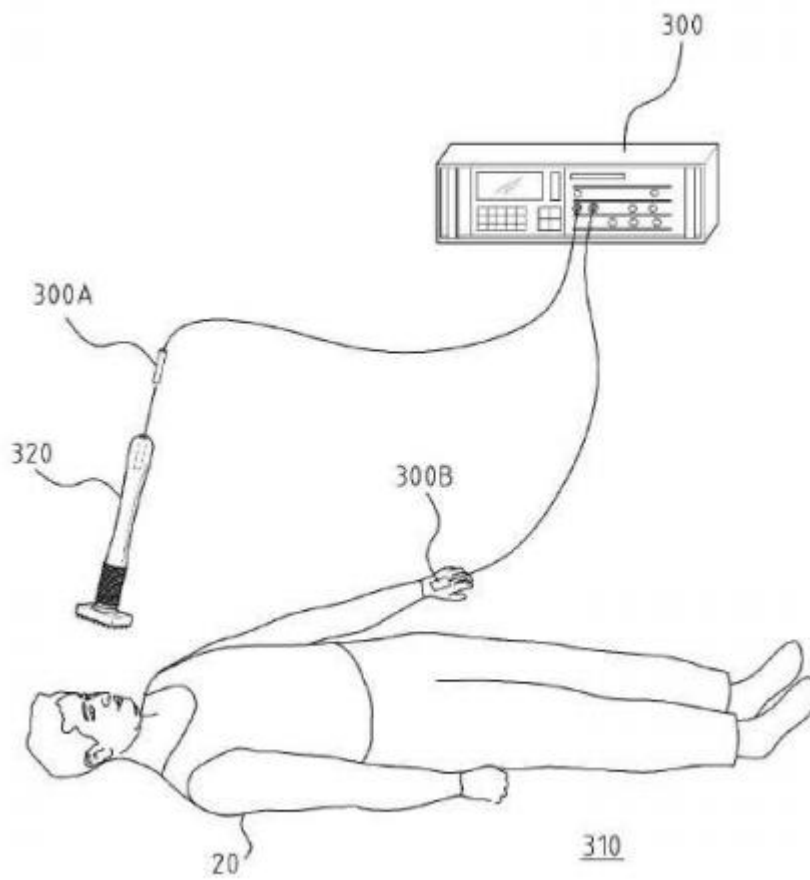


FIG 2b

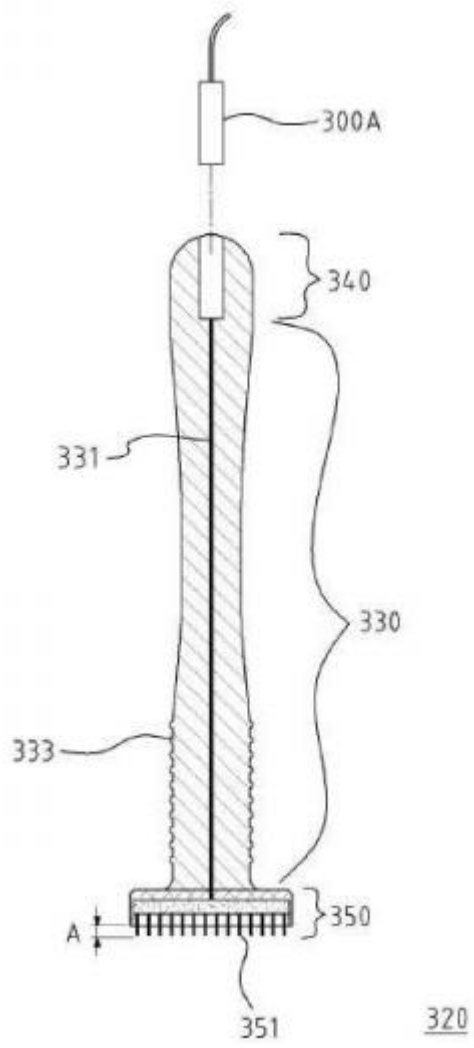


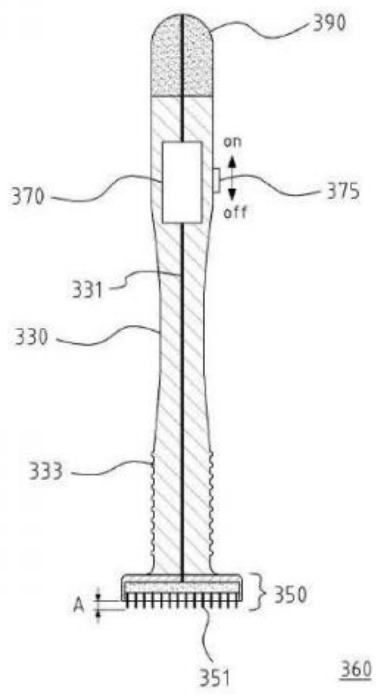
