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### LIFTING BEAUTY DEVICE USING HIGH-INTENSITY FOCUSED ULTRASOUND

#### Abstract

The present invention provides a lifting beauty device using high-intensity focused ultrasound that includes a body portion having a circumference gripped by a hand of a user and configured to generate a rotational power as the user operates an operation button exposed on a surface, and a cartridge portion that is coupled to a front side of the body portion and emits high intensity focused ultrasound (HIFU) while moving along a corresponding path by the rotational power generated by the body portion and selectively switching an emission depth in two stages depending on an operation mode, that may selectively switch an emission depth of the high-intensity focused ultrasound (HIFU) such that the high-intensity focused ultrasound (HIFU) may selectively reach an SMAS (Superficial Musculo Aponeurotic System) layer, which is a fibrous fascia layer that is part of a muscle layer, or a dermis layer.

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## Background/Summary

### TECHNICAL FIELD

[0001] The present invention relates to a lifting beauty device using high-intensity focused ultrasound, and more specifically, to a lifting beauty device using high-intensity focused ultrasound that may selectively switch an emission depth of the high-intensity focused ultrasound (HIFU) such that the high-intensity focused ultrasound (HIFU) may selectively reach an SMAS (Superficial Musculo Aponeurotic System) layer, which is a fibrous fascia layer that is part of a muscle layer, or a dermis layer.

### BACKGROUND ART

[0002] In general, as many people begins to take an interest in beauty, interest in skin beauty is also increasing day by day.

[0003] The desire for healthy skin is not limited to a beauty field, but also affects the growth of medical services to protect skin health from UV rays and various types of pollution that are becoming stronger due to the destruction of the ozone layer.

[0004] Face lifting is a wrinkle removal surgery that aims to improve the aging phenomenon of a facial area by removing sagging skin on the face and neck and pulling subcutaneous tissue to remove wrinkles.

[0005] Recently, endoscopic methods have been used to minimize scars by making fewer incisions during face lifting.

[0006] However, because the methods are invasive surgical procedures, the methods cause many difficulties for persons who undergo the procedure due to bleeding, secondary infections, pain, and long recovery periods.

[0007] Among invasive methods, advanced medical technologies such as lasers are being developed and commercialized, but there are still difficulties associated with invasive surgeries.

[0008] Therefore, the need for a technology that may beautify the skin in a non-invasive way has been increasing recently.

[0009] In general, the SMAS layer, which is part of a muscle layer, is a muscle area that is pulled when performing a face lifting surgery, and clinical results have been reported overseas that, when high-intensity focused ultrasound is used to only act on the SMAS layer without touching the epidermis, the heat from the ultrasound is transferred to a deep portion of the dermis layer, which regenerates collagen and achieves an effect of removing wrinkles and increasing skin elasticity.

[0010] In line with this trend, there is a beauty device that uses high intensity focused ultrasound (HIFU), which is a non-invasive beauty device that has recently been in the spotlight.

[0011] There is an ultrasonic beauty device that emits high intensity focused ultrasound to shallow skin tissues for skin beauty treatment to perform skin lifting or skin tightening treatment, and the ultrasonic beauty device emits the high intensity focused ultrasound (HIFU) to a subcutaneous fat layer, a dermis layer, and so on and stimulates while burning or melting and decomposing the subcutaneous biological tissues, and accordingly, wrinkles are removed, and skin elasticity is

improved.

[0012] The related art includes Korean Patent No. 10-1335476 (2013 Nov. 26).

## DISCLOSURE OF INVENTION

### Technical Problem

[0013] The present invention aims to provide a lifting beauty device using high-intensity focused ultrasound, which may emit high-intensity focused ultrasound (HIFU) at two emission depths (4.5 mm and 3.0 mm), such that the high-intensity focused ultrasound (HIFU) may reach a SMAS (Superficial Musculo Aponeurotic System) layer which is a fibrous fascia layer that is part of a muscle layer, or a dermis layer, thereby regenerating collagen to obtain an effect of removing wrinkles and increasing skin elasticity.

