

DESCRIPTION

Title of Invention: MASSAGER

Technical Field

[0001] The present invention relates to a massager capable of performing massage, such as kneading massage, on a massage treatment target area, e.g. the hand, of a user held in a sandwiched state therein.

Background Art

[0002] Commercially available conventional massagers include those designed to massage specific areas, i.e., limited massage-treatment target areas, of user's body. Examples of such massagers include leg massagers designed to massage user's lower limbs such as calves and feet.

There have also been developed hand massagers designed to massage user's hands and more. An example of such hand massagers is disclosed in Patent Literature 1.

Prior Art Reference

Citation List

[0003]

Patent Literature 1: Japanese Unexamined Patent

Publication JP-A 2020-031792

Summary of Invention

Technical Problem

[0004] However, during pressure massage on the hand of

a user using an inflatable and deflatable air-bag assembly in a hand massager such as is disclosed in Patent Literature 1, the air-bag assembly may press the hand excessively, causing painful discomfort to the user. In this case, the hand massager fails to provide comfortable massage treatment to the user.

Furthermore, individual users have different hand (finger, palm, etc.) sizes and thicknesses. As a problem involved in a hand massager, such as is disclosed in Patent Literature 1, in which user's fingers are to be inserted, for example, a user with large hands may not be able to put the fingers, or may get the fingers stuck in the hand massager.

[0005] Hand message treatment by a massage practitioner includes, in addition to pressing massage, highly effective massage such as to hold user's hand and stretch the hand lengthwise, namely kneading massage and stretching. Unfortunately, the massager disclosed in Patent Literature 1 is not configured to perform such a stretching operation on user's hands.

[0006] In view of the drawbacks as discussed supra, an object of the present invention is to provide a massager that performs kneading massage and stretching on user's hand held in a sandwiched state therein, can be used for hands of any size, and provides effective massage to users.

Solution to Problem

[0007] In order to fulfill the above object, the present invention adopts the following technical means.

A massager embodying the present invention comprises: an insertion recess into which a first treatment target area and a second treatment target area continuous with the first treatment target area can be inserted; a first massage unit to massage the first treatment target area received in a sandwiched state in the insertion recess; a second massage unit to massage the second treatment target area received in a sandwiched state in the insertion recess; and a driver to drive the first massage unit and the second massage unit. In this construction, the first massage unit is located toward a front side of the massager, and the second massage unit is located toward a back side of the massager. The first massage unit and the second massage unit are movable toward and away from each other in a front-rear direction.

[0008] In the present invention, it is preferable that, in conditions where the first massage unit and the second massage unit hold in a sandwiching manner the first treatment target area and the second treatment target area, respectively, the first massage unit and the second massage unit are moved away from each other in the front-rear direction, thereby stretching the first treatment target

area and the second treatment target area.

In the present invention, it is preferable that the first massage unit includes a pair of opposed left-hand and right-hand first massaging members to massage the first treatment target area sandwiched therebetween from both sides in a right-left direction, and the second massage unit includes a pair of opposed left-hand and right-hand second massaging members to massage the second treatment target area sandwiched therebetween from both sides in the right-left direction, and that the following operation is repeated: when the first massage unit and the second massage unit moving toward each other in the front-rear direction reach their respective predetermined positions, then the paired left-hand and right-hand first massaging members move toward each other, and the paired left-hand and right-hand second massaging members move toward each other, and, when the first massage unit and the second massage unit moving away from each other in the front-rear direction reach their respective predetermined positions, then the paired left-hand and right-hand first massaging members move away each other, and the paired left-hand and right-hand second massaging members move away from each other.

[0009] In the present invention, it is preferable that the massager comprises: a rotating shaft to rotate under a

rotational driving force outputted from the driver; a first rock converter to convert the rotational driving force on the rotating shaft into reciprocal rocking motion for approaching-separating movement, and impart back-and-forth and side-to-side rocking motion to the paired left-hand and right-hand first massaging members; and a second rock converter to convert the rotational driving force on the rotating shaft into reciprocal rocking motion for approaching-separating movement, and impart back-and-forth and side-to-side rocking motion to the paired left-hand and right-hand second massaging members, and that the first rock converter and the second rock converter, while allowing synchronization of reciprocal rocking motion, perform conversion into rocking motion corresponding to a repeat of mutual approaching-separating movement of the first massage unit and the second massage unit in the front-rear direction, and conversion into rocking motion corresponding to a repeat of holding-releasing movement of the paired left-hand and right-hand first massaging members, as well as holding-releasing movement of the paired left-hand and right-hand second massaging members, in the right-left direction.

[0010] In the present invention, it is preferable that the first rock converter includes: a first rotating boss member to eccentrically rotate with respect to the rotating

shaft, the first rotating boss member having a first cam surface inclined with respect to an axis of the rotating shaft; a first annular fit provided in the first massaging member, the first annular fit being fitted about an outer edge of the first rotating boss member; and a first rotation restrainer to restrain the first massaging member from rotating together with the rotating shaft, that the second rock converter includes: a second rotating boss member to eccentrically rotate with respect to the rotating shaft, the second rotating boss member having a second cam surface inclined with respect to the axis of the rotating shaft; a second annular fit provided in the second massaging member, the second annular fit being fitted about an outer edge of the second rotating boss member; and a second rotation restrainer to restrain the second massaging member from rotating together with the rotating shaft, and that the first cam surface and the second cam surface are inclined in different directions with respect to a direction axially of the rotating shaft.

[0011] In the present invention, it is preferable that the massager comprises: a shaft angle detector to detect an angle of rotation of the rotating shaft; and a controller to control drive operation of the first massage unit and the second massage unit, and that, when the shaft angle detector detects a predetermined rotation angle of the

rotating shaft, the controller recognizes that the paired left-hand and right-hand first massaging members sandwich and hold the first treatment target area from both sides in the right-left direction, and the paired left-hand and right-hand second massaging members sandwich and hold the second treatment target area from both sides in the right-left direction, and keeps the treatment target areas in a sandwiched state until the first massage unit and the second massage unit moving away from each other in the front-rear direction reach their respective predetermined positions.

[0012] In the present invention, it is preferable that each of a spacing between the paired left-hand and right-hand first massaging members in the right-left direction and a spacing between the paired left-hand and right-hand second massaging members in the right-left direction can be widened.

In the present invention, it is preferable that the massager comprises: a first connecting rod member facing horizontally and outwardly with respect to the rotating shaft, the first connecting rod member having a front end coupled to a lengthwise intermediate location of the first massaging member; the first rotating boss member mounted for unitary rotation with the rotating shaft; the first annular fit disposed on a base-end side of the first

connecting rod member and fitted about the outer edge of the first rotating boss member; and a first resilient member horizontally laid on a base-end side of the first massaging member, that the first resilient member is mounted so as to lie between the base-end sides of, respectively, the paired left-hand and right-hand first massaging members in the right-left direction, and that the spacing between the paired left-hand and right-hand first massaging members in the right-left direction is widened when the first resilient member is caused to contract by the first massaging members.

[0013] In the present invention, it is preferable that, when front ends of, respectively, the paired left-hand and right-hand first massaging members move away from each other, each of the first massaging members rotates about the front end of the first connecting rod member with consequent contraction of the first resilient member, thereby providing wider spacing between the paired left-hand and right-hand first massaging members in the right-left direction.

In the present invention, it is preferable that the massager comprises: a second connecting rod member facing horizontally and outwardly with respect to the rotating shaft, the second connecting rod member having a front end coupled to a lengthwise intermediate location of the second

massaging member; the second rotating boss member mounted for unitary rotation with the rotating shaft; the second annular fit disposed on a base-end side of the second connecting rod member and fitted about the outer edge of the second rotating boss member; and a second resilient member horizontally laid on a base-end side of the second massaging member, that the second resilient member is mounted so as to lie between the base-end sides of, respectively, the paired left-hand and right-hand second massaging members in the right-left direction, and that the spacing between the paired left-hand and right-hand second massaging members in the right-left direction is widened when the second resilient member is caused to contract by the second massaging members.

[0014] In the present invention, it is preferable that, when front ends of, respectively, the paired left-hand and right-hand second massaging members move away from each other, each of the second massaging members rotates about the front end of the second connecting rod member with consequent contraction of the second resilient member, thereby providing wider spacing between the paired left-hand and right-hand second massaging members in the right-left direction.

In the present invention, it is preferable that the driver includes a single drive motor, and the drive motor

drives the first massage unit and the second massage unit.

[0015] In the present invention, it is preferable that the first treatment target area is defined as a palm constituting a hand of a user, and the second treatment target area is defined as fingers constituting the hand of the user, and that the first resilient member and the second resilient member are each constructed of a spring member.

Advantageous Effects of Invention

[0016] The massager embodying the present invention performs massage treatment, including kneading massage and stretching, on user's hand held in a sandwiched state therein, can be used for hands of any size, and provides effective massage to users.

Brief Description of Drawings

[0017]

FIG. 1 is a perspective front view showing the general structural features of a massager embodying the present invention (first embodiment).

FIG. 2 is a perspective front view showing the internal configuration of the massager embodying the present invention.

FIG. 3 is a plan view showing the internal configuration of the massager embodying the present invention.

FIG. 4 is a side view showing a mode of using the massager embodying the present invention.

FIG. 5 is a rear view showing the rocking motion of the massager embodying the present invention.

FIG. 6 is an exploded view of a first message unit of the massager according to the first embodiment.

FIG. 7 is an exploded view of a second message unit of the massager according to the first embodiment.

FIG. 8 is a perspective front view showing the internal configuration of a massager embodying the present invention (second embodiment).