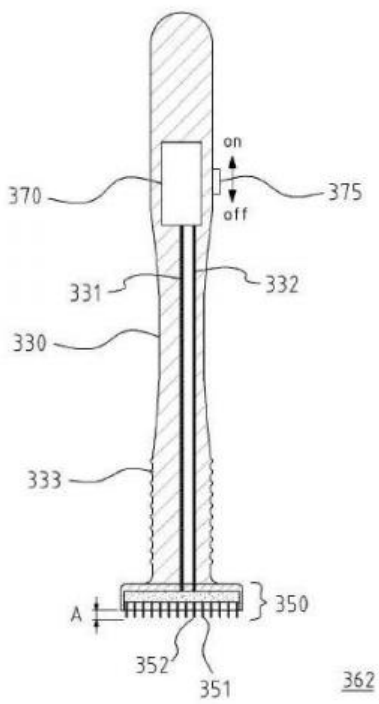
FIG 2c**FIG 2d**

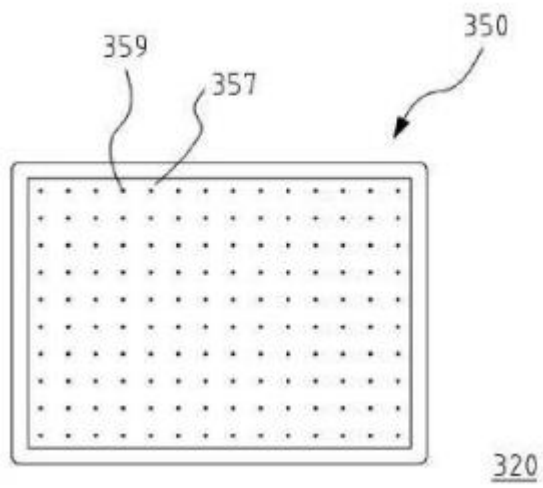
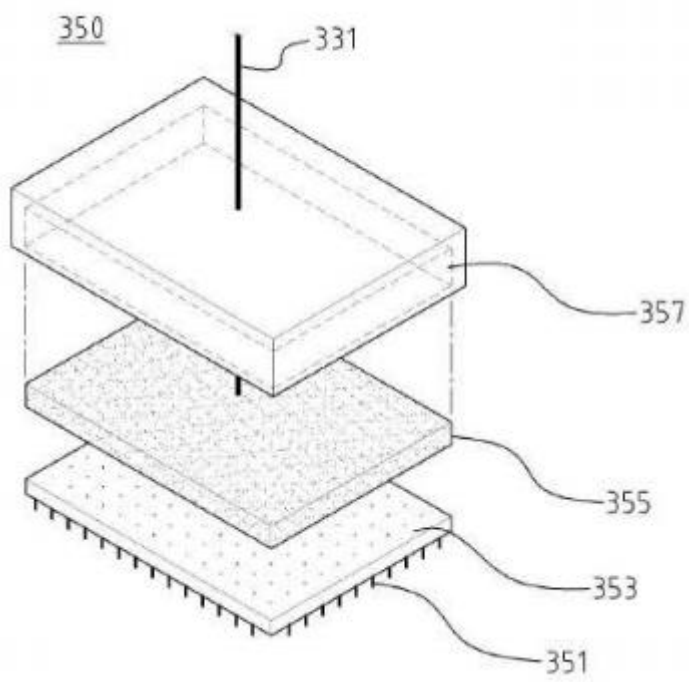
FIG 2e**FIG 2f**