### Solution to Problem

[0014] According to the present invention, a lifting beauty device using high-intensity focused ultrasound includes a body portion having a circumference gripped by a hand of a user and configured to generate a rotational power as the user operates an operation button exposed on a surface; and a cartridge portion coupled to an upper side of the body portion and having an ultrasound emission head that emits high intensity focused ultrasound (HIFU) with the rotational power generated by the body portion and emits the high-intensity focused ultrasound (HIFU) in two emission depths while moving along a corresponding path.

[0015] At this time, the body portion according to the present invention includes a body housing that has an internal space having an internal length from top to bottom and includes a plurality of operation buttons on a surface, a battery accommodated on the lower side of the internal space of the body housing and electrically connected to an external power source and an input terminal to be charged with electricity, and outputting the charged electricity through an output terminal, an electric motor accommodated on an upper side of the internal space of the body housing, electrically connected to the output terminal of the battery, and causing a motor gear, which is rotatably provided on an upper side of the body housing, to rotate, and a control board provided in the internal space of the body housing, electrically connected to the electric motor and the battery, and controlling a power output of the battery based on a signal input through the operation button to control operations of the electric motor and the cartridge portion.

[0016] Here, according to the present invention, the lifting beauty device further include a coupling portion which is formed on the upper side of the body housing and into which a lower end of the cartridge portion is inserted, and a pair of connection terminals which are spaced apart from the motor gear located at an inner center of the coupling portion by a certain distance and are electrically connected to the control board, and from which power is output to the cartridge portion through the control board.

[0017] In addition, the cartridge portion according to the present invention includes a cartridge housing having an internal space, including an insertion portion inserted into the coupling portion, and having an oval-shaped opening formed in an upper side through which an ultrasonic oscillation head is movable, a rotational power transfer means accommodated on a lower side inside the cartridge housing and receiving and outputting a rotational power generated by the body portion, a head transport means mechanically connected to the rotational power transfer means in the internal space of the cartridge housing and linearly transporting the head module with the rotational power output from the rotational power transfer means, and the head module connected to the head transport means in the internal space of the cartridge housing and emitting the high-intensity focused ultrasound (HIFU) while linearly moving by the head transport means.

[0018] At this time, the rotational power transfer means according to the present invention includes a connection gear that is engaged with the motor gear, and a first bevel gear connected to the connection gear by an axis to rotate in conjunction with a rotation of the connection gear.

[0019] Also, the head transport means according to the present invention includes a rotation shaft having a second bevel gear, which is engaged perpendicularly with the first bevel gear, on one side

and having a first spur gear on an opposite side of the one side, and a transfer screw having a length that is parallel to the rotation axis and a screw thread formed in the length, and having a second spur gear, which is engaged with the first spur gear, on another side.

[0020] In addition, the head module according to the present invention includes a first head holder provided on the transfer screw and moving linearly in response to an axial rotation of the transfer screw, a second head holder coupled to an upper side of the first head holder and including an ultrasonic oscillation head that emits the high intensity focused ultrasound (HIFU), a guide pin rotatably provided on the second head holder and including semicircular guides formed on both ends, and a guide plate arranged orthogonally to a longitudinal direction of the guide pin and having a track groove that guides a guide of the guide pin along a corresponding path.

[0021] In addition, the track home of the guide plate according to the present invention includes a first high-intensity focused ultrasound emission section that limits an emission depth of the focused ultrasound to 3.0 mm, a second high-intensity focused ultrasound emission section that limits the emission depth of the focused ultrasound to 4.5 mm, and a pair of emission depth switching sections connecting one side and another side of the first high-intensity focused ultrasound emission section respectively to one side and another side of the second high-intensity focused ultrasound emission section.

