A SKIN TREATMENT APPARATUS AND METHOD ~~FOR IMPROVING SKIN USING A RA-EFFECT OR RA PLUS-EFFECT~~

Technical Field

[1] The present invention is for skin treatment using electricity energy, especially with the primary purpose for skin treatment for beauty, and in some cases, can be used as a direct instrument or supplement for skin cosmetic surgery.

[2] Specifically, The present invention is to give treatment for firm skin by the method and device using high frequency, which minimizes skin aging by directly stimulating dermis between epidermis and subcutaneous layer and guarantees skin improvement.

Background Art

[3] Generally, skin is the largest protection organ that covers the whole body and maintains homeostasis on surface of the body with three layers consisting of epidermis, dermis, and subcutaneous layer.

[4] Dermis is the layer beneath epidermis, directly connected to stratum basal, and mostly made up of dermis tissue, protein, glucide, glycosaminoglycans, mineral, inorganic salt, etc. in gelatinous form, and dermis consists of capillary that provides nutrition to epidermis and circulates blood, papillary layer where lymphatic duct that carries lymph is located, and reticular layer which is made up of collagenous fiber related to skin wrinkle, collagen, elastic fiber that gives elasticity to skin, elastin, and the substrate(water storage). Subcutaneous layer lies below dermis, contains plenty of fat, and attaches the skin to underlying muscle and bone at the bottom of the skin.

[5] One of the most popular treatments to prevent skin aging is massaging with nutritious substance. However, although this type of skin treatment of massaging provides nutrition to

CLAIMS

1. A ~~medical~~ skin treatment apparatus, comprising:
a plurality of electrodes~~needles~~; the electrodes are bipolar~~the needles not coupled to a human body ground, separated by a distance,~~
~~and having a length sufficient to reach a desired region of a human body when inserted into a human body~~; and
a ~~signal~~ high frequency generation module, the ~~signal~~ high frequency generation module electrically coupled to the plurality of ~~needles~~ electrodes and providing ~~electrical energy~~ a high frequency signals to the plurality of ~~needles~~ electrodes to coagulate around each electrode rather than coagulating between the electrodes. ~~to form an independent, substantially non-intersecting energy field about two or more of the needle tips.~~

2. The ~~medical~~ skin treatment apparatus of claim 1, further comprising a drive module to controllably move one or more of the plurality of ~~needles~~ electrodes along their length from a first human body region to second human body region.

3. The ~~medical~~ skin treatment apparatus of claim 1, wherein the closest neighboring electrodes have opposite polarities. ~~signal generation module applies a first alternating current electrical energy signal with a first polarity to a first subset of needles and applies a second alternating current electrical energy signal with a second, opposite polarity to a second subset of needles.~~

4. The ~~medical~~ skin treatment apparatus of claim 1~~3~~, wherein the coagulated area around the each electrode ~~energy field formed about the two or more needle tips~~ is ~~substantially~~ oval in shape.

~~5. The medical treatment apparatus of claim 3, wherein the signal generation module provides electrical energy signals to the plurality of needles to form an independent, substantially non-intersecting, substantially oval shaped energy fields about the plurality of needles tips.~~

5~~6~~. The ~~medical~~ skin treatment apparatus of claim 1, wherein ~~the medical treatment apparatus is a skin treatment apparatus and each of~~ the plurality of ~~needles~~ electrodes haves a length

sufficient to reach dermis of a ~~human body~~ skin when inserted into the skin ~~of a human body region~~.

~~7. The medical treatment apparatus of claim 1, further comprising a drive module to controllably move one or more of the plurality of needles along their length from an epidermis region to an adjacent dermis region of a human body region.~~

6~~8~~. The ~~medical~~ skin treatment apparatus of claim 1~~3~~, wherein the ~~first subset and second subset of needles comprise the~~ minimum number of the plurality of ~~needles~~ electrodes is four. ~~and the first subset of needles are evenly interspersed between the second subset of needles.~~

~~9. The medical treatment apparatus of claim 3, wherein the first subset of needles are singly interspersed between the second subset of needles.~~

7~~10~~. The ~~medical~~ skin treatment apparatus of claim 1~~3~~, wherein the ~~first and the second alternating current electrical~~ high frequency signals have a frequency from 0.5 to 10 Mhz.