FIG 3a

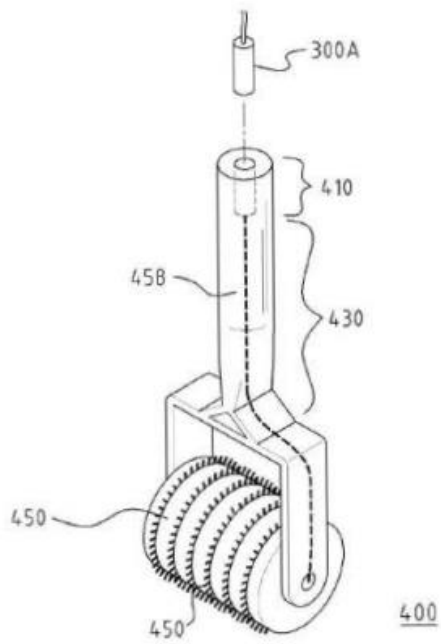


FIG 3b

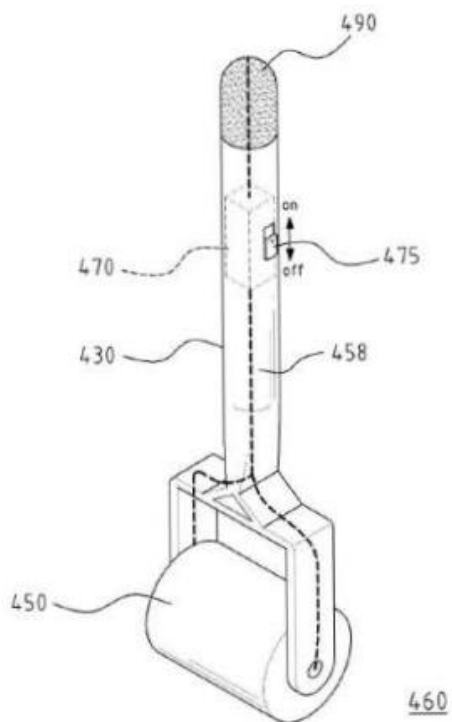


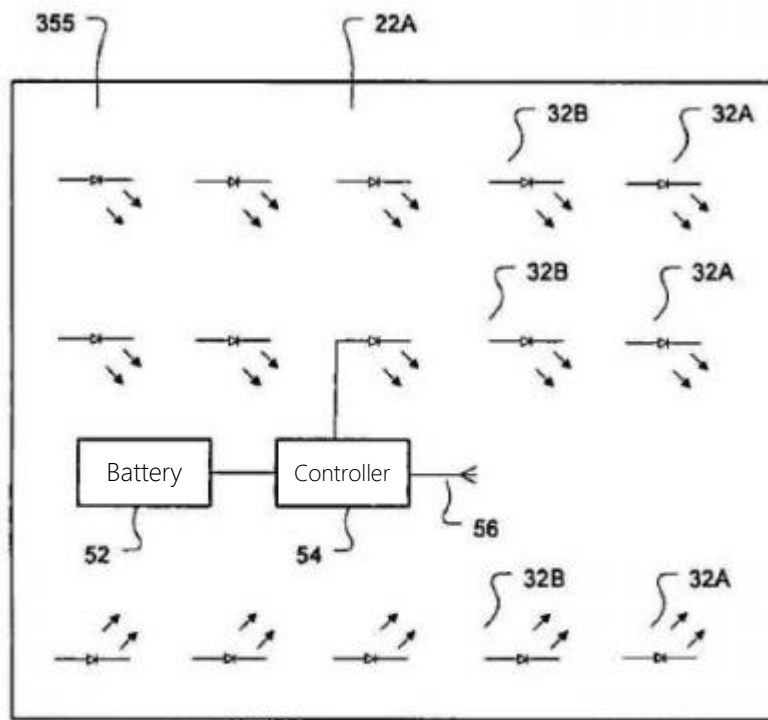
