

DESCRIPTION

Title of the Invention: MASSAGING APPARATUS

Technical Field

[0001] The present invention relates to a massaging apparatus capable of selective performance of different massaging operations.

Background Art

[0002] Examples of heretofore known massages for massage target areas of user's body include: "kneading massage" which is effected by operating a massager piece to move in a state of being pressed against a target area; "tapping massage" which is effected by operating a massager piece to tap a target area; and "grabbing massage" which is effected by operating two massager pieces to impart massaging stimulation to a target area gripped between them.

[0003] These various massages, being different from one another in the degree of massaging effect on a massage target area or in user's impression of massage, are produced independently of one another or produced in cooperative relation with one another selectively in accordance with user's preference. Hence, in a massaging apparatus such as disclosed in Patent Literature 1, a driving section is assigned to each and every massaging mode in order that a variety of different massages can be produced by exercising control on a plurality of driving

sections.

[0004] That is, in Patent Literature 1, there is disclosed a massaging apparatus provided internally with a driving motor for massage level control, a driving motor for kneading massage, a driving motor for tapping massage, and so forth. The massaging apparatus disclosed in Patent Literature 1 is capable of performing a variety of different massages on a massage target area by operating the driving motor for massage level control, the driving motor for kneading massage, the driving motor for tapping massage, and so forth on an individual basis.

Prior Art Reference

Citation List

[0005] Patent Literature 1: Japanese Unexamined Patent Publication JP-A 2015-9103

Summary of Invention

Technical Problem

[0006] Due to the weight of a motor being large compared to the weights of other components, the placement of a plurality of motors, such as the driving motor for massage level control, the driving motor for kneading massage, and the driving motor for tapping massage as described in Patent Literature 1, renders the massaging apparatus as a whole very heavy. As a matter of course, the transportation and setting of such a heavyweight massaging apparatus will be difficult.

Furthermore, the installation of a plurality of motors

in a single massaging apparatus entails a plurality of motor control mechanisms, which results in an increase of the complexity of the internal structure of the massaging apparatus. Such a complicated apparatus constitution may undesirably impair the operability and easiness of maintenance of the massaging apparatus. In addition, due to the cost of a motor being high compared to the costs of other components for use in a massaging apparatus, the placement of a plurality of motors inevitably leads to rising massaging apparatus prices.

[0007] Accordingly, an object of the present invention is to provide a massaging apparatus which is simple in apparatus structure and is yet capable of selective performance of different massaging operations.

Solution to Problem

[0008] In order to achieve the described object, the following technical means is adopted for the implementation of the present invention.

A massaging apparatus pursuant to the present invention comprises: a driving section for producing a rotatably driving force; a first massaging mechanism for performing massage on a massage target area of user's body; a second massaging mechanism for effecting different massage from that produced by the first massaging mechanism; and a power transmission mechanism for enabling transmission of the rotatably driving force of the driving section to the first massaging mechanism and the second

massaging mechanism. The power transmission mechanism is designed so that, when the driving section is operated to produce a rotatably driving force for rotation in a normal direction, the rotatably driving force is transmitted to both of the first massaging mechanism and the second massaging mechanism, whereas, when the driving section is operated to produce a rotatably driving force for rotation in a reverse direction, power is transmitted to the first massaging mechanism alone.

[0009] In the present invention, it is preferable that the first massaging mechanism is a kneading massaging mechanism for performing kneading massaging on the massaging target area of user's body, and that the second massaging mechanism is a tapping massaging mechanism for performing tapping massaging on the massaging target area of user's body.

In the present invention, it is preferable that the driving section comprises a single driving motor.

In the present invention, it is preferable that the driving motor is a double-shaft motor having a one end-side driving shaft and an other end-side driving shaft, and that the power transmission mechanism comprises: a kneading rotation shaft coupled to the one end-side driving shaft, for transmitting a rotatably driving force of the one end-side driving shaft to the kneading massaging mechanism; a tapping rotation shaft coupled to the other end-side driving shaft, for transmitting a rotatably driving force of the other end-side driving shaft to the tapping

massage mechanism; and a clutch member disposed at the tapping rotation shaft, for effecting switching between execution and nonexecution of rotatably driving force transmission depending on a direction of rotation of the other end-side driving shaft.