FIG. 9 is a plan view showing the internal configuration of the massager embodying the present invention.

FIG. 10 is a rear view showing the rocking motion of the massager embodying the present invention.

FIG. 11 is an exploded view of the first message unit of the massager according to the second embodiment.

FIG. 12 is an exploded view of the second message unit of the massager according to the second embodiment.

Description of Embodiments

[0018] Embodiments of a massager 1 pursuant to the present invention will now be described with reference to FIGs. 1 to 12, etc. The following embodiments are given by way of example of carrying out the present invention in

practice, and are therefore not intended to be limiting of the structural features of the present invention.

Moreover, some constituent components may be omitted from the drawings for clarity of illustration.

For directions and orientations indicated in the drawings for explanation of the massager, for example, a side of the massager 1 toward a user using the massager 1 with a hand H received in an insertion recess 2, or specifically a side provided with a switch unit 9, is defined as a front side corresponding to a forward direction, and a side of the massager 1 away from the user, or specifically a side provided with a line cord 10, is defined as a back side corresponding to a rear direction. Moreover, a right-left, or horizontal direction and a top-bottom, or vertical direction with respect to the massager 1 coincide with those as viewed from the user.

[0019] In the embodiments, a palm P of the hand H is referred to as a first treatment target area, and fingers F continuous with the palm P is referred to as a second treatment target area. Moreover, an elbow-to-hand (wrist) area is called a forearm A which is referred to as a third treatment target area (refer to FIG. 1).

[First Embodiment]

A first embodiment of the massager 1 pursuant to the present invention will now be described.

[0020] The general features and apparatus structure of the first embodiment of the massager 1 pursuant to the present invention are shown in FIGs. 1 to 7.

As shown in FIGs. 1 to 7, etc., for example, with the massager 1 (hand massager) embodying the present invention placed on a flat and stable surface such as a table, the user inserts the hand H into the insertion recess 3, and operates the massager 1 in a manner to perform kneading massage on the palm P (the first treatment target area) and the fingers F (the second treatment target area), and also perform stretching on the entire hand H.

[0021] The massager 1 according to this embodiment comprises: a case body 2 having the insertion recess 3; a first massage unit 4 configured to massage the palm P received in a sandwiched state in the insertion recess 3; a second massage unit 5 configured to massage the fingers F received in a sandwiched state in the insertion recess 3; and a driver 6 configured to drive the first massage unit 4 and the second massage unit 5.

The case body 2 has an interior space which is slightly larger than the hand H, or more specifically large enough to cover the hand H. That is, the case body 2 is shaped like a housing having an interior space elongated in a direction from front to rear of the massager (front-rear direction).

[0022] The case body 2 accommodates the first massage unit 4 configured to massage the palm P, the second massage unit 5 configured to massage the fingers F, the driver 6 configured to drive the first massage unit 4 and the second massage unit 5, a controller 7 configured to control the driver 6 and more.

 The case body 2 further accommodates a support (not shown in the drawings) for mounting the driver 6, etc. The case body 2 is provided at its bottom surface (lower surface) with legs 8 that allow the massager to be set on a table or the like with stability.

[0023] The case body 2 is open at the top, the front, and the rear to form the insertion recess 3 elongated in the front-rear direction. The insertion recess 3 is U-shaped when viewed from the front. The insertion recess 3 is dimensioned to be large enough for insertion of the hand H including the palm P (the first treatment target area) and the fingers F (the second treatment target area).

 The user inserts the hand H into the U-shaped insertion recess 3 from above, with the thumb up and the palm P facing in the horizontal direction.

[0024] The insertion recess 3 is internally provided with a lining (not shown) for covering the openings. The lining is preferably made of a cushion material which is pleasant to the feel for the hand H of the user. That is,

the cushion lining serves to moderately reduce the sandwiching strength of first massaging members and second massaging members in order to increase user's comfort. This enables the massager to apply practitioner (e.g. massage practitioner)'s massage-like massage to the hand H. Moreover, the lining keeps the hand H, etc. of the user clear of the apparatus interior to avoid that the user accidentally gets the hand H caught in the internal structure.

[0025] The case body 2 is provided at its front lower portion with a switch unit 9 for ON-OFF operation of the driver 6 and adjustment of massaging strength, and is also provided at its rear lower portion with a line cord 10 for power supply to the driver 6.

The configurations, etc. of the case body 2 and the insertion recess 3 are not limited to those as illustrated. The case body 2 may have any configuration that allows the massager to be supported on a table or the like with stability during massage operation, and the insertion recess 3 may have any configuration that permits easy and smooth insertion of the hand H. Moreover, although not shown in the drawings, the case body 2 may be internally provided with a fan heater configured to warm the hand H and help promote blood flow in the hand H for enhanced massage effect.

[0026] The first massage unit 4 is located toward the front side, whereas the second massage unit 5 is located toward the back side. That is, the first massage unit 4 and the second massage unit 5 are arranged in the front-rear direction.

 The first massage unit 4 comprises first massaging members 11, and first treatment elements 12 respectively attached to the first massaging members 11. The first massaging members 11 are rocked back and forth and from side to side with rolling motion, with the first treatment elements 12 applying pressing massage to the palm P sandwiched therebetween, and also stretching the palm P in the forward direction. The first massage unit 4 is disposed on the inner front side of the case body 2, and supported by a support.

[0027] As shown in FIGs. 1 to 7, etc., the first massage unit 4 forms a part that massages the palm P (the first treatment target area) received in a sandwiched state in the insertion recess 3. The first massage unit 4 comprises a pair of opposed left-hand and right-hand first massaging members 11 configured to massage the palm P sandwiched therebetween from both sides in the right-left direction.

 Each of the first massaging members 11 is an elongate member mounted so as to extend upward. In this embodiment,

the first massaging member 11 is shaped like a fan having a flat and widened upper portion.

[0028] The first massaging member 11 is provided at its base end (lower end) with a first annular fit 16 having an opening formed therethrough in the front-rear direction. The left-hand first massaging member 11a is formed with a first annular fit 16a located frontward.

The right-hand first massaging member 11b is formed with a first annular fit 16b located rearward. That is, the first annular fit 16a and the first annular fit 16b are arranged in a stacked manner in the front-rear direction.

[0029] The first massaging member 11 is provided at its front end (upper end) with the first treatment element 12 configured to apply pressing massage to the palm P (the first treatment target area).

The left-hand first massaging member 11a includes a first treatment element 12a facing rightward. The right-hand first massaging member 11b includes a first treatment element 12b facing leftward. That is, the first treatment element 12a and the first treatment element 12b are arranged facing each other for sandwiching the palm P in the right-left direction, and each press the sandwiched palm P in an outside to inside direction for pressing massage.

[0030] Moreover, the first massaging member 11 is

provided at its base end with a first joint 13. The left-hand first massaging member 11a is provided at its base end with a cylindrical projection 13a. The right-hand first massaging member 11b is provided at its base end with a cylindrical hole part 13b.

The projection 13a rotatably fits in the hole part 13b, thereby forming the first joint 13 to restrain the right-hand first massaging member 11b from rotating together with a rotating shaft 21. Note that the left-hand first massaging member 11a is restrained from rotating together with the rotating shaft 21 by a first rotation restrainer 17.

[0031] The first massage unit 4 is provided at its lower portion with a first converter 14 for rocking motion, being simply called a first rock converter 14. The first rock converter 14 converts the rotational driving force on the rotating shaft 21 into reciprocal rocking motion, and imparts rolling back-and-forth and side-to-side rocking motion to the paired left-hand and right-hand first massaging members 11. That is, the first rock converter 14 causes the paired left-hand and right-hand first massaging members 11 to move toward and away from each other in the right-left direction, and also to rock in the front-rear direction.

[0032] The first rock converter 14 comprises: a first

rotating boss member 15 fixedly attached to the rotating shaft 21 for eccentric rotation with respect to the rotating shaft 21; the first annular fit 16 disposed at the base end of the first massaging member 11 and fitted about the outer edge of the first rotating boss member 15; and the first rotation restrainer 17 configured to restrain the first massaging member 11 from rotating together with the rotating shaft 21.

The first rotating boss member 15 is a cylindrical member fitted onto the rotating shaft 21. The first rotating boss member 15 rotates concurrently with the rotation of the rotating shaft 21. The first rotating boss member 15 is provided at its outer periphery with a first cam surface 18 inclined with respect to the axis of the rotating shaft 21.

[0033] In this embodiment, as in the example illustrated in FIG. 4 for example, the first rotating boss member 15 is mounted so as to face forward and to the left with respect to the axis of the rotating shaft 21. The first cam surface 18 is mounted so as to face rearward and to the left with respect to the axis of the rotating shaft 21. Note that the first rotating boss member 15 changes orientation to a degree when rotated.

The first rotating boss member 15 is axially eccentric with respect to the axis of the rotating shaft

21, and, the first cam surface 18 is inclined. This arrangement permits inclined rotation and eccentric rotation of the first rotating boss member 15 relative to the rotation of the rotating shaft 21. The first annular fit 16 fits over the exterior of the inclined first cam surface 18.

[0034] This embodiment includes a first rotating boss member 15a situated forward of the left-hand first massaging member 11a, and a first rotating boss member 15b situated rearward of the right-hand first massaging member 11b.

The first annular fit 16 is formed at the base end of the first massaging member 11. The first annular fit 16 has an opening formed therethrough in the front-rear direction, and the opening has an inside diameter which is approximately equal to the outside diameter of the first rotating boss member 15 (the first cam surface 18).