FIG 4a**520**

FIG 4b

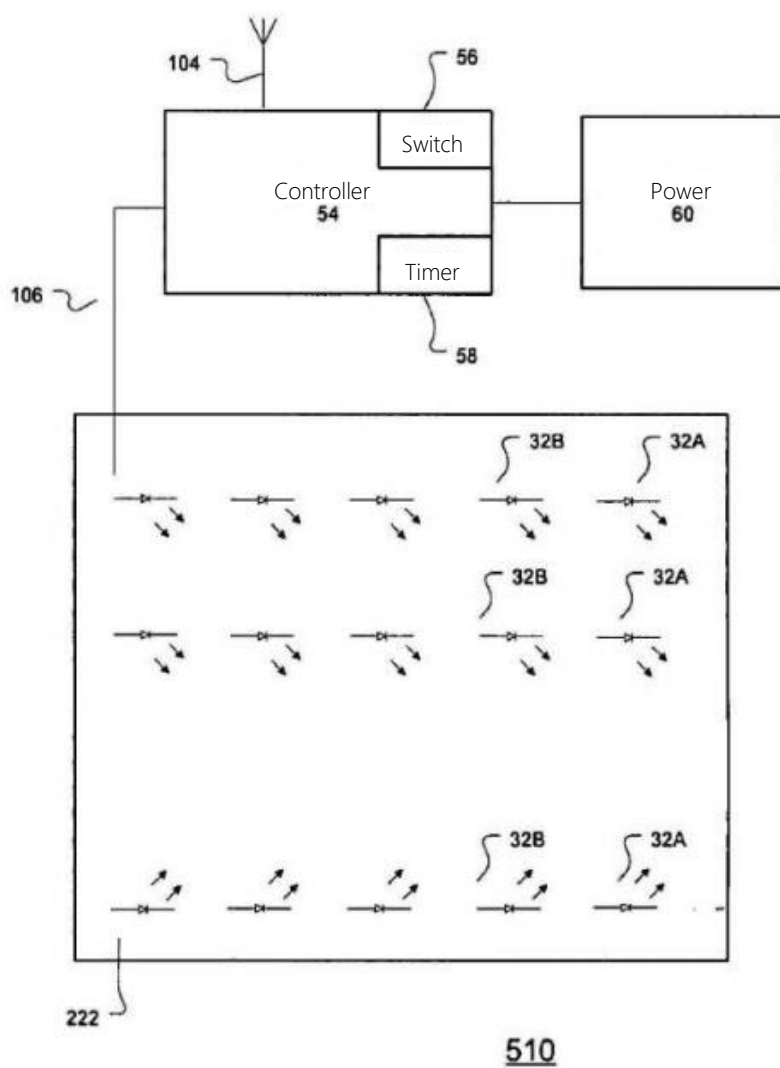


FIG 4c

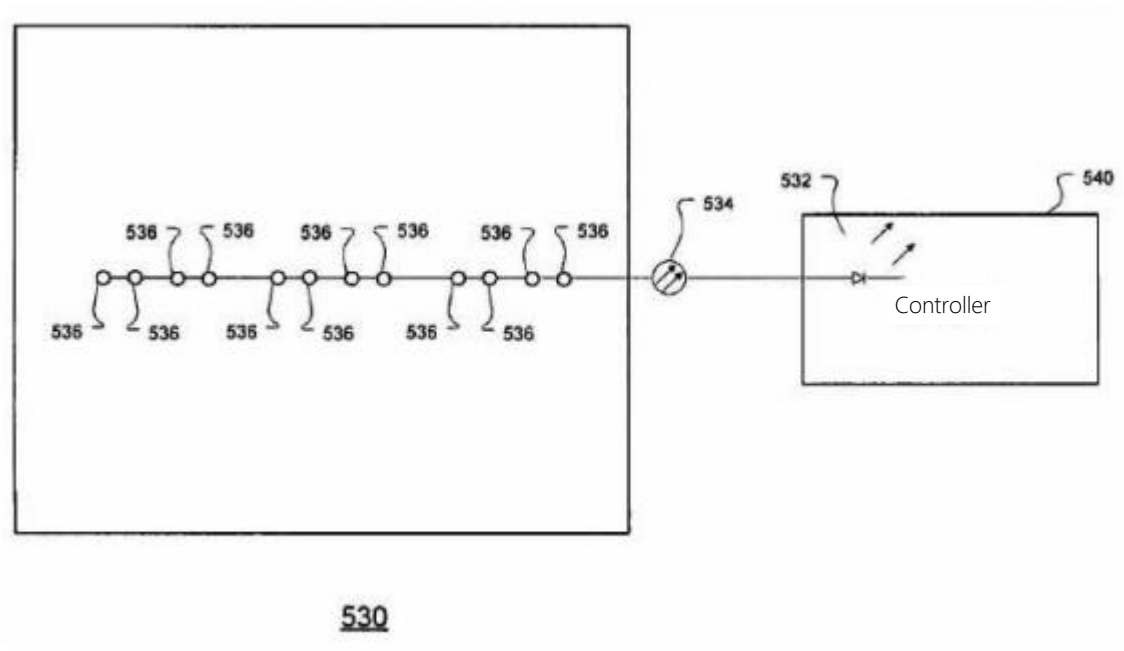


FIG 5a