[0010] In the present invention, it is preferable that the clutch member is constructed of a one-way clutch which effects transmission of a rotatably driving force to the tapping rotation shaft on rotation of the other end-side driving shaft in a normal direction, and restrains transmission of a rotatably driving force to the tapping rotation shaft on rotation of the other end-side driving shaft in a reverse direction.

In the present invention, it is preferable that the kneading massage mechanism comprises: an inclined boss member attached to the kneading rotation shaft, with its inclined cam face inclined with respect to an axis of the kneading rotation shaft; an annular fit portion which is slidably fitted to the inclined cam face of the inclined boss member; a kneading arm member which is provided at its basal end with the annular fit portion, and has its front end extended radially outwardly; a kneading massager disposed at the front end of the kneading arm member; and a restraint member for restraining the kneading arm member from rotating in accompanying relation with the kneading rotation shaft.

[0011] In the present invention, it is preferable that the kneading rotation shaft is provided with a grabbing massage member

having a grabbing massager which moves close to and away from the kneading massager of the kneading massager member.

In the present invention, it is preferable that the tapping massager mechanism comprises: an engagement piece disposed on a side of the tapping massager mechanism opposite the kneading massager, with the axis of the kneading rotation shaft lying between the engagement piece and the kneading massager; a tapping boss member attached to the tapping rotation shaft for eccentric rotation with respect to the axis of the tapping rotation shaft; and a coupling shaft which is rotatably fitted to an outer periphery of the tapping boss member at one end, and is coupled to the engagement piece at the other end via a universal joint.

Advantageous Effects of Invention

[0012] The massaging apparatus pursuant to the present invention is simple in apparatus structure and is yet capable of selective performance of different massaging operations.

Brief Description of Drawings

[0013] [FIG. 1] FIG. 1 is a perspective view of a massaging apparatus according to a present embodiment as seen from above.

[FIG. 2] FIG. 2 is a perspective view of a massaging mechanism provided in the massaging apparatus according to the embodiment as seen from below.

[FIG. 3] FIG. 3 is a drawing of the massaging mechanism of the embodiment as seen from rear.

[FIG. 4] FIG. 4 is a plan sectional view taken along

a first rotation shaft.

[FIG. 5A] FIG. 5A is a drawing showing a power-transmitting condition corresponding to a case where both of first and second massaging mechanisms are operated.

[FIG. 5B] FIG. 5B is a drawing showing a power-transmitting condition corresponding to a case where only the first massaging mechanism is operated.

[FIG. 6A] FIG. 6A is a drawing (perspective view) showing a power-transmitting condition corresponding to a case where both of the first and second massaging mechanisms are operated (as seen from below).

[FIG. 6B] FIG. 6B is a drawing (perspective view) showing a power-transmitting condition corresponding to a case where only the first massaging mechanism is operated (as seen from below).

Description of Embodiments

[0014] Hereinafter, a massaging apparatus pursuant to the present invention will be described with reference to drawings.

As shown in FIG. 1, a massaging apparatus 1 in accordance with an embodiment of the invention, while being worn by a user with its casing 2 (apparatus main body) having right-hand and left-hand extending handles set on a massage target area such as user's shoulder or waist for passage over the target area, performs massage on the target area by pressing a massager incorporated in the casing 2 against the target area.

[0015] More specifically, the massaging apparatus 1 according to this embodiment comprises the casing 2 which looks like the letter "U" as viewed from above. The casing 2 has its left-hand and right-hand ends extended forward to provide handle portions 3L and 3R. Moreover, the casing 2 is provided with a massaging mechanism 4 situated between the left-hand and right-hand handle portions 3L and 3R to perform massage on a target area. The massaging mechanism 4 is situated behind the handle portions 3L and 3R to achieve massage on a target area at user's back. That is, the massaging apparatus 1 according to this embodiment can be changed in its position as required by grippingly moving the described handle portions 3L and 3R with user's hands to massage other area of user's body by the massager.