[0035] The first annular fit 16, while facing in the front-rear direction, is oriented obliquely with respect to the axis of the rotating shaft 21, that is; oriented in the same direction as the first cam surface 18. In this embodiment, as in the example illustrated in FIG. 4 for example, the first annular fit 16 is, like the first rotating boss member 15, mounted so as to face forward and to the left with respect to the axis of the rotating shaft

21. Note that the first annular fit 16 changes orientation to a degree when rotated.

[0036] The first annular fit 16 fits, via a bearing, onto the first rotating boss member 15 in a condition to permit free relative rotation. The first annular fit 16 receives the rotating shaft 21 passed therethrough. The rotating shaft 21 has an axis directed in the front-rear direction.

 In this embodiment, the first annular fit 16a disposed at the base end of the left-hand first massaging member 11a fits onto the first rotating boss member 15a, and the first annular fit 16b disposed at the base end of the right-hand first massaging member 11b fits onto the first rotating boss member 15b.

[0037] The first rotating boss member 15 having the inclined first cam surface 18, and the first annular fit 16 fitted onto the first rotating boss member 15 convert the rotational driving force on the rotating shaft 21 into inclined rotation and eccentric rotation. This imparts reciprocal rocking motion (back-and-forth and side-to-side rocking motion, as seen in top plan view) to the first massaging members 11.

 The first rotation restrainer 17 restrains the first annular fit 16 from rotating together with the first rotating boss member 15. The first rotation restrainer 17

is located below the rotating shaft 21. The first rotation restrainer 17 comprises a downwardly facing restraining pin 19, and a restraining slot 20 in which the restraining pin 19 is slidably fitted.

[0038] The restraining pin 19 is shaped as a cylindrical projection, and protrudes downward from the base end of the left-hand first massaging member 11a, or specifically from the lower side of the first annular fit 16. The restraining slot 20 is shaped as a groove elongated in the front-rear direction, and located on the inner bottom of the case body 2. The restraining slot 20 is located underneath the confronting face of the restraining pin 19. The restraining slot 20 receives the restraining pin 19 which is inserted therein for sliding movement in the front-rear direction.

[0039] The rotating shaft 21 rotates under a rotational driving force outputted from the driver 6. The rotating shaft 21 is installed, with its axis directed in the front-rear direction, within the case body 2.

Specifically, the rotating shaft 21 has a forward end passed through the base end of the first massaging member 11, or specifically through the first annular fit 16. The rotating shaft 21 has a central portion in its lengthwise direction passed through the interior of a gear case 24 of the driver 6, and rotatably supported via a bearing 22.

Moreover, the rotating shaft 21 has a rear end passed through the base end of a second massaging member 25, or specifically through a second annular fit 30. On the right side of the rotating shaft 21, there is disposed the controller 7 configured to control the driver 6 and more.

[0040] The driver 6 drives the first massage unit 4 and the second massage unit 5 in a synchronized manner. The driver 6 is placed inside the case body 2. The driver 6 comprises a drive motor 23 configured to produce output of a rotational driving force, and a gear case 24 for deceleration to a predetermined rate in the rotational driving force. In this embodiment, the gear case 24 is molded integral with a case accommodating the drive motor 23.

[0041] The massager includes a single drive motor 23 to drive the first massage unit 4 and the second massage unit 5. The drive motor 23 is located below the rotating shaft 21, and mounted with its output shaft facing forward. The output shaft of the drive motor 23 is inserted into the gear case 24 located forward of the drive motor 23.

The gear case 24 houses a plurality of gears 24a, etc. for deceleration to a predetermined rate. With the gears 24a, the gear case 24 effects deceleration in the inputted rotational driving force from the output shaft of the drive motor 23, and delivers the rotational driving

force to the rotating shaft 21. That is, the drive motor 23 is connected via the gear case 24 to the rotating shaft 21.

[0042] The second massage unit 5 is situated rearward of the first massage unit 4. The second massage unit 5 comprises second massaging members 25, and second treatment elements 26 respectively attached to the second massaging members 25. The second massaging members 25 are rocked back and forth and from side to side with rolling motion, with the second treatment elements 26 applying pressing massage to the fingers F sandwiched therebetween, and stretching the fingers F in the forward direction. The second massage unit 5 is disposed on the inner rear side of the case body 2, and supported by a support.

[0043] As shown in FIGs. 1 to 7, etc., the second massage unit 5 forms a part that massages the fingers F (the second treatment target area) received in a sandwiched state in the insertion recess 3. The second massage unit 5 comprises a pair of opposed left-hand and right-hand second massaging members 25 configured to massage the fingers F sandwiched therebetween from both sides in the right-left direction.

In this embodiment, each of the second massaging members 25 is extended upwardly and bent forwardly. The second massaging member 25 is provided at its bent portion

with an elongate rod for mounting the second treatment element 26.

[0044] The second massaging member 25 is provided at its base end (lower end) with a second annular fit 30 having an opening formed therethrough in the front-rear direction. The left-hand second massaging member 25a is formed with a second annular fit 30a located rearward.

The right-hand second massaging member 25a is formed with a second annular fit 30b located frontward. That is, the second annular fit 30a and the second annular fit 30b are arranged in a stacked manner in the front-rear direction.

[0045] The second massaging member 25 is provided at its front end (upper end) with the second treatment element 26 configured to apply pressing massage to the fingers F (the second treatment target area). In this embodiment, the second treatment element 26 is shaped as a rotatable roller.

A plurality of vertically stacked second treatment elements 26 rotatably fit about the elongate rod extending upwardly from the bent portion of the second massaging member 25. That is, the second treatment elements 26 are shaped like Japanese rice dumplings on a skewer. The left-hand second treatment element 26a and the right-hand second treatment element 26b are arranged facing each other for

sandwiching the fingers F in the right-left direction, and each press the sandwiched fingers F in an outside to inside direction for pressing massage.

[0046] Moreover, the second massaging member 25 is provided at its base end with a second joint 27. The left-hand second massaging member 25a is provided at its base end with a cylindrical projection 27a. The right-hand second massaging member 25b is provided at its base end with a cylindrical hole part 27b.

The projection 27a rotatably fits in the hole part 27b, thereby forming the second joint 27 to restrain the right-hand second massaging member 25b from rotating together with the rotating shaft 21. Note that the left-hand second massaging member 25a is restrained from rotating together with the rotating shaft 21 by a second rotation restrainer 31.

[0047] The second massage unit 5 is provided at its lower portion with a second converter 28 for rocking motion, being simply called a second rock converter 28. The second rock converter 28 converts the rotational driving force on the rotating shaft 21 into reciprocal rocking motion, and imparts rolling back-and-forth and side-to-side rocking motion to the paired left-hand and right-hand second massaging members 25. That is, the second rock converter 28 causes the paired left-hand and

right-hand second massaging members 25 to move toward and away from each other in the right-left direction, and also to rock in the front-rear direction.

[0048] The second rock converter 28 comprises: a second rotating boss member 29 fixedly attached to the rotating shaft 21 for eccentric rotation with respect to the rotating shaft 21; the second annular fit 30 disposed at the base end of the second massaging member 25 and fitted about the outer edge of the second rotating boss member 29; and the second rotation restrainer 31 configured to restrain the second massaging member 25 from rotating together with the rotating shaft 21.

 The second rotating boss member 29 is a cylindrical member fitted onto the rotating shaft 21. The second rotating boss member 29 rotates concurrently with the rotation of the rotating shaft 21. The second rotating boss member 29 is provided at its outer periphery with a second cam surface 32 inclined with respect to the axis of the rotating shaft 21.

[0049] In this embodiment, as in the example illustrated in FIG. 4 for example, the second rotating boss member 29 is mounted so as to face forward and to the right with respect to the axis of the rotating shaft 21. The second cam surface 32 is mounted so as to face rearward and to the right with respect to the axis of the rotating shaft

21. Note that the second rotating boss member 29, while changing orientation to a degree when rotated, is oriented differently than is the first rotating boss member 15 during rotation.

[0050] The second cam surface 32 is inclined in a different direction from a direction axially of the rotating shaft 21. Moreover, the second cam surface 32 and the first cam surface 18 are inclined in different directions. That is, the second cam surface 32 and the first cam surface 18 are inclined in a truncated-inverted V-like form, that is; inclined in non-parallel relation, in top plan view.

The second rotating boss member 29 is axially eccentric with respect to the axis of the rotating shaft 21, and, the second cam surface 32 is inclined. This arrangement permits inclined rotation and eccentric rotation of the second rotating boss member 29 relative to the rotation of the rotating shaft 21. The second annular fit 30 fits over the exterior of the inclined second cam surface 32.

[0051] This embodiment includes a second rotating boss member 29a situated forward of the left-hand second massaging member 25a, and a second rotating boss member 29b situated rearward of the right-hand second massaging member 25b.

For example, as shown in FIG. 5, separating and overlapping movement of two white circles with black outline represent the path of rotational motion taken by the second rotating boss members 29a and 29b. Note that the first rotating boss members 15a and 15b follow a rotational path similar to the rotational path taken by the second rotating boss members 29a and 29b.

[0052] The second annular fit 30 is formed at the base end of the second massaging member 25. The second annular fit 30 has an opening formed therethrough in the front-rear direction, and the opening has an inside diameter which is approximately equal to the outside diameter of the second rotating boss member 29 (the second cam surface 32).

The second annular fit 30, while facing in the front-rear direction, is oriented obliquely with respect to the axis of the rotating shaft 21, that is; oriented in the same direction as the second cam surface 32. In this embodiment, as in the example illustrated in FIG. 4 for example, the second annular fit 30 is, like the second cam surface 32, mounted so as to face forward and to the right with respect to the axis of the rotating shaft 21. Note that the second annular fit 30, while changing orientation to a degree when rotated, is oriented differently than is the first annular fit 16 during rotation.