#### Advantageous Effects of Invention

[0022] Effects of a lifting beauty device using high-intensity focused ultrasound according to the present invention are as follows.

[0023] High-intensity focused ultrasound (HIFU) may be emitted at two emission depths (4.5 mm and 3.0 mm), such that the high-intensity focused ultrasound (HIFU) reaches a SMAS (Superficial Musculo Aponeurotic System) layer, which is a fibrous fascia layer that is part of a muscle layer, or a dermis layer, and thus, collagen is regenerated, and thereby, an effect of wrinkle removal and increased skin elasticity may be obtained.

[0024] Also, the emission depth of the high-intensity focused ultrasound (HIFU) may be selectively switched, and thus, the replacement of an ultrasound emission plug is not necessary, which may reduce the treatment time and reduce the fatigue of an operator.

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## Description

### BRIEF DESCRIPTION OF DRAWINGS

[0025] FIG. 1 is a perspective view illustrating a lifting beauty device using high-intensity focused ultrasound, according to an embodiment of the present invention.

[0026] FIG. 2 is an exploded perspective view illustrating a configuration of a body portion and a cartridge portion according to an embodiment of the present invention.

[0027] FIG. 3 is a view illustrating a state in which a cartridge portion is separated from a body portion according to an embodiment of the present invention.

[0028] FIG. 4 is a view illustrating a rotational power transfer means, a head transport means, and a head module of a cartridge portion according to an embodiment of the present invention.

[0029] FIG. 5 is a view illustrating movement of a head module according to an embodiment of the present invention.

[0030] FIG. 6 is a view illustrating a state in which a guide of a head module is switched, according to an embodiment of the present invention.

[0031] FIG. 7 illustrates views of states in which a lifting beauty device using high-intensity focused ultrasound according to an embodiment of the present invention emits high-intensity focused ultrasound.

### BEST MODE FOR CARRYING OUT THE INVENTION

[0032] The present invention provides a lifting beauty device using high-intensity focused

ultrasound including a body portion having a circumference gripped by a hand of a user and configured to generate a rotational power as the user operates an operation button exposed on a surface; and a cartridge portion coupled to an upper side of the body portion and having an ultrasound emission head that emits high intensity focused ultrasound (HIFU) with the rotational power generated by the body portion and emits the high-intensity focused ultrasound (HIFU) in two emission depths while moving along a corresponding path, wherein the head module according to the present invention includes a first head holder provided on the transfer screw and moving linearly in response to an axial rotation of the transfer screw, a second head holder coupled to an upper side of the first head holder and including an ultrasonic oscillation head that emits the high intensity focused ultrasound (HIFU), a guide pin rotatably provided on the second head holder and including semicircular guides formed on both ends, and a guide plate arranged orthogonally to a longitudinal direction of the guide pin and having a track groove that guides a guide of the guide pin along a corresponding path, and the track home of the guide plate according to the present invention includes a first high-intensity focused ultrasound emission section that limits an emission depth of the focused ultrasound to 3.0 mm, a second high-intensity focused ultrasound emission section that limits the emission depth of the focused ultrasound to 4.5 mm, and a pair of emission depth switching sections connecting one side and another side of the first high-intensity focused ultrasound emission section respectively to one side and another side of the second high-intensity focused ultrasound emission section.

#### Mode for Carrying Out the Invention

[0033] Hereinafter, preferred embodiments according to the present invention will be described in detail with reference to the attached drawings. Prior to this, the terms or words used in the present specification and claims should not be interpreted as limited to their usual or dictionary meanings, and should be interpreted as meanings and concepts that conform to the technical idea of the present invention based on a principle that the inventor may appropriately define concepts of the terms in order to describe his or her own invention in the best way.

[0034] Therefore, the embodiments described in the present specification and configurations illustrated in the drawings are only the most preferred embodiments of the present invention, and do not represent all of the technical ideas of the present invention, and accordingly, it should be understood that there may be equivalent modification examples that may be replaced at the time of this application.