[0016] More specifically, that part of the casing 2 located between the left-hand and right-hand handle portions 3L and 3R opens forwardly to define an opening 5. The described massaging mechanism 4 is housed inside the casing 2 with its massager (a kneading massager 6 and a grabbing massager 7 as will hereafter be described) protruding forwardly out of the opening 5.

Moreover, that part of the casing 2 located in the vicinity of the left-hand handle 3L is provided with various buttons 8, including a power button for the supply of power to the massaging mechanism 4, a selector button for selection among different massage courses or massage modes, a condition-changing button

for effecting changes of massage conditions such as massaging time and massaging force level. Formed at the tip of the handle 3L is a power cord entry 9.

[0017] Although, in the massaging apparatus 1, in reality, the opening 5 of the casing 2 is covered with a cover to prevent intrusion of foreign material into the massaging mechanism 4, the illustration of the cover is omitted from FIG. 1.

FIGS. 2 and 3 are drawings showing the massaging mechanism 4 provided in the massaging apparatus 1 according to this embodiment.

[0018] The massaging mechanism 4 of the present invention comprises: a driving section 10 for producing a rotatably driving force; a first massaging mechanism 11 for performing massage on a massage target area of user's body; a second massaging mechanism 12 for effecting different massage from that produced by the first massaging mechanism 11; and a power transmission mechanism 13 for enabling transmission of the rotatably driving force of the driving section 10 to the first massaging mechanism 11 and the second massaging mechanism 12.

[0019] The described power transmission mechanism 13 is designed so that, when the driving section 10 is operated to produce a rotatably driving force for rotation in a normal direction, the produced rotatably driving force is transmitted to both of the first massaging mechanism 11 and the second massaging mechanism 12, whereas, when the driving section 10

is operated to produce a rotatably driving force for rotation in a reverse direction, the produced rotatably driving force is transmitted to the first massaging mechanism 11 alone.

The following describes the driving section 10, the first massaging mechanism 11, the second massaging mechanism 12, and the power transmission mechanism 13 constituting the massaging mechanism 4 of this embodiment.

[0020] The driving section 10 serves to produce a rotatably driving force for driving the described first and second massaging mechanisms 11 and 12, and so forth. In this embodiment, the driving section 10 comprises a single driving motor 14. The driving motor 14, which is a double-shaft motor installed with its driving shafts 15 oriented in a vertical direction, is designed so that a rotatably driving force can be outputted from each of the upwardly-extending driving shaft 15 (one end-side driving shaft 15U) and the downwardly-extending driving shaft 15 (the other end-side driving shaft 15D).

[0021] In this embodiment, the upper driving shaft 15U (one end-side driving shaft) produces output of a rotatably driving force to the first massaging mechanism 11, and, the lower driving shaft 15D (the other end-side driving shaft) produces output of a rotatably driving force to the second massaging mechanism 12. That is, a first power transmission mechanism 16 is disposed between the upper driving shaft 15U and the first massaging mechanism 11, and, a second power transmission mechanism 17 is

disposed between the lower driving shaft 15D and the second massaging mechanism 12, so that the rotatably driving force of the driving shaft 15 can be transmitted to each of the massaging mechanisms 11 and 12 separately.

[0022] The massaging apparatus 1 pursuant to the present invention is characterized in that a variety of different massages can be effected by selective operation of a plurality of the massaging mechanisms 11 and 12 using only one driving motor 14. With such a capability of transmitting a rotatably driving force to each of a plurality of the massaging mechanisms 11 and 12 separately through a single driving motor 14, the number of the driving sections 10 to be placed can be minimized, with the consequent constructional simplicity of the massaging mechanism 4. This makes it possible to avoid an increase in both the weight and the price of the apparatus.

