

MESSAGE DEVICE FOR EYE HEALTH CARE

BACKGROUND OF THE INVENTION

1. Field of Invention

The invention relates to massage devices and more particularly to a device for
5 massaging eyes with improved characteristics.

2. Description of Related Art

A conventional eyes massage device comprises a support frame, a vibration
generator, and a massage plate having a plurality of small projections being
actuated by the vibration generator to massage the eyes. However, the well known
10 eyes massage device suffers from a disadvantage. In detail, its massaging effect is
done by vibration rather than by rubbing and kneading. Hence, its massaging
effect is poor.

SUMMARY OF THE INVENTION

The invention is directed to an effective, much compact eyes massage device
15 for overcoming the disadvantage of the prior art.

It is therefore one object of the invention to provide an eyes massage device
comprising a support frame; a drive source disposed in the support frame and
comprising two drive shafts; two massaging assemblies comprising a plating
member and a plurality of massaging projections extending out of the plating
20 member; and two vibration generators corresponding to the massaging assemblies
respectively, each of the vibration generators comprising a driven member, an
eccentric shaft, a rotatable disc plate, and a planar limiting member for confining
the rotatable disc plate thereon, wherein opposite portions of the eccentric shaft
are secured to the rotatable disc plate and the driven member respectively, and the
25 plating member is secured to the corresponding rotatable disc plate so that the
drive source activates to rotate the driven members and eccentrically rotate each

of the rotatable disc plates about a rotation axis of the driven member with the rotatable disc plates being rotatably supported by the planar limiting members.

In a first aspect of the invention each of the vibration generators further comprises a seat secured to an inner surface of the support frame, the planar
5 limiting member being mounted on the seat.

In a second aspect of the invention the rotatable disc plate and the driven member are mounted on two opposite surfaces of the seat respectively with the eccentric shaft disposed in a central portion of the seat.

In a third aspect of the invention the planar limiting member comprises at least
10 two cranks including a first axle extending in a first direction and a second axle extending in a second direction opposing the first direction, the first and second axles of the crank being offset with respect to each other, wherein each of the cranks rotates about the first and second axles thereof, and wherein one end of the first axle is secured to the seat and one end of the second axle is secured to the
15 rotatable disc plate.

In a fourth aspect of the invention the number of the crank is four, and wherein the four cranks are arranged as four corners of a virtual rectangle.

In a fifth aspect of the invention the massaging projection comprises an elastomeric body, an upper section, a bottom protrusion, and an axial positioning
20 rod, and wherein the body has a centrally bulged hollow, the upper section is disposed on a top of the hollow, the bottom protrusion is disposed on a bottom of the hollow and secured to the plating member, the bottom protrusion having an axial bore, the positioning rod is disposed in the hollow, the upper section is supported by the positioning rod, and a lower portion of the positioning rod is
25 slidably inserted into the bore so as to move the positioning rod along the bore in response to pressing the body.

In a sixth aspect of the invention each of the vibration generators further comprises a drive member coupled to the drive shaft, wherein the drive member is a drive gear, wherein the driven member is a driven gear meshed with the drive member, and wherein an axis of the driven gear is at an angle of less than 90 degrees with respect to an axis of the drive gear.

In a seventh aspect of the invention the drive gear comprises a shaft member, and a sleeve member put on the shaft member and secured to the seat.

In an eighth aspect of the invention the drive source is a DC motor having two aligned, spaced drive shafts, and wherein the drive source further comprises two flexible couplings each interconnecting the drive shaft and the vibration generator so that a rotation of the drive shaft rotates the vibration generator.

In a ninth aspect of the invention the vibration generator further comprises a bracket including a central arc groove and two elongated troughs on both sides of the groove, and wherein the plating member comprises an elongated bar inserted into the groove for fastening the massaging assembly and the bracket together.

The invention has the following advantages: Each rotatable disc plate eccentrically rotates in a range confined by the planar limiting member by securing to an axis of the eccentric shaft so that the area surrounding the eyes can be effectively massaged. The rotation of the rotatable disc plate on a plane can greatly decrease height of the vibration generator. Hence, the size of the eyes massage device can be decreased greatly with weight being greatly reduced also.