[0053] The second annular fit 30 is inclined in a

different direction from the axial direction of the rotating shaft 21. Moreover, the second annular fit 30 and the first annular fit 16 are inclined in different directions. That is, the second annular fit 30 and the first annular fit 16 are inclined in a truncated-inverted V-like form, that is; inclined in non-parallel relation, in top plan view.

The second annular fit 30 fits, via a bearing, onto the second rotating boss member 29 in a condition to permit free relative rotation. The second annular fit 30 receives the rotating shaft 21 passed therethrough. The axis of the rotating shaft 21 is directed in the front-rear direction.

[0054] In this embodiment, the second annular fit 30a disposed at the base end of the left-hand second massaging member 25a fits onto the second rotating boss member 29a, and the second annular fit 30b disposed at the base end of the right-hand second massaging member 25b fits onto the second rotating boss member 29b.

The second rotating boss member 29 having the inclined second cam surface 32, and the second annular fit 30 fitted onto the second rotating boss member 29 convert the rotational driving force on the rotating shaft 21 into inclined rotation and eccentric rotation. This imparts reciprocal rocking motion, namely back-and-forth and side-to-side rocking motion as seen in top plan view, to the

second massaging members 25.

[0055] The second rotation restrainer 31 restrains the second annular fit 30 from rotating together with the second rotating boss member 29. The second rotation restrainer 31 is located below the rotating shaft 21. The second rotation restrainer 31 comprises a downwardly facing restraining pin 33, and a restraining slot 34 in which the restraining pin 33 is slidably fitted.

 The restraining pin 33 is shaped as a cylindrical projection, and protrudes downward from the base end of the left-hand second massaging member 25a, or specifically from the lower side of the second annular fit 30. The restraining slot 34 is shaped as a groove elongated in the front-rear direction, and located on the inner bottom of the case body 2. The restraining slot 34 is located underneath the confronting face of the restraining pin 33. The restraining slot 34 receives the restraining pin 33 which is inserted therein for sliding movement in the front-rear direction.

[0056] The massager 1 according to this embodiment includes a shaft angle detector 35 configured to detect the angle of rotation of the rotating shaft 21, and the controller 7 configured to control drive operation of the first massage unit 4 and the second massage unit 5.

 The shaft angle detector 35 is disposed at the rear

end of the rotating shaft 21, and detects the angle of rotation of the rotating shaft 21. For example, a rotary encoder may be used for the shaft angle detector 35.

[0057] When the angle of rotation of the rotating shaft 21 reaches a predetermined level during the rocking motion of the paired left-hand and right-hand first massaging members 11 and the paired left-hand and right-hand second massaging members 25, the shaft angle detector 35 detects the positions of the massaging members.

The detected positions (the predetermined rotation angle) indicate that the paired left-hand and right-hand first massaging members 11 sandwich and hold the palm P (the first treatment target area) from both sides in the right-left direction, and the paired left-hand and right-hand second massaging members 25 sandwich and hold the fingers F (the second treatment target area) from both sides in the right-left direction.

[0058] In response to transmitted signals indicative of the detected positions, the controller 7 recognizes that the massaging members 11, as well as the massaging members 25, sandwich and hold the hand H, and then enables the massaging members 11 (25) to keep the hand H in a sandwiched state until the first massage unit 4 and the second massage unit 5 moving away from each other in the front-rear direction reach their respective predetermined

positions (positions farthest from each other). That is, the first massage unit 4 and the second massage unit 5 stretch the hand H in the front-rear direction.

[0059] When the first massage unit 4 and the second massage unit 5 moving away from each other in the front-rear direction reach their respective predetermined positions farthest from each other, then the controller 7 enables the massaging members 11 (25) to move away from each other for the release of the sandwiched hand H.

[Operation Mode]

The mode of operating the massager 1 embodying the present invention will now be described.

[0060] As shown in FIG. 1, with the massager 1 placed on a flat, stable and secure surface such as a table, the user inserts the hand H into the insertion recess 3 provided in the case body 2, and turns the power on by operating the switch unit 9 disposed on the front lower portion of the massager 1.

The driver 6 is driven on a command from the controller 7 in a manner such that the drive motor 23 produces output of a rotational driving force, and the output is transmitted via the gear case 24 to the rotating shaft 21.

[0061] With the rotation of the rotating shaft 21, the first rotating boss member 15 rotates and slides within the

first annular fit 16. That is, the rotational driving force on the rotating shaft 21 is converted into back-and-forth and side-to-side rocking motion by the first rock converter 14. The converting operation of the first rock converter 14 permits back-and-forth and side-to-side rocking motion of the first massaging member 11. The first massage unit 4, as being a single unit comprising the paired left-hand and right-hand first massaging members 11, rocks in the front-rear direction.

[0062] At the same time, with the rotation of the rotating shaft 21, the second rotating boss member 29 rotates and slides within the second annular fit 30. That is, the rotational driving force on the rotating shaft 21 is converted into back-and-forth and side-to-side rocking motion by the second rock converter 28. The converting operation of the second rock converter 28 permits back-and-forth and side-to-side rocking motion of the second massaging member 25.

The second massage unit 5, as being a single unit comprising the paired left-hand and right-hand second massaging members 25, rocks in the front-rear direction. That is, the first massage unit 4 and the second massage unit 5 move toward and away from each other in the front-rear direction.

[0063] The first rock converter 14 and the second rock

converter 28, while allowing synchronization of reciprocal rocking motion, perform conversion into rocking motion corresponding to a repeat of the mutual approaching-separating movement of the first massage unit 4 and the second massage unit 5 in the front-rear direction, and conversion into rocking motion corresponding to a repeat of the holding-releasing movement of the paired left-hand and right-hand first massaging members 11, as well as the holding-releasing movement of the paired left-hand and right-hand second massaging members 25, in the right-left direction.

As shown in FIG. 4, etc., in conditions where the first massage unit 4 and the second massage unit 5 hold in a sandwiching manner the palm P (the first treatment target area) and the fingers F (the second treatment target area), respectively, the first massage unit 4 and the second massage unit 5 are moved away from each other in the front-rear direction, thereby stretching the palm P and the fingers F (the hand H) in the front-rear direction.

[0064] Specifically, when the first massage unit 4 and the second massage unit 5 moving toward each other in the front-rear direction reach their respective predetermined positions, then the paired left-hand and right-hand first massaging members 11 move toward each other, and sandwich and hold the palm P (the first treatment target area) from

both sides in the right-left direction, and, the paired left-hand and right-hand second massaging members 25 move toward each other, and sandwich and hold the fingers F (the second treatment target area) from both sides in the right-left direction.

Then, the shaft angle detector 35 detects the predetermined rotation angle of the rotating shaft 21. In response to a transmitted detection signal, the controller 7 recognizes that the massaging members 11, as well as the massaging members 25, sandwich and hold the hand H (the palm P and the fingers F).

[0065] With the control of the controller 7, the first massage unit 4 and the second massage unit 5 moving away from each other in the front-rear direction keep the hand in a sandwiched state until they reach their respective predetermined positions, namely positions farthest from each other in the front-rear direction. That is, the first massage unit 4 and the second massage unit 5 operate to stretch the hand H in the front-rear direction.

When the first massage unit 4 and the second massage unit 5 moving away from each other in the front-rear direction reach their respective predetermined positions farthest from each other, then the shaft angle detector 35 detects the predetermined rotation angle of the rotating shaft 21. In response to a transmitted detection signal,

the controller 7 enables the paired left-hand and right-hand first massaging members 11 to move away from each other, and enables the paired left-hand and right-hand second massaging members 25 to move away from each other for the release of the sandwiched hand H.

[0066] In summary, for example, as indicated by arrowed lines in FIG. 3, with the first massage unit 4 and the second massage unit 5 positioned closest to each other in the front-rear direction, the paired left-hand and right-hand first massaging members 11 apply pressing massage to the palm P sandwiched therebetween, and the paired left-hand and right-hand second massaging members 25 apply pressing massage to the fingers F sandwiched therebetween.

The first massage unit 4 and the second massage unit 5 move away from each other in the front-rear direction while holding in a sandwiching manner the palm P and the fingers F, respectively, thereby stretching the hand H in the front-rear direction.

[0067] When the first massage unit 4 and the second massage unit 5 reach their respective positions farthest from each other, the paired left-hand and right-hand first massaging members 11 are moved away from each other to release the palm P, and the paired left-hand and right-hand second massaging members 25 are moved away from each other

to release the fingers F. The operation just described is repeated.

The massager 1 embodying the present invention performs kneading massage, stretching, etc. on the hand H of the user held in a sandwiched state therein, can be used for the hands H of any size, and provides effective massage to the user.

[0068] That is, the massager 1 embodying the present invention performs highly effective massage like hand massage treatment by a massage practitioner. The massager 1 performs, in addition to pressing massage, kneading massage and stretching simultaneously on the hand H (the palm P, the fingers F, etc.) by holding and stretching the hand H lengthwise.

[Second Embodiment]

A second embodiment of the massager 1 pursuant to the present invention will now be described.

[0069] The general features and apparatus structure of the second embodiment of the massager 1 pursuant to the present invention are shown in FIGs. 8 to 12.

Performance capabilities demanded of the massager 1 may include massage treatment on other area than those described above, such as the elbow-to-hand H (wrist) area, namely the forearm A (the third treatment target area).