[0023] In this regard, the massaging mechanism 4 provided in the massaging apparatus 1 according to this embodiment employs, as any one of the described first and second power transmission mechanisms 16 and 17, a system which effects transmission of a rotatably driving force on rotation of the driving shaft 15 of the driving section 10 in a normal direction, but effects no rotatably driving force transmission on rotation of the driving shaft 15 in a reverse direction. For example, in the case of the massaging mechanism 4 of this embodiment, a system capable of effecting switching between execution and non-execution of

rotatably driving force transmission depending on the direction of rotation of the driving shaft 15 is employed as the described second power transmission mechanism 17. More specifically, in this embodiment, there is provided a one-way clutch 18 (one-way clutch section) as means for effecting switching between execution and nonexecution of rotatably driving force transmission depending on the direction of rotation of the driving shaft 15.

[0024] As the one-way clutch 18 of the present invention, use can be made of various means capable of effecting switching between execution and nonexecution of rotatably driving force transmission depending on the direction of rotation of the driving shaft 15. The one-way clutch 18 is, as exemplified, composed of a toothed portion disposed at a driving shaft (second rotation shaft 19 which will hereafter be described) and a pawl portion formed on the inner periphery of a driven member (second worm wheel 21 which will hereafter be described). In the one-way clutch 18, the teeth of the toothed portion are formed inclined tangentially with respect to the second worm wheel 21 to constitute a ratchet mechanism in which the pawl portion is brought into engagement or kept out of engagement with the toothed portion depending on the direction of rotation of the second worm wheel 21.

[0025] That is, as shown in FIG. 5A, in the massaging mechanism 4 of this embodiment, when the driving shaft 15 is

rotated in the normal direction, the pawl portion of the one-way clutch 18 engages the toothed portion, thus enabling transmission of a rotatably driving force exerted by the driving shaft 15 rotating in the normal direction to the second rotation shaft 19. On the other hand, as shown in FIG. 5B, when the driving shaft 15 is rotated in the reverse direction, the pawl portion of the one-way clutch 18 slips off the toothed portion, in consequence whereof there results no transmission of a rotatably driving force exerted by the driving shaft 15 rotating in the reverse direction to the second rotation shaft 19.

[0026] As a result, as shown in FIG. 6A, when the driving shaft 15 is rotated in the normal direction, a first rotation shaft 23 and the second rotation shaft 19 are rotatably driven concurrently, thus actuating the first massaging mechanism 11 coupled to the first rotation shaft 23 and the second massaging mechanism 12 coupled to the second rotation shaft 19.

On the other hand, as shown in FIG. 6B, when the driving shaft 15 is rotated in the reverse direction, the first rotation shaft 23 is rotatably driven, whereas the second rotation shaft 19 is not rotatably driven. That is, the first massaging mechanism 11 is operated, whereas the second massaging mechanism 12 remains unoperated.

[0027] The described ratchet mechanism has been given merely as an example of the one-way clutch 18 capable of effecting switching between execution and nonexecution of rotatably

driving force transmission depending on the direction of rotation of the driving shaft 15. As a member for effecting switching between execution and nonexecution of rotatably driving force transmission depending on the direction of rotation of the driving shaft 15, use can be made of a sprag-type or cam-type member.

The described massaging mechanism 4 is capable of effecting switching between execution and nonexecution of rotatably driving force transmission depending on the direction of rotation of the driving shaft 15. This makes it possible to select the desired massaging mechanism 4 for operation simply by changing the direction of rotation of the driving shaft 15. Hence, even if only one driving motor 14 is placed, a variety of different massages can be effected by selective operation of the massaging mechanisms 4.

[0028] Where the described first and second power transmission mechanisms 16 and 17 are concerned, use can be made of, of the massaging mechanisms 4 that utilize the rotatably driving force of the driving section 10, those that differ from each other in respect of, for example, "type of massage" or "target area position". For example, when applying a kneading massage mechanism 24 to the first massaging mechanism 11 as practiced in this embodiment, a tapping massage mechanism 25 for providing a different type of massage can be applied to the second massaging mechanism 12. Moreover, when applying a shoulder-kneading massage mechanism to the first massaging mechanism 11, a

back-kneading massage mechanism based on the kneading massage mechanism 24 for providing the same type of massage can be applied to the second massaging mechanism 12. Besides, a plurality of kneading massage mechanisms 24, tapping massage mechanisms 25, grabbing massage mechanisms 26, etc. may be provided in the first massaging mechanism 11 or the second massaging mechanism 12. That is, the massaging mechanism 4 of the present invention is designed so that a rotatably driving force exerted by the driving section 10 is transmitted through the power transmission mechanism 13 to a plurality of massaging mechanisms 4 that differ in "type of massage", "target area position", etc. from each other, whereby these massaging mechanisms 4 can be operated in a selective manner.