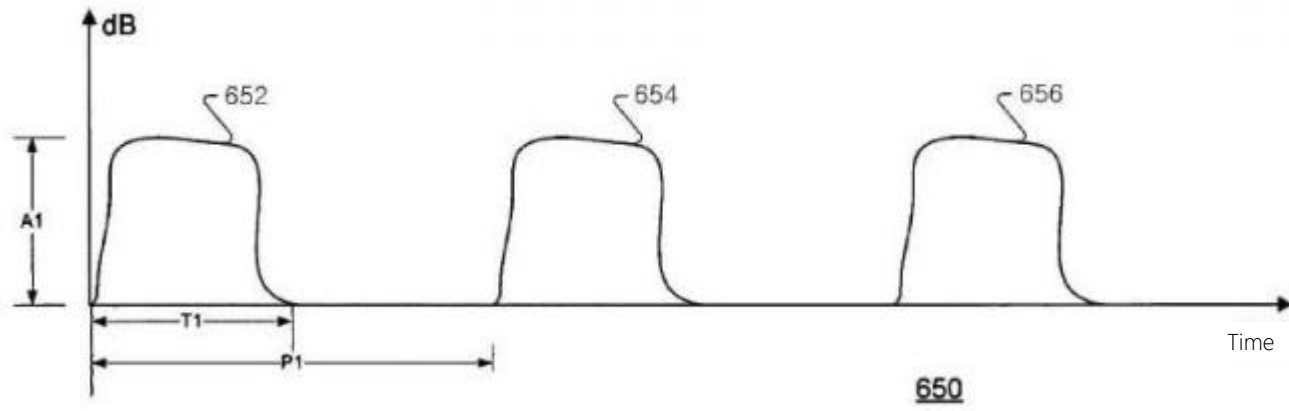


FIG 5b

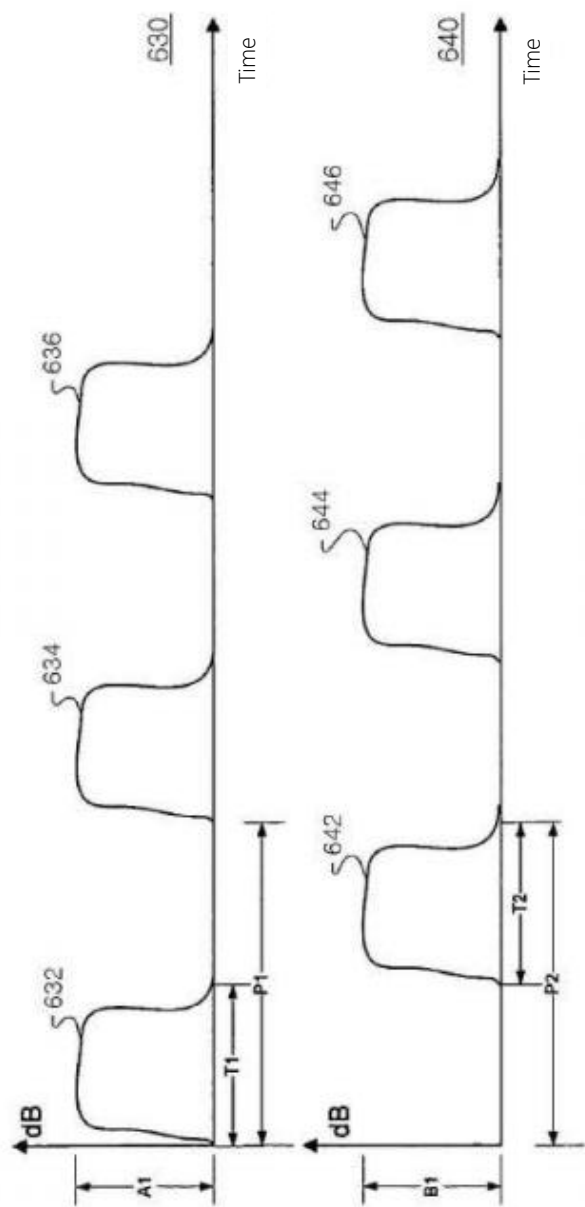


FIG 6

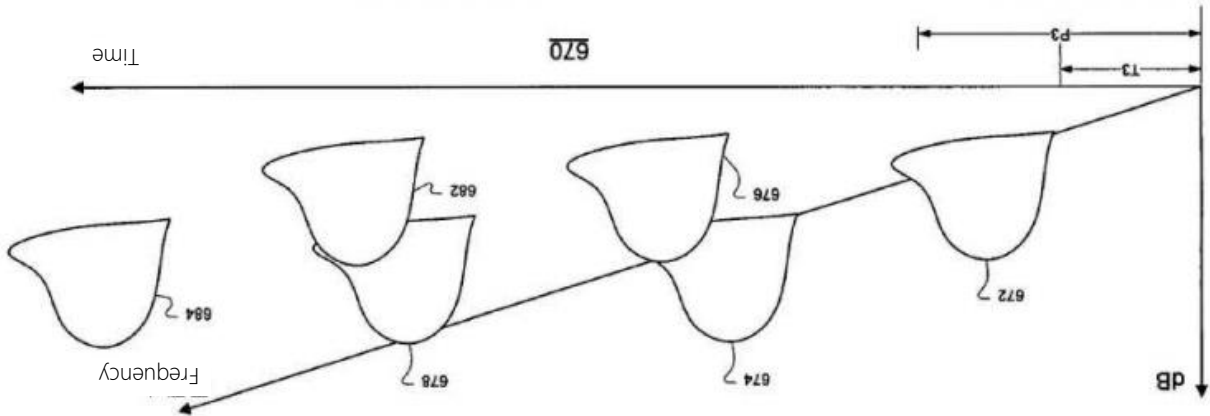