[0070] The massager 1 according to the second

embodiment is designed for massage treatment on the forearm A (the third treatment target area) in addition to the palm P (the first treatment target area) and the fingers F (the second treatment target area) of the hand H. The following description of this embodiment deals with massage treatment on the forearm A by way of illustration. The massager 1 according to this embodiment is capable of massaging the palm P and the fingers F of the hand H as a matter of course.

The basic configuration of the massager 1 according to this embodiment is similar to that of the massager according to the first embodiment, and will thus not be described in detail.

[0071] That is, the constituent components, such as the first massage unit 4, the second massage unit 5, the driver 6, the first massaging member 11, the first rock converter 14, the rotating shaft 21, the second massaging member 25, the second rock converter 28, and the shaft angle detector 35, of the second embodiment are similar in basic configuration to those of the first embodiment.

The second embodiment differs from the first embodiment in that the spacing between the paired left-hand and right-hand first massaging members 11 in the right-left direction, as well as the spacing between the paired left-hand and right-hand second massaging members 25 in the

right-left direction, can be widened. This permits insertion of the larger-than-hand H forearm A into the first massage unit 4 and into the second massage unit 5.

[0072] As shown in FIGs. 8 to 12, in this embodiment, the first rock converter 14 comprises: a first rotating boss member 15 mounted for unitary rotation with the rotating shaft 21; and a first annular fit 16 fitted about the outer edge of the first rotating boss member 15.

This embodiment further includes a first connecting rod member 36 facing horizontally and outwardly with respect to the rotating shaft 21. The first connecting rod member 36 has a front end coupled to a lengthwise intermediate location of the first massaging member 11.

[0073] The first massaging member 11 of this embodiment differs in configuration from the first massaging member of the first embodiment. That is, in this embodiment, the first massaging member 11 is an elongate member mounted so as to extend upward. The first massaging member 11 is shaped like a fan having a flat and widened upper portion. The first massaging member 11 is provided at its front end (upper end) with a first treatment element 12 configured to apply pressing massage to the forearm A (the third treatment target area), for example.

[0074] The first massaging member 11 is provided at its base end (lower end) with a hole part 38 in which is

fitted a pin member 37 having a rotatably supporting function. That is, in this embodiment, the base end (lower end) of the first massaging member 11 is not provided with the first annular fit 16.

The first massaging member 11 is provided at its lengthwise intermediate location with a hole part 40 in which is fitted a pin member 39 having a rotatably supporting function.

[0075] In this embodiment, between the first massaging member 11 and the first rotating boss member 15 is located the first connecting rod member 36. The first connecting rod member 36 is mounted with its front end facing horizontally and outwardly. The first connecting rod member 36 is provided at its front end with a hole part 41 in which is fitted the pin member 39 having a rotatably supporting function.

The first connecting rod member 36 is provided at its base-end side with the first annular fit 16. That is, the first connecting rod member 36 is tapered from the base end to the front end thereof.

[0076] This embodiment includes two first connecting rod members 36 arranged in the front-rear direction.

One first connecting rod member 36a located to the left is situated rearward of the first rotating boss member 15a. The first connecting rod member 36a has a hole part

41a which is communicated in alignment with a hole part 40a formed in a lengthwise intermediate location of the left-hand first massaging member 11a. With the pin member 39 inserted in the aligned hole parts 41a and 40a, the first connecting rod member 36a rotatably supports the left-hand first massaging member 11a.

[0077] The first connecting rod member 36a is provided at its base end with a first annular fit 16a fitted onto the first rotating boss member 15a.

The other first connecting rod member 36b located to the right is situated forward of the first rotating boss member 15b. The first connecting rod member 36b has a hole part 41b which is communicated in alignment with a hole part 40b formed in a lengthwise intermediate location of the right-hand first massaging member 11b. With the pin member 39 inserted in the aligned hole parts 41b and 40b, the first connecting rod member 36b rotatably supports the right-hand first massaging member 11b.

[0078] The first connecting rod member 36b is provided at its base end with a first annular fit 16b fitted onto the first rotating boss member 15b.

The first rotating boss member 15 of this embodiment differs in configuration from the first rotating boss member of the first embodiment. That is, in this embodiment, the first rotating boss members 15a and 15b are

molded integral with each other. The first rotating boss members 15a and 15b are axially eccentric with respect to the axis of the rotating shaft 21. A first cam surface 18a formed in the first rotating boss member 15a and a first cam surface 18b formed in the first rotating boss member 15b are inclined in the same direction.

[0079] In this embodiment, as in the example illustrated in FIG. 9 for example, the first rotating boss members 15a and 15b are mounted so as to face forward and to the left with respect to the axis of the rotating shaft 21. The first cam surfaces 18a and 18b are mounted so as to face rearward and to the left with respect to the axis of the rotating shaft 21.

The first rotating boss members 15a and 15b make inclined rotation and eccentric rotation relative to the rotation of the rotating shaft 21.

[0080] In this embodiment, the first rotating boss member 15a is situated forward of the left-hand first connecting rod member 36a. The first rotating boss member 15b is situated rearward of the right-hand first connecting rod member 36b.

The first rotating boss member 15 has a centrally located flange 44 fitted in a hole part 43 of a support member 42. That is, the first rotating boss member 15 is rotatably supported by the support member 42.

[0081] This embodiment includes the support member 42, through which the rotating shaft 21 is passed, configured to support the first rotating boss member 15. The support member 42 is shaped as a plate having an upper portion formed with the hole part 43. The hole part 43 has a fit on the exterior of the flange 44 of the first rotating boss member 15. The support member 42 rotatably supports the paired left-hand and right-hand first massaging members 11 at their base ends.

The support member 42 has a lower portion formed with a slot part 45 elongated in the right-left direction. An approximately rectangular-shaped block material 46 is disposed in the slot part 45. The block material 46 is formed with a hole part 47 in which the pin member 37 is fitted. There is provided a pair of left-hand and right-hand block materials 46.

[0082] The left-hand block material 46a has a hole part 47a which is communicated in alignment with a hole part 38a formed in the left-hand first massaging member 11a. With the pin member 37 inserted in the aligned hole parts 47a and 38a, the left-hand block material 46a rotatably supports the lower end of the left-hand first massaging member 11a.

The right-hand block material 46b has a hole part 47b which is communicated in alignment with a hole part 38b

formed in the right-hand first massaging member 11b. With the pin member 37 inserted in the aligned hole parts 47b and 38b, the right-hand block material 46b rotatably supports the lower end of the right-hand first massaging member 11b.

[0083] In this embodiment, the outer side of the block material 46 in the right-left direction is substantially rounded in order to release an inertial force resulting from the rocking motion of the first massaging member 11.

The first annular fit 16 of this embodiment is disposed in a different position from the first annular fit of the first embodiment. That is, the first annular fit 16 is disposed at the base end of the first connecting rod member 36. The first annular fit 16a is situated rearward of the first rotating boss member 15a. The first annular fit 16b is situated forward of the first rotating boss member 15b.

[0084] In this embodiment, as in the example illustrated in FIG. 9 for example, the first annular fits 16a and 16b are, like the first rotating boss member 15, mounted so as to face forward and to the left with respect to the axis of the rotating shaft 21.

In this embodiment, the first annular fit 16a disposed at the base end of the left-hand first connecting rod member 36a fits onto the first rotating boss member

15a. Moreover, the first annular fit 16a is held in sandwich style by a pusher member 15c.

[0085] The first annular fit 16b disposed at the base end of the right-hand first connecting rod member 36b fits onto the first rotating boss member 15b. Moreover, the first annular fit 16b is held in sandwich style by a pusher member 15d.

The first rotating boss member 15 having the inclined first cam surface 18, and the first annular fit 16 fitted onto the first rotating boss member 15 convert the rotational driving force on the rotating shaft 21 into inclined rotation and eccentric rotation. This imparts reciprocal rocking motion, namely back-and-forth and side-to-side rocking motion as seen in top plan view, to the first massaging members 11.

[0086] This embodiment further includes a first resilient member 48 horizontally laid on the base-end side of the first massaging member 11. In this embodiment, a spring member (coil spring) is used for the first resilient member 48.

The first spring member 48 is mounted so as to lie between the base-end sides of, respectively, the paired left-hand and right-hand first massaging members 11 in the right-left direction. Specifically, the first spring member 48 is disposed at the lower portion of the support

member 42. The first spring member 48 is laid in the right-left direction, that is; horizontally laid, within the horizontally elongated slot part 45 formed in the lower portion of the support member 42. More specifically, the first spring member 48 is interposed between the left-hand block material 46a and the right-hand block material 46b disposed within the elongate slot part 45.

[0087] That is, the outward movement of each of the paired left-hand and right-hand first massaging members 11a and 11b in the right-left direction causes contraction of the first spring member 48 located on the base-end sides of the first massaging members, thereby widening the spacing between the paired left-hand and right-hand first massaging members 11 in the right-left direction.

Specifically, when the front ends of, respectively, the paired left-hand and right-hand first massaging members 11a and 11b move away from each other, or specifically each move outward in the right-left direction, the left-hand first massaging member 11a rotates about the front end of the first connecting rod member 36a, and the right-hand first massaging member 11b rotates about the front end of the first connecting rod member 36b, thereby causing contraction of the horizontally laid first spring member 48. This provides wider spacing between the paired left-hand and right-hand first massaging members 11a and 11b in

the right-left direction enough for insertion of the forearm A (the third treatment target area) which is larger than the palm P (the first treatment target area) and the fingers F (the second treatment target area) of the hand H.

[0088] The stiffness (spring constant), etc. of the first spring member 48 are suitably determined with consideration given to the comfort of the inserted treatment target area.