[0029] The following describes the massaging apparatus 1 according to this embodiment with respect to the case where, as an example of the massaging mechanism 4, the kneading massage mechanism 24 and the grabbing massage mechanism 26 are applied to the first massaging mechanism 11, and the tapping massage mechanism 25 is applied to the second massaging mechanism 12 capable of changing of operation conditions depending on the direction of rotation of the driving section 10.

As shown in FIG. 3, the described first power transmission mechanism 16 comprises: a first worm gear 27 attached to the one end-side driving shaft 15U of the driving motor 14; and a first worm wheel 29 attached to a reduction shaft 28 oriented

perpendicular to the upper driving shaft 15U (oriented in a horizontal direction) so as to mesh with the first worm gear 27. Moreover, the reduction shaft 28 is further provided with a first reduction gear 30 disposed to mesh with a second reduction gear 31 of the first rotation shaft 23 disposed in parallel with the reduction shaft 28. That is, the reduction shaft 28, the first reduction gear 30, the first rotation shaft 23, and the second reduction gear 31 as above described constitute the first power transmission mechanism 16 for transmitting a rotatably driving force exerted by the upper driving shaft 15U of the driving motor 14 to the first rotation shaft 23. The rotatably driving force of the upper driving shaft 15U is deceleratingly transmitted to the first rotation shaft 23.

[0030] In the case of the massaging apparatus 1 according to this embodiment, the first massaging mechanism 11 is intended solely for kneading massage. Hence, in what follows, the first rotation shaft 23 may be also referred to as "kneading rotation shaft".

The kneading massage mechanism 24 presses the kneading massager 6 against a massage target area such as user's shoulder, back, or waist to perform kneading massage on the target area by the kneading massager 6. The kneading massage mechanism 24 is designed to operate by exploiting part of the rotatably driving force of the driving section 10 transmitted to the kneading rotation shaft (first rotation shaft 23) by the described first

power transmission mechanism 16.

[0031] More specifically, the described kneading massage mechanism 24 comprises: an inclined boss member 33 attached to the kneading rotation shaft, with its inclined cam face 32 inclined with respect to the axis of the kneading rotation shaft; a first annular fit portion 34 which is slidably fitted to the inclined cam face 32 of the inclined boss member 33; a kneading arm member 35 which is provided at its basal end with the first annular fit portion 34, and has its front end extended radially outwardly; a kneading massager 6 disposed at the front end of the kneading arm member 35; and a ball joint portion 36 (first restraint member) for restraining the kneading arm member 35 from rotating in accompanying relation with the kneading rotation shaft.

[0032] As shown in FIG. 4, the inclined boss member 33 is a cylindrical member disposed at each of the opposite ends of the kneading rotation shaft. That is, the left end and the right end of the kneading rotation shaft are each provided with a single inclined boss member 33. The outer periphery of each inclined boss member 33 is formed with the inclined cam face 32 which goes around an axis inclined with respect to the axis of the kneading rotation shaft (first rotation shaft 23). The inclined boss member 33 at the left end and the inclined boss member 33 at the right end are arranged so that their inclined cam faces 32 are inclined in opposite directions. That is, in FIG. 4, when the inclined cam face 32 of the inclined boss member at

the left end is inclined downward to the left, the inclined cam face 32 of the inclined boss member at the right end is inclined downward to the right. On the other hand, when the inclined cam face 32 of the inclined boss member at the left end is inclined downward to the right, the inclined cam face 32 of the inclined boss member at the right end is inclined downward to the left. Rotatably fitted to each inclined cam face 32 via a rotation shaft bearing is the first annular fit portion 34.