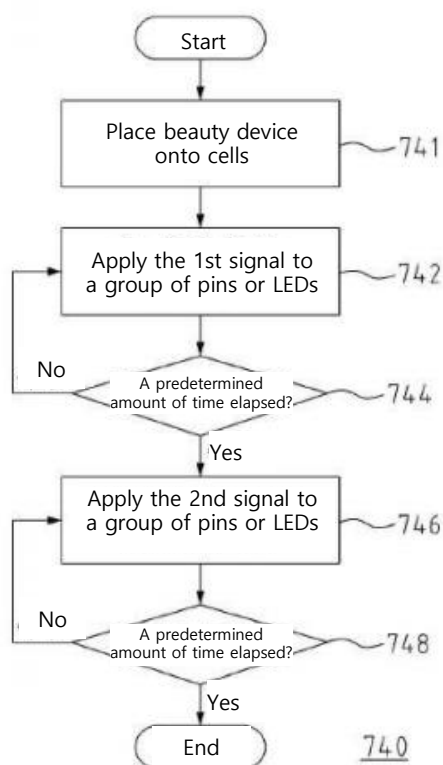
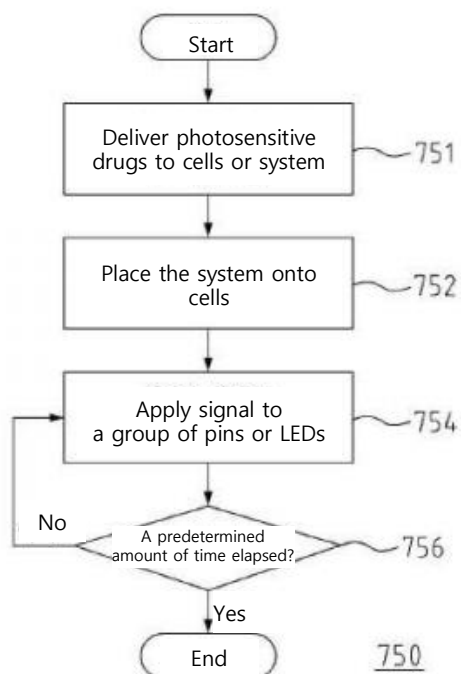
FIG 7a**FIG 7b**

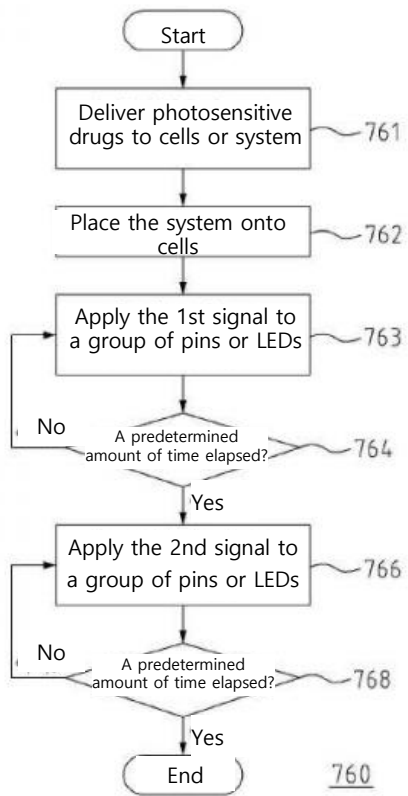
FIG 7c

FIG 8