 This embodiment includes a first rotation restrainer 17 disposed at the lower portion of the support member 42. The first rotation restrainer 17 restrains, via the support member 42, the first annular fit 16 from rotating together with the first rotating boss member 15. The first rotation restrainer 17 comprises: a downwardly facing restraining pin 19 extending from the lower side of the slot part 45; and a restraining slot, located on the inner bottom of the case body 2, in which the restraining pin 19 is slidably fitted.

[0089] In this embodiment, above the first rock converter 14, there is disposed a cover member 62 for the prevention of entry of the treatment target area received in the insertion recess 3.

 As shown in FIGs. 8 to 12, in this embodiment, the second rock converter 28 comprises: a second rotating boss member 29 mounted for unitary rotation with the rotating

shaft 21; and a second annular fit 30 fitted about the outer edge of the second rotating boss member 29.

[0090] This embodiment further includes a second connecting rod member 49 facing horizontally and outwardly with respect to the rotating shaft 21. The second connecting rod member 49 has a front end coupled to a lengthwise intermediate location of the second massaging member 25.

The second massaging member 25 of this embodiment differs in configuration from the second massaging member of the first embodiment. That is, in this embodiment, the second massaging member 25 is an elongate member mounted so as to extend upward. The second massaging member 25 is shaped like a fan having a flat and widened upper portion. The second massaging member 25 is provided at its front end (upper end) with a second treatment element 26 configured to apply pressing massage to the forearm A (the third treatment target area), for example.

[0091] The second massaging member 25 is provided at its base end (lower end) with a hole part 51 in which is fitted a pin member 50 having a rotatably supporting function. Moreover, the second massaging member 25 is provided at its lengthwise intermediate location with a hole part 53 in which is fitted a pin member 52 having a rotatably supporting function.

In this embodiment, between the second massaging member 25 and the second rotating boss member 29 is located the second connecting rod member 49. The second connecting rod member 49 is mounted with its front end facing horizontally and outwardly. The second connecting rod member 49 is provided at its front end with a hole part 54 in which is fitted the pin member 52 having a rotatably supporting function.

[0092] The second connecting rod member 49 is provided at its base end with the second annular fit 30. That is, the second connecting rod member 49 is tapered from the base end to the front end thereof.

This embodiment includes two second connecting rod members 49 arranged in the front-rear direction.

One second connecting rod member 49a located to the left is situated forward of the first rotating boss member 15a. The second connecting rod member 49a has a hole part 54a which is communicated in alignment with a hole part 53a formed in a lengthwise intermediate location of the left-hand first massaging member 11a. With the pin member 52 inserted in the aligned hole parts 54a and 53a, the second connecting rod member 49a rotatably supports the left-hand first massaging member 11a.

[0093] The second connecting rod member 49a is provided at its base end with a second annular fit 30a

fitted onto the second rotating boss member 29a.

The other second connecting rod member 49b located to the right is situated rearward of the second rotating boss member 29b. The second connecting rod member 49b has a hole part 54b which is communicated in alignment with a hole part 53b formed in a lengthwise intermediate location of the right-hand first massaging member 11b. With the pin member 52 inserted in the aligned hole parts 54b and 53b, the second connecting rod member 49b rotatably supports the right-hand first massaging member 11b.

[0094] The second annular fit 30b disposed at the base end of the second connecting rod member 49b fits onto the second rotating boss member 29b.

The second rotating boss member 29 of this embodiment differs in configuration from the second rotating boss member of the first embodiment. That is, in this embodiment, the second rotating boss members 29a and 29b are molded integral with each other. The second rotating boss members 29a and 29b are axially eccentric with respect to the axis of the rotating shaft 21. A second cam surface 32a formed in the second rotating boss member 29a and a second cam surface 32b formed in the second rotating boss member 29b are inclined in the same direction.

[0095] In this embodiment, as in the example illustrated in FIG. 9 for example, the second rotating boss

members 29a and 29b are mounted so as to face forward and to the right with respect to the axis of the rotating shaft 21. The second cam surfaces 32a and 32b are mounted so as to face rearward and to the right with respect to the axis of the rotating shaft 21.

The second rotating boss members 29a and 29b make inclined rotation and eccentric rotation relative to the rotation of the rotating shaft 21.

[0096] In this embodiment, the second rotating boss member 29a is situated rearward of the left-hand second connecting rod member 49a. The second rotating boss member 29b is situated forward of the right-hand second connecting rod member 49b.

The second rotating boss member 29 has a centrally located flange 57 fitted in a hole part 56 of a support member 55. That is, the second rotating boss member 29 is rotatably supported by the support member 55.

[0097] This embodiment includes the support member 55, through which the rotating shaft 21 is passed, configured to support the second rotating boss member 29. The support member 55 is shaped as a plate having an upper portion formed with the hole part 56. The hole part 56 has a fit on the exterior of the flange 57 of the second rotating boss member 29. The support member 55 rotatably supports the paired left-hand and right-hand second massaging

members 25 at their base ends.

The support member 55 has a lower portion formed with a slot part 58 elongated in the right-left direction. An approximately rectangular-shaped block material 59 is disposed in the slot part 58. The block material 59 is formed with a hole part 60 in which the pin member 50 is fitted. There is provided a pair of left-hand and right-hand block materials 59.

[0098] The left-hand block material 59a has a hole part 60a which is communicated in alignment with a hole part 51a formed in the left-hand second massaging member 25a. With the pin member 50 inserted in the aligned hole parts 60a and 51a, the left-hand block material 59a rotatably supports the lower end of the left-hand second massaging member 25a.

The right-hand block material 59b has a hole part 60b which is communicated in alignment with a hole part 51b formed in the right-hand second massaging member 25b. With the pin member 50 inserted in the aligned hole parts 60b and 51b, the right-hand block material 59b rotatably supports the lower end of the right-hand second massaging member 25b.

[0099] In this embodiment, the outer side of the block material 59 in the right-left direction is substantially rounded in order to release an inertial force resulting

from the rocking motion of the second massaging member 25.

The second annular fit 30 of this embodiment is disposed in a different position from the second annular fit of the first embodiment. That is, the second annular fit 30 is disposed at the base end of the second connecting rod member 49. The second annular fit 30a is situated forward of the second rotating boss member 29a. The second annular fit 30b is situated rearward of the second rotating boss member 29b.

[0100] In this embodiment, as in the example illustrated in FIG. 9 for example, the second annular fits 30a and 30b are, like the second rotating boss member 29, mounted so as to face forward and to the right with respect to the axis of the rotating shaft 21.

In this embodiment, the second annular fit 30a disposed at the base end of the left-hand second connecting rod member 49a fits onto the second rotating boss member 29a. Moreover, the second annular fit 30a is held in sandwich style by a pusher member 29c.

[0101] The second annular fit 30b disposed at the base end of the right-hand second connecting rod member 49b fits onto the second rotating boss member 29b. Moreover, the second annular fit 30b is held in sandwich style by a pusher member 29d.

The second rotating boss member 29 having the

inclined second cam surface 32, and the second annular fit 30 fitted onto the second rotating boss member 29 convert the rotational driving force on the rotating shaft 21 into inclined rotation and eccentric rotation. This imparts reciprocal rocking motion, namely back-and-forth and side-to-side rocking motion as seen in top plan view, to the second massaging members 25.

[0102] This embodiment further includes a second resilient member 61 horizontally laid on the base-end side of the second massaging member 25. In this embodiment, a spring member (coil spring) is used for the second resilient member 61.

The second spring member 61 is mounted so as to lie between the base-end sides of, respectively, the paired left-hand and right-hand second massaging members 25 in the right-left direction. Specifically, the second spring member 61 is disposed at the lower portion of the support member 55. The second spring member 61 is laid in the right-left direction, that is; horizontally laid, within the horizontally elongated slot part 58 formed in the lower portion of the support member 55. More specifically, the second spring member 61 is interposed between the left-hand block material 59a and the right-hand block material 59b disposed within the elongate slot part 58.

[0103] That is, the outward movement of each of the

paired left-hand and right-hand second massaging members 25a and 25b in the right-left direction causes contraction of the second spring member 61 located on the base-end sides of the second massaging members, thereby widening the spacing between the paired left-hand and right-hand second massaging members 25 in the right-left direction.

Specifically, when the front ends of, respectively, the paired left-hand and right-hand second massaging members 25a and 25b move away from each other, or specifically each move outward in the right-left direction, the left-hand second massaging member 25a rotates about the front end of the second connecting rod member 49a, and the right-hand second massaging member 25b rotates about the front end of the second connecting rod member 49b, thereby causing contraction of the horizontally laid second spring member 61. This provides wider spacing between the paired left-hand and right-hand second massaging members 25a and 25b in the right-left direction enough for insertion of the forearm A (the third treatment target area) which is larger than the palm P (the first treatment target area) and the fingers F (the second treatment target area) of the hand H.

[0104] The stiffness (spring constant), etc. of the second spring member 61 are suitably determined with consideration given to the comfort of the inserted treatment target area.

This embodiment includes a second rotation restrainer 31 disposed at the lower portion of the support member 55. The second rotation restrainer 31 restrains, via the support member 55, the second annular fit 30 from rotating together with the second rotating boss member 29. The second rotation restrainer 31 comprises: a downwardly facing restraining pin 33 extending from the lower side of the slot part 58; and a restraining slot, located on the inner bottom of the case body 2, in which the restraining pin 33 is slidably fitted.

[0105] In this embodiment, above the second rock converter 28, there is disposed a cover member 62 for the prevention of entry of the treatment target area received in the insertion recess 3.

[Operation Mode]

The mode of operating the massager 1 embodying the present invention will now be described.