[0033] The first annular fit portion 34 is a cylindrical member rotatably fitted to the described inclined cam face 32 of the inclined boss member 33. Disposed at the first annular fit portion 34 is the kneading arm member 35 which is provided at its basal end with the first annular fit portion 34, and has its front end extended radially outwardly.

 The kneading arm member 35 disposed at the outer periphery of the first annular fit portion 34 looks like a substantially rhombus-shaped plate member elongated in a front-rear direction as seen from the right or left side. That is, the kneading arm member 35 has the first annular fit portion 34 intermediate the length thereof. Moreover, lengthwise one end of the kneading arm member 35 protrudes forward, and, the kneading massager 6 is attached to this forwardly protruding end (forward end). Besides, lengthwise the other end of the kneading arm member 35 protrudes rearward, and, the ball joint portion 36 built as a universal joint (engagement piece) is attached to this

rearwardly protruding end (rear end).

[0034] The ball joint portion 36 is a member to impart a tapping-massage driving force exerted by the tapping massage mechanism 25 to the described kneading arm member 35, and serves also as a first restraining member for restraining the kneading arm member 35 from rotating in accompanying relation with the kneading rotation shaft. The ball joint portion 36 will hereafter be described in detail in the explanation of the tapping massage mechanism 25.

[0035] In the massaging mechanism 4 of this embodiment, as the described first massaging mechanism 11, in addition to the kneading massage mechanism 24, the grabbing massage mechanism 26 is provided.

The grabbing massage mechanism 26 comprises: an eccentric boss member 38 attached to the described kneading rotation shaft, with its eccentric cam face 37 arranged eccentrically to the axis of the kneading rotation shaft; a second annular fit portion 39 which is slidably fitted to the eccentric cam face 37 of the eccentric boss member 38; a grabbing arm member 40 which is provided at its basal end with the second annular fit portion 39, and has its front end extended radially outwardly; a grabbing massager 7 disposed at the front end of the grabbing arm member 40; and a rotation restraint piece 41 (second restraint member) for restraining the grabbing arm member 40 from rotating in accompanying relation with the kneading rotation shaft.

[0036] The eccentric boss member 38 is a cylindrical member disposed toward each of the opposite ends of the kneading rotation shaft. That is, each of the eccentric boss members 38 lies closer to the center of the kneading rotation shaft than does corresponding one of the inclined boss member 33. The outer periphery of each eccentric boss member 38 is formed with the eccentric cam face 37 in the form of a cylindrical surface that goes around an axis which is eccentric with respect to the axis of the kneading rotation shaft. The left end-side eccentric boss member 38 and the right end-side eccentric boss member 38 are arranged so that the axes of their eccentric cam faces 37 are decentered in the same direction. When the center of the eccentric cam face 37 (the axis of rotation of the cylindrical surface) of the left end-side eccentric boss member is offset in a certain direction under a certain rotation phase, then the center of the eccentric cam face 37 (the axis of rotation of the cylindrical surface) of the right end-side eccentric boss member is offset in the same direction. Rotatably fitted to each eccentric cam face 37 is the second annular fit portion 39.

[0037] The second annular fit portion 39 is a cylindrical member rotatably fitted to the described eccentric cam face 37 of the eccentric boss member 38. Disposed at the second annular fit portion 39 is the grabbing arm member 40 which is provided at its basal end with the second annular fit portion 39, and has its front end extended radially outwardly.

The grabbing arm member 40 is a member disposed at the outer periphery of the second annular fit portion 39. The basal end of the grabbing arm member 40 is provided with the second annular fit portion 39. Moreover, the front end of the grabbing arm member 40 is located below and forward of the basal end defined as a reference, and, the grabbing massager 7 is disposed at this downwardly protruding front end of the grabbing arm member 40.

[0038] The grabbing massager 7 is given the form of a forwardly curved semicircular member to cause no pain to a massage target area during gripping action, and, the target area can be subjected to grabbing massage by being gripped between the grabbing massager 7 and the kneading massager 6.