The above and other objects, features and advantages of the invention will become apparent from the following detailed description taken with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an eyes massage device according to a

preferred embodiment of the invention;

FIG. 2 is an exploded view of the eyes massage device;

FIG. 3 is a view similar to FIG. 1 but with both the massaging assemblies and the inner frame being removed;

FIGS. 4 and 5 are perspective views of the vibration generator viewed from rear and front respectively;

FIG. 6 is an exploded view of the vibration generator;

FIG. 7 is a front view of the vibration generator;

FIG. 8 is a sectional view of the vibration generator;

FIG. 9 is a perspective view of the massaging projection;

FIG. 10 is a longitudinal sectional view of the massaging projection; and

FIG. 11 is an exploded view of the massaging projection.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 to 11, an eyes massage device in accordance with a preferred embodiment of the invention comprises a support frame 1, a drive source 2, two massaging assemblies 3, and two vibration generators 4. The drive source 2 is provided in the support frame 1 and comprises two outputs in which one output is for one vibration generator 4 and one massaging assembly 3 and the other output is for the other vibration generator 4 and the other massaging assembly 3. In short, the two outputs are adapted to actuate the two vibration generators 4 which in turn are adapted to actuate the massaging assemblies 3 to cyclically move on a plane. As a result, eyes are effectively massaged.

The drive source 2 comprises two aligned, spaced drive shafts 21. The drive source 2 is implemented as a battery powered DC (direct current) motor 2 having a switch (not shown) and two aligned, spaced drive shafts 21. Alternatively, the DC motor 2 is powered by an external power source via an AC (alternating current)

adapter in other embodiments. The support frame 1 is shaped to conform to the facial contour of an ordinary person so that the eyes massage device may be comfortably worn on the area surrounding the eyes. The support frame 1 comprises an outer protective frame section 11 and an inner frame section 12. The
5 outer protective frame section 11 comprises an arcuate first protective layer 111 and an arcuate second protective layer 112 which is secured to an inner surface of the first protective layer 111. The inner frame section 12 comprises an arcuate first frame member 121 and an arcuate second frame member 122 which is secured to an inner surface of the first frame member 121. The first frame member 121, the
10 second frame member 122, the first protective layer 111, and the second protective layer 112 are complementary members one another in which the first frame member 121 is secured to an inner surface of the second protective layer 112 and the second frame member 122 is secured to an inner surface of the first frame member 121.

15 The vibration generators 4 are independent and are provided in an inner surface of the outer protective frame section 11 and are positioned to correspond to both eyes of a wearer respectively. The vibration generator 4 comprises a drive gear 41, a coupling sleeve 42, and a plurality of components, from a position proximate the outer protective frame section 11 toward a position distal the outer
20 protective frame section 11 (i.e., about perpendicular to the face), a driven gear 43, an eccentric shaft 44, a coupling disc 45, a seat 46, four cranks 47, a rotatable disc plate 48, and a bracket 49.

The drive gear 41 is cylindrical and has a shaft 411 extending therefrom. One ends of both the shaft 411 and a flexible coupling 22 are disposed in the coupling
25 sleeve 42 to secure thereto respectively. The other end of the flexible coupling 22 is secured to the drive shaft 21. Thus, an activation of the drive source 2 may

rotate the drive gear 41 via the connection of the drive shaft 21, the flexible coupling 22, and the shaft 411. The drive gear 41 is meshed with the driven gear 43. An axis of the driven gear 43 is at an angle of less than 90 degrees with respect to an axis of the drive gear 41. The axis of the drive gear 41 is substantially parallel
5 with the face of the wearer. The seat 46 comprises a plate 461, a plurality of bossed holes 462 extending toward the outer protective frame section 11, an axial bearing hole 463 through the plate 461, four holes 464 arranged as four corners of a virtual rectangle around the bearing hole 463, and a plurality of screws (not shown) driven through the outer protective frame section 11 into the bossed holes
10 462 to secure the seat 46 to an inner surface of the outer protective frame section 11. The eccentric shaft 44 is provided in the bearing hole 463. An upper portion of the eccentric shaft 44 is secured to the disc plate 48 and a lower portion thereof is secured to the driven gear 43. For securing the eccentric shaft 44 to the driven gear 43, the eccentric shaft 44 has four positioning pegs 441 extending out of its
15 bottom and the driven gear 43 has four holes 431 shaped in complementary to the positioning pegs 441. Hence, the positioning pegs 441 may insert into the holes 431. Next, a screw 432 is driven through the driven gear 43 into the eccentric shaft 44 to secure them together. The eccentric shaft 44 further comprises a top slit 442. The coupling disc 45 comprises a bottom ridge 451 and a circular member 452.
20 The ridge 451 is shaped to insert into the slit 442 for fastening. The crank 47 comprises a first axle 471 extending in a first direction and a second axle 472 extending in a second opposite direction. The first axles 471 are shaped to insert into the holes 464 for fastening. The second axles 472 are shaped to insert into holes 482 of the disc plate 48 for fastening. The crank 47 can freely rotate about its
25 first and second axles 471, 472. The first and second axles 471, 472 are offset with respect to each other. The four cranks 47 are arranged as four corners of a virtual