As shown in FIG. 1, with the massager 1 placed on a flat, stable and secure surface such as a table, the user inserts the forearm A (the third treatment target area) into the insertion recess 3 provided in the case body 2.

[0106] Specifically, the user pushes the forearm A into the insertion recess 3 from above. The pushing-in of the forearm A causes the front-end side of each of the paired left-hand and right-hand first massaging members 11a

and 11b to move outward in the right-left direction.

That is, the left-hand first massaging member 11a rotates about the front end of the first connecting rod member 36a, or specifically about the pin member 39, and the right-hand first massaging member 11b rotates about the front end of the first connecting rod member 36b, or specifically about the pin member 39. This causes the horizontally laid first spring member 48 to contract, thereby moving the left-hand block material 46a rightward, and moving the right-hand block material 46b leftward, the left-hand and right-hand block materials 46a and 46b being disposed within the elongate slot part 45 formed in the support member 42.

[0107] On the base-end side of the first massaging member 11, the first spring member 48 interposed between the left-hand block material 46a and the right-hand block material 46b contracts under compression by the block materials 46a and 46b, thereby providing wider spacing between the paired left-hand and right-hand first massaging members 11a and 11b in the right-left direction enough for insertion of the forearm A.

Likewise, the pushing-in of the forearm A causes the front-end side of each of the paired left-hand and right-hand second massaging members 25a and 25b to move outward in the right-left direction.

[0108] That is, the left-hand second massaging member 25a rotates about the front end of the second connecting rod member 49a, or specifically about the pin member 52, and the right-hand second massaging member 25b rotates about the front end of the first connecting rod member 49b, or specifically about the pin member 52. This causes the horizontally laid second spring member 61 to contract, thereby moving the left-hand block material 59a rightward, and moving the right-hand block material 59b leftward, the left-hand and right-hand block materials 59a and 59b being disposed within the elongate slot part 58 formed in the support member 55.

[0109] On the base-end side of the second massaging member 25, the second spring member 61 interposed between the left-hand block material 59a and the right-hand block material 59b contracts under compression by the block materials 59a and 59b, thereby providing wider spacing between the paired left-hand and right-hand second massaging members 25a and 25b in the right-left direction enough for insertion of the forearm A.

That is, the pushing-in of the forearm A causes the paired left-hand and right-hand first massaging members 11a and 11b, and the paired left-hand and right-hand second massaging members 25a and 25b to sufficiently move outward in the right-left direction simultaneously.

[0110] The user turns the power on by operating the switch unit 9 disposed on the front lower portion of the massager 1. The driver 6 is then driven on a command from the controller 7 in a manner such that the drive motor 23 produces output of a rotational driving force, and the output is transmitted via the gear case 24 to the rotating shaft 21.

 With the rotation of the rotating shaft 21, the first rotating boss member 15 rotates and slides within the first annular fit 16. The first connecting rod member 36 transmits reciprocal rocking motion resulting from the conversion to the first massaging member 11.

[0111] That is, the rotational driving force on the rotating shaft 21 is converted into back-and-forth and side-to-side rocking motion by the first rock converter 14. The converting operation of the first rock converter 14 enables the first massaging member 11 to rock back and forth and from side to side via the first connecting rod member 36. The first massage unit 4 is rocked in the front-rear direction.

 At the same time, with the rotation of the rotating shaft 21, the second rotating boss member 29 rotates and slides within the second annular fit 30. The second connecting rod member 49 transmits reciprocal rocking motion resulting from the conversion to the second

massaging member 25.

[0112] That is, the rotational driving force on the rotating shaft 21 is converted into back-and-forth and side-to-side rocking motion by the second rock converter 28. The converting operation of the second rock converter 28 enables the second massaging member 25 to rock back and forth and from side to side via the second connecting rod member 49.

The second massage unit 5 is rocked in the front-rear direction. That is, the first massage unit 4 and the second massage unit 5 are moved toward and away from each other in the front-rear direction.

[0113] The first rock converter 14 and the second rock converter 28, while allowing synchronization of reciprocal rocking motion, perform conversion into rocking motion corresponding to a repeat of the mutual approaching-separating movement of the first massage unit 4 and the second massage unit 5 in the front-rear direction, and conversion into rocking motion corresponding to a repeat of the holding-releasing movement of the paired left-hand and right-hand first massaging members 11, as well as the holding-releasing movement of the paired left-hand and right-hand second massaging members 25, in the right-left direction.

As shown in FIG. 9 for example, in conditions where

the first massage unit 4 and the second massage unit 5 hold in a sandwiching manner the elbow-side area of the forearm A and the wrist-side area of the forearm A, respectively, the first massage unit 4 and the second massage unit 5 are moved away from each other in the front-rear direction, thereby stretching the entire forearm A in the front-rear direction.

[0114] Specifically, when the first massage unit 4 and the second massage unit 5 moving toward each other in the front-rear direction reach their respective predetermined positions, then the paired left-hand and right-hand first massaging members 11 move toward each other, and sandwich and hold the elbow-side area of the forearm A from both sides in the right-left direction, and, the paired left-hand and right-hand second massaging members 25 move toward each other, and sandwich and hold the wrist-side area of the forearm A from both sides in the right-left direction.

Then, the shaft angle detector 35 detects the predetermined rotation angle of the rotating shaft 21. In response to a transmitted detection signal, the controller 7 recognizes that the massaging members 11, as well as the massaging members 25, sandwich and hold the entire forearm A.

[0115] With the control of the controller 7, the first massage unit 4 and the second massage unit 5 moving away

from each other in the front-rear direction keep the forearm in a sandwiched state until they reach their respective predetermined positions, namely positions farthest from each other in the front-rear direction. That is, the first massage unit 4 and the second massage unit 5 operate to stretch the entire forearm A in the front-rear direction.

When the first massage unit 4 and the second massage unit 5 moving away from each other in the front-rear direction reach their respective predetermined positions farthest from each other, then the shaft angle detector 35 detects the predetermined rotation angle of the rotating shaft 21. In response to a transmitted detection signal, the controller 7 enables the paired left-hand and right-hand first massaging members 11 to move away from each other, and enables the paired left-hand and right-hand second massaging members 25 to move away from each other for the release of the sandwiched forearm A.

[0116] In summary, for example, as indicated by arrowed lines in FIG. 9, with the first massage unit 4 and the second massage unit 5 positioned closest to each other in the front-rear direction, the paired left-hand and right-hand first massaging members 11 apply pressing massage to the elbow-side area of the forearm A sandwiched therebetween, and the paired left-hand and right-hand

second massaging members 25 apply pressing massge to the wrist-side area of the forearm A sandwiched therebetween.

[0117] The first massge unit 4 and the second massge unit 5 move from each other in the front-rear direction while holding in a sandwiching manner the forearm A, thereby stretching the entire forearm A in the front-rear direction.

When the first massge unit 4 and the second massge unit 5 are positioned farthest from each other, the paired left-hand and right-hand first massaging members 11 are moved away from each other to release the elbow-side area of the forearm A, and the paired left-hand and right-hand second massaging members 25 are moved away from each other to release the wrist-side area of the forearm A. The operation just described is repeated.

[0118] The massager 1 embodying the present invention performs kneading massge, stretching, etc. on the forearm A of the user held in a sandwiched state therein, can be used for the forearms A (the hands H) of any size, and provides effective massge to the user.

That is, the massager 1 embodying the present invention performs highly effective massge like hand massge treatment by a massge practitioner. The massager 1 is capable of massaging, in addition to the hand H (the palm P and the fingers F, etc.), the forearm A by widening

the spacing between the paired left-hand and right-hand first massaging members 11 and the spacing between the paired left-hand and right-hand second massaging members 25. Thus, the massager 1 performs not only pressing massage but also kneading massage and stretching on both the hand H and the forearm A by holding and stretching the hand H and the forearm A lengthwise.

[0119] It should be understood that the embodiments as disclosed herein are considered in all respects as illustrative only and not restrictive.

In particular, for such matters as not explicitly specified in the disclosure of the embodiments, e.g. working conditions, operating conditions, and the dimensions, weights, etc. of the structural components, those that do not depart from the practical range to be normally complied with by persons skilled in the art and that conform to matters of common knowledge among the skilled persons are adopted herein.

[0120] For example, the length of the first massaging member 11 provided in the first massage unit 4, the inclination angle and the eccentric position of the first massaging member 11 (the first cam surface 18 of the first rotating boss member 15) with respect to the rotating shaft 21, and the spaced interval between the left-hand and right-hand first massaging members 11 may be suitably

changed as required in accordance with the range of massage treatment, or specifically the sizes of the hand H, such as the palm P, and the forearm A, for example.

Likewise, the length of the second massaging member 25 provided in the second massage unit 5, the inclination angle and the eccentric position of the second massaging member 25 (the second cam surface 32 of the second rotating boss member 29) with respect to the rotating shaft 21, and the spaced interval between the left-hand and right-hand second massaging members 25 may be suitably changed as required in accordance with the range of massage treatment, or specifically the sizes of the hand H, such as the fingers F, and the forearm A, for example.