[0035] The present invention relates to a lifting beauty device using high-intensity focused ultrasound, which may selectively switch an emission depth of the high-intensity focused ultrasound (HIFU) such that high-intensity focused ultrasound (HIFU) may selectively reach an SMAS (Superficial Musculo Aponeurotic System) layer, which is a fibrous fascia layer that is part of a muscle layer, or a dermis layer, and is described below with reference to the drawings.

[0036] A lifting beauty device using high-intensity focused ultrasound according to an embodiment of the present invention to be described with reference to FIGS. 1 to 7 includes a body portion **100** and a cartridge portion **200**, and an entire shape of the ultrasonic lifting beauty device is a streamline shape, the cartridge portion **200** is located at an upper part, and the body portion **100** is located at a lower part of the cartridge portion **200**.

[0037] Accordingly, a user holds the body portion **100** with his/her hand, and moves the lifting beauty device along a skin line while a front surface of the cartridge portion **200** is in contact with the skin, and performs a lifting procedure by causing high-intensity focused ultrasound (HIFU) to be emitted to an SMAS (Superficial Musculo Aponeurotic System) layer, which is a fibrous fascia layer that is part of the muscle layer, or a deep part of a dermis layer.

[0038] Here, the body portion **100** and the cartridge portion **200** according to one embodiment of the present invention are described in detail below.

[0039] First, as the body portion **100** is gripped by a user's hand around a circumference thereof and a user operates multiple operation buttons **112** exposed on a surface, the body portion **100**

generates a power output and rotational power that may drive the cartridge portion **200**.

[0040] At this time, the body portion **100** includes a body housing **110**, a battery **120**, and an electric motor **130**, and the body housing **110** forms an internal space, and the battery **120** and the electric motor **130** are built in the internal space.

[0041] Here, a coupling portion **111** is formed on an upper side of the body housing **110** which a lower side of the cartridge portion **200** is inserted into to be connected to, and a motor gear **131** that provides rotational power, which is a power for moving an ultrasonic oscillation head **300** equipped in the cartridge portion **200**, is provided at an internal center of the coupling portion **111**, and a pair of terminals **121** are provided on the left and right sides of the motor gear **131** to supply power for driving the ultrasonic oscillation head **300**.

[0042] Also, support pieces **113** are formed to extend in an arc shape respectively from upper left and right sides of the coupling portion **111** toward the cartridge portion **200**, and the support pieces **113** support the cartridge portion **200** coupled to the coupling portion **111** so as not to be separated from the coupling portion **111** by a physical force applied from a side of the cartridge portion **200**.

[0043] In addition, it is preferable that the coupling portion **111** further includes a catch means **114** that prevents the cartridge portion **200** inserted in the coupling portion **111** from being easily separated.

[0044] The catch means **114** is supported by an elastic body (not illustrated) and connected to a push button formed on a surface of the body housing **110**, such that the cartridge portion **200** is released from engagement by moving forward and backward by a forward and backward force applied through the push button.

[0045] In addition, the battery **120** built on a lower side in an internal space of the body housing **110** selectively supplies power to the electric motor **130** and the cartridge portion **200**, and is preferably configured with a rechargeable battery that is charged with electricity.

[0046] At this time, the battery **120** is electrically connected to the charging terminal **115** provided at a lower portion of the body housing **110** and is connected to an external power source through the charging terminal **115** to charge electricity.

[0047] Also, the battery **120** is electrically connected to a control board (not illustrated) built in the body housing **110**, and the control board is electrically connected to an operation button **112** to control power supplied to the electric motor **130** and the cartridge portion **200** according to on/off of a device, selection of an operation mode, selection of an emission depth, and so on.

[0048] In addition, the battery **120** is electrically connected to the pair of terminals **121** provided in the coupling portion **111** through the control board, and supplies power to the ultrasonic oscillation head **300** provided in the cartridge portion **200**.