rectangle. The disc plate 48 is circular and comprises, in addition to the holes 482, a stepped diameter axial hole 481 with the circular member 452 fitted therein, a screw 483 driven into the axial hole 481 rested upon an internal shoulder 484 of the axial hole 481 and sequentially driven through the coupling disc 45 into the slit 442 to secure the disc plate 48, the coupling disc 45, and the eccentric shaft 44 together.

The bracket 49 comprises a central arc groove 491 and two elongated troughs 492 on both sides of the arc groove 491 respectively. The disc plate 48 further comprises two aligned threaded holes 485 spaced from the axial hole 481. The threaded holes 485 correspond to the troughs 492 respectively. Two adjustment screws (not shown) are driven through the troughs 492 into the threaded holes 485 to slidably secure the bracket 49 to the disc plate 48. The massaging assembly 3 comprises a bent plate 31 and a plurality of massaging projections 32 extending rearward from the bent plate 31. The bent plate 31 comprises an elongated bar 311 facing the outer protective frame section 11. The bar 311 is inserted into the groove 491 for fastening the massaging assembly 3 and the bracket 49 together. In an adjustment operation, a user may unfasten the adjustment screws and then move the brackets 49 toward each other or away from each other. As a result, the bent plates 31 move same for position adjustment. This is an operation for enabling the eyes massage device to accommodate the different face contours.

The seat 46 further comprises two opposite raised members 466 with a bottom of the disc plate 48 being supported thereon. A sleeve member 412 is threadedly secured to the seat 46 and put on the shaft 411. But a rotation of the shaft 411 will not rotate the sleeve member 412. The vibration generator 4 further comprises an annular bearing 40 put on the eccentric shaft 44 to securely dispose in the bearing hole 463.

The massaging projection 32 comprises a body 321, an upper section 322, a bottom protrusion 323, and an axial positioning rod 320. The body 321, the upper section 322, the bottom protrusion 323, and the axial positioning rod 320 are axially aligned. The body 321 is made of elastomeric material so as to be flexibly deformable. The body 321 has a centrally bulged hollow 326. A first well 327 is provided on an upper portion of the body 32 and a second well 328 is provided on a lower portion thereof. The upper section 322 is provided in the hollow 326 to be fastened in the first well 327. The bottom protrusion 323 comprises a first member 324 and a second member 325 in which the first member 324 has an axial bore 329. The second member 325 is inserted into the second well 328 for fastening. The second member 325 is secured to the bent plate 31. The positioning rod 320 is provided in the hollow 326 and has its top fastened in the upper section 322 and its bottom inserted into the bore 329 for fastening. Pressing the bodies 321 onto the area surrounding the eyes will flexibly compress and deform the bodies 321. Also, the positioning rods 320 in the bore 329 move toward the outer protective frame section 11. To the contrary, releasing the bodies 321 will return the bodies 321 to its original shape and move the positioning rods 320 away from the outer protective frame section 11. The provision of the positioning rod 320 can ensure a precise movement of the body 321 in a massage operation.