~~11. The medical treatment apparatus of claim 3, wherein the first and the second alternating current electrical signals have a frequency from 1.5 to 2.5 Mhz.~~

8~~12~~. The ~~medical~~ skin treatment apparatus of claim 1, wherein the electrode is a needle. ~~each of the plurality of needles has a cross sectional shape of one of a square, rhombus, and rectangle.~~

~~13. The medical treatment apparatus of claim 3, wherein the first and the second alternating current electrical signals have a voltage level below 100 volts.~~

~~14. The medical treatment apparatus of claim 3, wherein the first and the second alternating current electrical signals have a voltage level from 20 to 40 volts.~~

9~~15~~. The ~~medical~~ skin treatment apparatus of claim 1~~3~~, wherein the ~~signal~~ high frequency generation module applies signal to ~~a first alternating current electrical energy signal with a first polarity to a first subset of needles for 0.05 to 0.8 seconds and applies a second~~

~~alternating current electrical energy signal with a second, opposite polarity to a second subset of needles~~ the plurality of electrodes for 0.05 to 0.8 seconds.

~~16. The medical treatment apparatus of claim 3, wherein the signal generation module applies a first alternating current electrical energy signal with a first polarity to a first subset of needles for 0.1 to 0.2 seconds and applies a second alternating current electrical energy signal with a second, opposite polarity to a second subset of needles for 0.1 to 0.2 seconds.~~

~~17. The medical treatment apparatus of claim 3, wherein the signal generation module applies a first alternating current electrical energy signal with a first polarity to a first subset of needles for a time interval after an off interval from 0.1 to 0.4 seconds and applies a second alternating current electrical energy signal with a second, opposite polarity to a second subset of needles for a time interval after an off interval from 0.1 to 0.4 seconds.~~

10~~8~~. The ~~medical~~ skin treatment apparatus of claim 1, wherein the ~~needles~~ electrodes have ~~a length from 0.1mm to 5.0mm and a separation~~ distance between adjacent ~~needles~~ electrodes from about 1.3~~0~~mm to 3.0mm.

~~19. The medical treatment apparatus of claim 1, wherein each of the plurality of needles has a cross sectional diameter of about 0.20mm to 0.40mm.~~

11~~20~~. The ~~medical~~ skin treatment apparatus of claim 1, wherein each of the plurality of ~~needles~~ electrodes has a ~~cross sectional~~ diameter of ~~about~~ either 0.25mm ~~to~~ or 0.30mm.

12~~21~~. The ~~medical~~ skin treatment apparatus of claim 1, wherein ~~each of~~ the ~~plurality of needles is substantially~~ electrodes are non-insulated.

13~~22~~. The ~~medical~~ skin treatment apparatus of claim 1, wherein ~~each of the plurality of needles includes an insulated section and non-insulated section~~ a portion of the dermis area of the electrode is non-insulated.

23. The ~~medical~~ skin treatment apparatus of claim 1~~22~~, wherein the electrode is insulated except for a tip of the electrode. ~~insulated section is longer than the non-insulated section along the needle length.~~

~~24. The medical treatment apparatus of claim 22, wherein the plurality of needles form a rectangular pattern.~~

~~25. The medical treatment apparatus of claim 3, further comprising a user interface to enable a user to select one the voltage level, alternating frequency, on time, and off time of the first and the second alternating current electrical signals.~~

~~26. The medical treatment apparatus of claim 2, further comprising a user interface to enable a user to select the needle depths that the drive module controllably moves one or more of the plurality of needles along their length.~~