[0049] In addition, the electric motor **130** built in an upper portion of the internal space of the body housing **110** is electrically connected to the battery **120** and the control board like a normal electric motor, and generates a rotational power of forward or reverse rotation with the power supplied from the battery **120** under the control by the control board.

[0050] At this time, a rotational axis of the electric motor **130** is coupled to the motor gear **131** located in the center of the coupling portion **111** of the body housing **110**, and the motor gear **131** is a crown gear and rotates forward or reversely in conjunction with the rotational axis of the electric motor **130**.

[0051] The cartridge portion **200** is connected to the coupling portion **111** of the body portion **100**, and selectively switches an emission depth in two stages and emits high intensity focused ultrasound (HIFU) using the power generated by the body portion **100**.

[0052] Here, in more detail, the cartridge portion **200** according to one embodiment of the present invention includes a cartridge housing **210**, a rotational power transfer means **220**, a head transport means **230**, and a head module **240**.

[0053] First, the cartridge housing **210** forms an internal space, and the rotational power transfer means **220**, the head transport means **230**, the head module **240**, and a guide member **250** are built

in the internal space.

[0054] Referring to FIGS. 4 and 5, the rotational power transfer means **220** transfers the rotational power generated by the electric motor **130** of the body portion **100** to the head transport means **230**, and includes a connection gear **221**, which is engaged with the motor gear **131**, and a first bevel gear **222** that is axially connected to the connection gear **221**.

[0055] At this time, it is preferable that the connection gear **221** is also formed as a crown gear so as to be able to be engaged with the motor gear **131**, and a shaft connecting the connection gear **221** to the first bevel gear **222** is fixed with a bearing or so on so as to be able to rotate in the cartridge housing **210**.

[0056] Therefore, the rotational power transfer means **220** receives the rotational power generated by the electric motor **130** of the body portion **100** through the connection gear **221** and outputs the rotational power to the first bevel gear **222** connected to the connection gear **221** by an axis.

[0057] Here, a pair of connecting pins **211** are provided at a lower portion of the cartridge housing **210** at positions corresponding to the pair of terminal terminals **121** centered on the connection gear **221** of the rotational power transfer means **220**, and the connecting pins **211** are electrically connected to the ultrasonic oscillating head **300**, and when the cartridge portion **200** is connected to the connecting portion **111** of the body portion **100**, the cartridge portion **200** may each be inserted into the terminal terminals **121** and electrically connected thereto.

[0058] Accordingly, electricity is supplied to the ultrasonic oscillation head **300** provided in the cartridge portion **200** by a connection between a terminal **121** and the connection pin **211**.

[0059] In addition, the head transport means **230** is mechanically connected to the rotational power transfer means **220** to linearly transfer the head module **240**.

[0060] The head transport means **230** includes a rotational shaft **231** and a transfer screw **234** of which axes are parallel to each other, and a second bevel gear **232** is provided on one side of the rotational shaft **231** so as to be engaged with the first bevel gear **222** of the rotational power transfer means **220** at right angles to switch a rotational direction to be orthogonal, and a first spur gear **233** is provided on the other side of the rotational shaft **231** such that the first spur gear **233** also rotates due to the axial rotation of the rotational shaft **231**.

[0061] A second spur gear **235**, which is engaged with the first spur gear **233**, is provided on the other side of the transfer screw **234** provided to be parallel to the rotational shaft **231** such that the rotational shaft **231** is rotated by the rotational power transferred through the second bevel gear **232** engaged with the first bevel gear **222** of the rotational power transfer means **220**, and when the first spur gear **233** rotates due to the rotation of the rotational shaft **231**, the engaged second spur gear **235** rotates, causing the feed screw **234** to rotate, and thus the head module **240** connected to the feed screw **234** is linearly transported.