Reference Signs List

[0121]

- | | |
|----|---------------------|
| 1 | Massager |
| 2 | Case body |
| 3 | Insertion recess |
| 4 | First massage unit |
| 5 | Second massage unit |
| 6 | Driver |
| 7 | Controller |
| 8 | Leg |
| 9 | Switch unit |
| 10 | Line cord |

- 11 First massaging member
- 11a Left-hand first massaging member
- 11b Right-hand first massaging member
- 12 First treatment element
- 12a Left-hand first treatment element
- 12b Right-hand first treatment element
- 13 First joint
- 13a Projection
- 13b Hole part
- 14 First rock converter
- 15 First rotating boss member
- 15a First rotating boss member
- 15b First rotating boss member
- 15c Pusher member
- 15d Pusher member
- 16 First annular fit
- 16a First annular fit
- 16b First annular fit
- 17 First rotation restrainer
- 18 First cam surface
- 19 Restraining pin
- 20 Restraining slot
- 21 Rotating shaft
- 22 Bearing
- 23 Drive motor

- 24 Gear case
- 25 Second massaging member
- 25a Left-hand second massaging member
- 25b Right-hand second massaging member
- 26 Second treatment element
- 26a Left-hand second treatment element
- 26b Right-hand second treatment element
- 27 Second joint
- 27a Projection
- 27b Hole part
- 28 Second rock converter
- 29 Second rotating boss member
- 29a Second rotating boss member
- 29b Second rotating boss member
- 29c Pusher member
- 29d Pusher member
- 30 Second annular fit
- 31 Second rotation restrainer
- 32 Second cam surface
- 33 Restraining pin
- 34 Restraining slot
- 35 Shaft angle detector
- 36 First connecting rod member
- 37 Pin member
- 38 Hole part (formed in the base end (lower end) of the

first massaging member)

38a Left-hand hole part

38b Right-hand hole part

39 Pin member

40 Hole part (formed in the lengthwise intermediate location of the first massaging member)

40a Left-hand hole part

40b Right-hand hole part

41 Hole part (formed in the front end of the first connecting rod member)

41a Left-hand hole part

41b Right-hand hole part

42 Support member

43 Hole part (formed in the support member)

44 Flange

45 Slot part

46 Block material

46a Left-hand block material

46b Right-hand block material

47 Hole part

47a Left-hand hole part

47b Right-hand hole part

48 First resilient member (spring member)

49 Second connecting rod member

50 Pin member

- 51 Hole part (formed in the base end (lower end) of the second massaging member)
- 51a Left-hand hole part
- 51b Right-hand hole part
- 52 Pin member
- 53 Hole part (formed in the lengthwise intermediate location of the second massaging member)
- 53a Left-hand hole part
- 53b Right-hand hole part
- 54 Hole part (formed in the front end of the second connecting rod member)
- 54a Left-hand hole part
- 54b Right-hand hole part
- 55 Support member
- 56 Hole part
- 57 flange
- 58 Slot part
- 59 Block material
- 59a Left-hand block material
- 59b Right-hand block material
- 60 Hole part
- 60a Left-hand hole part
- 60b Right-hand hole part
- 61 Second resilient member (spring member)
- 62 Cover member

H	Hand
P	Palm (First treatment target area)
F	Fingers (Second treatment target area)
A	Forearm (Third treatment target area)

CLAIMS

1. A massager, comprising:

an insertion recess into which a first treatment target area and a second treatment target area continuous with the first treatment target area can be inserted;

a first massage unit to massage the first treatment target area received in a sandwiched state in the insertion recess;

a second massage unit to massage the second treatment target area received in a sandwiched state in the insertion recess; and

a driver to drive the first massage unit and the second massage unit,

the first massage unit being located toward a front side of the massager,

the second massage unit being located toward a back side of the massager,

the first massage unit and the second massage unit being movable toward and away from each other in a front-rear direction.

2. The massager according to claim 1, wherein

in conditions where the first massage unit and the second massage unit hold in a sandwiching manner the first

treatment target area and the second treatment target area, respectively, the first massage unit and the second massage unit are moved away from each other in the front-rear direction, thereby stretching the first treatment target area and second treatment target area.

3. The massager according to claim 1 or claim 2, wherein the first massage unit includes a pair of opposed left-hand and right-hand first massaging members to massage the first treatment target area sandwiched therebetween from both sides in a right-left direction, and

the second massage unit includes a pair of opposed left-hand and right-hand second massaging members to massage the second treatment target area sandwiched therebetween from both sides in the right-left direction, and wherein

the massager repeats following operation:

when the first massage unit and the second massage unit moving toward each other in the front-rear direction reach their respective predetermined positions, then the paired left-hand and right-hand first massaging members move toward each other, and the paired left-hand and right-hand second massaging members move toward each other, and

when the first massage unit and the second massage unit moving away from each other in the front-rear

direction reach their respective predetermined positions, then the paired left-hand and right-hand first massaging members move away each other, and the paired left-hand and right-hand second massaging members move away from each other.

4. The massager according to claim 3, comprising:

a rotating shaft to rotate under a rotational driving force outputted from the driver;

a first rock converter to convert the rotational driving force on the rotating shaft into reciprocal rocking motion for approaching-separating movement, and impart back-and-forth and side-to-side rocking motion to the paired left-hand and right-hand first massaging members; and

a second rock converter to convert the rotational driving force on the rotating shaft into reciprocal rocking motion for approaching-separating movement, and impart back-and-forth and side-to-side rocking motion to the paired left-hand and right-hand second massaging members, wherein

the first rock converter and the second rock converter, while allowing synchronization of reciprocal rocking motion, perform conversion into rocking motion corresponding to a repeat of mutual approaching-separating

movement of the first massage unit and the second massage unit in the front-rear direction, and conversion into rocking motion corresponding to a repeat of holding-releasing movement of the paired left-hand and right-hand first massaging members, as well as holding-releasing movement of the paired left-hand and right-hand second massaging members, in the right-left direction.

5. The massager according to claim 4, wherein
- the first rock converter includes
 - a first rotating boss member to eccentrically rotate with respect to the rotating shaft, the first rotating boss member having a first cam surface inclined with respect to an axis of the rotating shaft,
 - a first annular fit provided in the first massaging member, the first annular fit being fitted about an outer edge of the first rotating boss member, and
 - a first rotation restrainer to restrain the first massaging member from rotating together with the rotating shaft, and wherein
 - the second rock converter includes
 - a second rotating boss member to eccentrically rotate with respect to the rotating shaft, the second rotating boss member having a second cam surface inclined with respect to the axis of the rotating shaft,

a second annular fit provided in the second massaging member, the second annular fit being fitted about an outer edge of the second rotating boss member, and

a second rotation restrainer to restrain the second massaging member from rotating together with the rotating shaft,

the first cam surface and the second cam surface being inclined in different directions with respect to a direction axially of the rotating shaft.

6. The massager according to claim 4 or claim 5, comprising:

a shaft angle detector to detect an angle of rotation of the rotating shaft; and

a controller to control drive operation of the first massage unit and the second massage unit, wherein

when the shaft angle detector detects a predetermined rotation angle of the rotating shaft, the controller recognizes that the paired left-hand and right-hand first massaging members sandwich and hold the first treatment target area from both sides in the right-left direction, and the paired left-hand and right-hand second massaging members sandwich and hold the second treatment target area from both sides in the right-left direction, and keeps the treatment target areas in a sandwiched state until the

first massage unit and the second massage unit moving away from each other in the front-rear direction reach their respective predetermined positions.

7. The massager according to any one of claims 3 to 6, wherein

each of a spacing between the paired left-hand and right-hand first massaging members in the right-left direction and a spacing between the paired left-hand and right-hand second massaging members in the right-left direction can be widened.

8. The massager according to claim 7, comprising:

a first connecting rod member facing horizontally and outwardly with respect to the rotating shaft, the first connecting rod member having a front end coupled to a lengthwise intermediate location of the first massaging member;

the first rotating boss member mounted for unitary rotation with the rotating shaft;

the first annular fit disposed on a base-end side of the first connecting rod member and fitted about the outer edge of the first rotating boss member; and

a first resilient member horizontally laid on a base-end side of the first massaging member, wherein

the first resilient member is mounted so as to lie between the base-end sides of, respectively, the paired left-hand and right-hand first massaging members in the right-left direction, and

the spacing between the paired left-hand and right-hand first massaging members in the right-left direction is widened when the first resilient member is caused to contract by the first massaging members.

9. The massager according to claim 8, wherein

when front ends of, respectively, the paired left-hand and right-hand first massaging members move away from each other, each of the first massaging members rotates about the front end of the first connecting rod member with consequent contraction of the first resilient member, thereby providing wider spacing between the paired left-hand and right-hand first massaging members in the right-left direction.

10. The massager according to claim 7, comprising:

a second connecting rod member facing horizontally and outwardly with respect to the rotating shaft, the second connecting rod member having a front end coupled to a lengthwise intermediate location of the second massaging member;

the second rotating boss member mounted for unitary rotation with the rotating shaft;

the second annular fit disposed on a base-end side of the second connecting rod member and fitted about the outer edge of the second rotating boss member; and

a second resilient member horizontally laid on a base-end side of the second massaging member, wherein

the second resilient member is mounted so as to lie between the base-end sides of, respectively, the paired left-hand and right-hand second massaging members in the right-left direction, and

the spacing between the paired left-hand and right-hand second massaging members in the right-left direction is widened when the second resilient member is caused to contract by the second massaging members.

11. The massager according to claim 8, wherein

when front ends of, respectively, the paired left-hand and right-hand second massaging members move away from each other, each of the second massaging members rotates about the front end of the second connecting rod member with consequent contraction of the second resilient member, thereby providing wider spacing between the paired left-hand and right-hand second massaging members in the right-left direction.

12. The massager according to any one of claims 1 to 11,
wherein

the driver includes a single drive motor, and

the drive motor drives the first massage unit and the
second massage unit.

13. The massager according to any one of claims 1 to 12,
wherein

the first treatment target area is defined as a palm
constituting a hand of a user,

the second treatment target area is defined as
fingers constituting the hand of the user, and

the first resilient member and the second resilient
member are each constructed of a spring member.