The operation of the eyes massage device is summarized below. First, activate the motor by turning the switch to on in order to rotate the drive shafts. And in turn, the drive gears rotate via the coupling of the drive shafts and the shafts of the drive gears in the flexible couplings. And in turn, the driven gears rotate as driven by the drive gears. The driven gears are secured to the eccentric shafts which are in turn secured to the rotatable disc plates. Hence, each of the rotatable disc plates eccentrically rotates about a rotation axis of the driven gear. The cranks

of the vibration generator are rotatably interconnected the seat and the rotatable disc plate. Also, the four cranks are arranged as four corners of a virtual rectangle. Thus, the rotatable disc plates cyclically rotate in a confined range. That is, the rotatable disc plate rotates on a plane by securing to an eccentric axis of the eccentric shaft. As a result, the area surrounding the eyes is effectively massaged.

As envisaged by the invention, the rotation of the rotatable disc plate on a plane can greatly decrease height of the vibration generator. Hence, the size of the eyes massage device can be decreased greatly with weight being greatly reduced also.

As further envisaged by the invention, the rotation of the rotatable disc plate is confined on a plane, i.e., a planar limiting member, by securing to an eccentric axis of the eccentric shaft. The planar limiting member can be implemented by only two or three cranks in other embodiments.

While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

WHAT IS CLAIMED IS:

1. An eyes massage device comprising:

a support frame;

a drive source disposed in the support frame and comprising two drive shafts;

5 two massaging assemblies comprising a plating member and a plurality of massaging projections extending out of the plating member; and

two vibration generators corresponding to the massaging assemblies respectively, each of the vibration generators comprising a driven member, an eccentric shaft, a rotatable disc plate, and a planar limiting member for confining

10 the rotatable disc plate thereon,

wherein opposite portions of the eccentric shaft are secured to the rotatable disc plate and the driven member respectively, and the plating member is secured to the corresponding rotatable disc plate so that the drive source activates to rotate the driven members and eccentrically rotate each of the rotatable disc plates about
15 a rotation axis of the driven member with the rotatable disc plates being rotatably supported by the planar limiting members.

2. The eyes massage device of claim 1, wherein each of the vibration generators further comprises a seat secured to an inner surface of the support frame, the planar limiting member being mounted on the seat.

20 3. The eyes massage device of claim 2, wherein the rotatable disc plate and the driven member are mounted on two opposite surfaces of the seat respectively with the eccentric shaft disposed in a central portion of the seat.

4. The eyes massage device of claim 2 or 3, wherein the planar limiting member comprises at least two cranks including a first axle extending in a first direction and
25 a second axle extending in a second direction opposing the first direction, the first and second axles of the crank being offset with respect to each other, wherein

each of the cranks rotates about the first and second axles thereof, and wherein one end of the first axle is secured to the seat and one end of the second axle is secured to the rotatable disc plate.

5 5. The eyes massage device of claim 4, wherein the number of the crank is four, and wherein the four cranks are arranged as four corners of a virtual rectangle.

6. The eyes massage device of claim 1, wherein the massaging projection comprises an elastomeric body, an upper section, a bottom protrusion, and an axial positioning rod, and wherein the body has a centrally bulged hollow, the upper section is disposed on a top of the hollow, the bottom protrusion is disposed
10 on a bottom of the hollow and secured to the plating member, the bottom protrusion having an axial bore, the positioning rod is disposed in the hollow, the upper section is supported by the positioning rod, and a lower portion of the positioning rod is slidably inserted into the bore so as to move the positioning rod along the bore in response to pressing the body.

15 7. The eyes massage device of claim 2, wherein each of the vibration generators further comprises a drive member coupled to the drive shaft, wherein the drive member is a drive gear, wherein the driven member is a driven gear meshed with the drive member, and wherein an axis of the driven gear is at an angle of less than 90 degrees with respect to an axis of the drive gear.

20 8. The eyes massage device of claim 7, wherein the drive gear comprises a shaft member and a sleeve member put on the shaft member and secured to the seat.

9. The eyes massage device of claim 1, wherein the drive source is a DC (direct current) motor having two aligned, spaced drive shafts, and wherein the drive source further comprises two flexible couplings each interconnecting the drive
25 shaft and the vibration generator so that a rotation of the drive shaft rotates the vibration generator.

10. The eyes massage device of claim 1, wherein the vibration generator further comprises a bracket including a central arc groove and two elongated troughs on both sides of the groove, and wherein the plating member comprises an elongated bar inserted into the groove for fastening the massaging assembly and the bracket together.