[0062] The head module **240** includes a first head holder **241** that is coupled to the feed screw **234** and moves in an axial direction of the feed screw **234** according to the rotation of the feed screw **234**.

[0063] At this time, the first head holder **241** has a 'U' shape, and a cam block **242** is formed to extend from a lower side of the first head holder **241**, and the cam block **242** may check a position of the ultrasonic oscillation head **300** in correspondence with a pair of position sensors **260** arranged on one end and the other end of the transfer screw **234**.

[0064] In addition, a second head holder **243** is coupled to an upper side of the first head holder **241**, and the second head holder **243** has the ultrasonic oscillation head **300** mounted on a front end thereof, and is coupled between upper portions of the first head holder **241** forming a 'U' shape.

[0065] At this time, coupling protrusions are respectively formed on the left and right sides of the second head holder **243**, and coupling holes, into which the coupling protrusions are respectively inserted, are formed in the first head holder **241**, and the coupling holes are formed as long holes each having a length from top to bottom, and accordingly, the second head holder **243** may move as much as a length of the coupling hole on an upper side of the first head holder **241**.

[0066] Referring to FIG. 4 to FIG. 7, the second head holder **243** includes a guide rotation pin **244**, and the guide rotation pin **244** is provided to be rotatable in the second head holder **243**, and a guide **245** having a semicircular cross-section is formed at both ends.

[0067] At this time, the guide **245** of the guide rotation pin **244** corresponds to a pair of guide plates **250** provided at the front and rear of the head module **240**, and a track groove **251** that guides the guide **245** of the guide rotation pin **244** is formed in the guide plate **250**.

[0068] It is preferable that the track groove **251** is formed into an elliptical shape by combining the first and second high-intensity focused ultrasonic emission portions **251a** and **251b** and emission depth transition portions **251c** and **251d** on the left and right sides, and the internal side of the track groove **251** is in close contact with a flat surface of the semicircular guide **245**, and an outer side of the track groove **251** is in close contact with the curved portion of the guide **245**.

[0069] Here, a first high-intensity focused ultrasound emission section **251a** and a second high-intensity focused ultrasound emission section **251b** are sections in which the ultrasonic oscillation head **300** coupled to the second head holder **243** emits high-intensity focused ultrasound (HIFU), and it is preferable that the first high-intensity focused ultrasound emission section **251a** and the second high-intensity focused ultrasound emission section **251b** are straight sections that are parallel to each other, and it is preferable that the first high-intensity focused ultrasound emission section **251a** limits an emission depth of the focused ultrasound to 3.0 mm, and the second high-intensity focused ultrasound emission section limits an emission depth of the focused ultrasound to 4.5 mm.

[0070] Therefore, according to an embodiment of the present invention, a lifting beauty device using high-intensity focused ultrasound has two emission depths of focused ultrasounds, 4.5 mm and 3.0 mm, such that high-intensity focused ultrasounds may be respectively and selectively emitted to the SMAS (Superficial Musculo Aponeurotic System) layer which is a fibrous fascia layer and a dermis layer, or the high-intensity focused ultrasound may be emitted to both the SMAS (Superficial Musculo Aponeurotic System) layer and the dermis layer.

[0071] In addition, emission depth switching section **251c** and **251d** where emission depths are switched is formed by including a straight path and a curved path such that the guide **245** may rotate along the track groove **251**.

[0072] Therefore, it is preferable that the guide **245** moving along a track home **251** moves only in one direction along the track home **251**.

[0073] The present invention is described with reference to the embodiments illustrated in the drawing, but the embodiments are merely examples, and those skilled in the art will understand that various modifications and equivalent other embodiments may be derived therefrom. Therefore, the true technical protection scope of the present invention should be determined by the technical idea of the attached patent claims.

## Claims

1. A lifting beauty device using high-intensity focused ultrasound, the lifting beauty device comprising: a body portion having a circumference gripped by a hand of a user and configured to generate a rotational power as the user operates an operation button exposed on a surface; and a cartridge portion coupled to an upper side of the body portion and having an ultrasound emission head that emits high intensity focused ultrasound (HIFU) with the rotational power generated by the body portion and emits the high-intensity focused ultrasound (HIFU) in two emission depths while moving along a corresponding path.
2. The lifting beauty device using the high-intensity focused ultrasound of claim 1, wherein the body portion includes: a body housing that has an internal space having an internal length from top to bottom and includes a plurality of operation buttons on a surface; a battery accommodated on the lower side of the internal space of the body housing and electrically connected to an external power



source and an input terminal to be charged with electricity, and outputting the charged electricity through an output terminal; an electric motor accommodated on an upper side of the internal space of the body housing, electrically connected to the output terminal of the battery, and causing a motor gear, which is rotatably provided on an upper side of the body housing, to rotate; and a control board provided in the internal space of the body housing, electrically connected to the electric motor and the battery, and controlling a power output of the battery based on a signal input through the operation button to control operations of the electric motor and the cartridge portion.

**3.** The lifting beauty device using the high-intensity focused ultrasound of claim 2, further comprising: a coupling portion which is formed on the upper side of the body housing and into which a lower end of the cartridge portion is inserted; and a pair of connection terminals which are spaced apart from the motor gear located at an inner center of the coupling portion by a certain distance and are electrically connected to the control board, and from which power is output to the cartridge portion through the control board.

**4.** The lifting beauty device using the high-intensity focused ultrasound of claim 3, wherein the cartridge portion includes: a cartridge housing having an internal space, including an insertion portion inserted into the coupling portion, and having an oval-shaped opening formed in an upper side through which an ultrasonic oscillation head is movable; a rotational power transfer means accommodated on a lower side inside the cartridge housing and receiving and outputting a rotational power generated by the body portion; a head transport means mechanically connected to the rotational power transfer means in the internal space of the cartridge housing and linearly transporting the head module with the rotational power output from the rotational power transfer means; and the head module connected to the head transport means in the internal space of the cartridge housing and emitting the high-intensity focused ultrasound (HIFU) while linearly moving by the head transport means.

**5.** The lifting beauty device using the high-intensity focused ultrasound of claim 4, wherein the rotational power transfer means includes: a connection gear that is engaged with the motor gear; and a first bevel gear connected to the connection gear by an axis to rotate in conjunction with a rotation of the connection gear.

**6.** The lifting beauty device using the high-intensity focused ultrasound of claim 5, wherein the head transport means includes: a rotation shaft having a second bevel gear, which is engaged perpendicularly with the first bevel gear, on one side and having a first spur gear on an opposite side of the one side; and a transfer screw having a length that is parallel to the rotation axis and a screw thread formed in the length, and having a second spur gear, which is engaged with the first spur gear, on another side.

**7.** The lifting beauty device using the high-intensity focused ultrasound of claim 6, wherein the head module includes: a first head holder provided on the transfer screw and moving linearly in response to an axial rotation of the transfer screw; a second head holder coupled to an upper side of the first head holder and including an ultrasonic oscillation head that emits the high intensity focused ultrasound (HIFU); a guide pin rotatably provided on the second head holder and including semicircular guides formed on both ends; and a guide plate arranged orthogonally to a longitudinal direction of the guide pin and having a track groove that guides a guide of the guide pin along a corresponding path.

**8.** The lifting beauty device using the high-intensity focused ultrasound of claim 7, wherein the track home of the guide plate includes: a first high-intensity focused ultrasound emission section that limits an emission depth of the focused ultrasound to 3.0 mm; a second high-intensity focused ultrasound emission section that limits the emission depth of the focused ultrasound to 4.5 mm; and a pair of emission depth switching sections connecting one side and another side of the first high-intensity focused ultrasound emission section respectively to one side and another side of the second high-intensity focused ultrasound emission section.

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