The rotation restraint piece 41 in the form of an arcuate plate member extending in the front-rear direction serves as a second restraint member which restrains the grabbing arm member 40 from rotating in accompanying relation with the kneading rotation shaft by coupling the grabbing arm member 40 to a motor housing (casing 2). More specifically, the rotation restraint piece 41 is a long plate member disposed inclined forwardly and downwardly from rear to front of the apparatus. The rear end of the rotation restraint piece 41 is coupled for rocking motion about a horizontally oriented axis relative to the a motor housing (casing 2). Moreover, the forward end of the rotation restraint piece 41 is coupled for rocking motion about a horizontally oriented axis to an intermediate part of the grabbing arm member

40 in the front-rear direction.

[0039] In the described first massaging mechanism 11, namely the kneading massaging mechanism 24 and the grabbing massaging mechanism 26, a rotatably driving force outputted from the upper driving shaft 15U of the driving motor 14 is transmitted through the described first power transmission mechanism 16 to the kneading rotation shaft (first rotation shaft 23). The rotatably driving force is converted into a motion to rock the kneading arm member 35 in the horizontal direction via the inclined boss member 33, the first annular fit portion 34, and the ball joint portion 36 (first restraint member). This allows the left-hand and right-hand kneading arm members 35 to move close to and away from each other, thus performing kneading massaging on a massaging target area lying between the left-hand and right-hand kneading arm members 35.

[0040] Meanwhile, in the grabbing massaging mechanism 26, the rotatably driving force outputted from the upper driving shaft 15U is converted into a motion to rock the grabbing arm member 40 in the vertical direction via the eccentric boss member 38, the second annular fit portion 39, and the second restraint member. This allows the grabbing massaging mechanism 26 to perform grabbing massaging such as to grippingly pick up a massaging target area lying between the kneading massager 6 and the grabbing massager 7.

[0041] The operation of the kneading massaging mechanism 24

and the grabbing massage mechanism 26 thus far described is effected in the same way regardless of whether the driving shaft 15 is rotated in the normal direction or in the reverse direction.

In contrast to the described first massaging mechanism 11, the second massaging mechanism 12 is operated by exploiting a rotatably driving force outputted from the lower driving shaft 15D (the other end-side driving shaft) of the driving section 10. That is, the second massaging mechanism 12 is designed so that the rotatably driving force exerted by the driving section 10 is transmitted through the second power transmission mechanism 17 to the second rotation shaft 19.

[0042] The described second power transmission mechanism 17 comprises: a second worm gear 42 attached to the lower driving shaft 15D of the driving motor 14; and a second worm wheel 21 disposed to mesh with the second worm gear 42. The second worm wheel 21 is attached to the second rotation shaft 19 oriented perpendicular to the lower driving shaft 15D (oriented in the horizontal direction). That is, the second worm gear 42, the second worm wheel 21, and the second rotation shaft 19 constitute the described second power transmission mechanism 17.

[0043] In the case of the massaging apparatus 1 according to this embodiment, the second massaging mechanism 12 is intended solely for tapping massage. Hence, in what follows, the second rotation shaft 19 may be also referred to as "tapping rotation shaft".

The tapping massage mechanism 25 taps the kneading massager 6 against a massage target area such as user's shoulder, back, or waist at brief time intervals to perform tapping massage on the target area with the tapping action of the kneading massager 6. The tapping massage mechanism 25 is designed to operate by exploiting part of the rotatably driving force of the driving section 10 transmitted to the tapping rotation shaft (second rotation shaft 19) by the described second power transmission mechanism 17.

[0044] More specifically, the described tapping massage mechanism 25 comprises: a cylindrical tapping boss member 43 attached to the tapping rotation shaft with its axis arranged eccentrically to the axis of the tapping rotation shaft; and a coupling shaft 45 which is slidably fitted to the outer periphery of the tapping boss member 43 at one end, and has a boot portion 44 for receiving the ball joint portion 36 of the kneading arm member 35 at the other end.

[0045] The tapping boss member 43 disposed at each of the opposite ends of the tapping rotation shaft is formed as a cylindrical member whose axis is arranged eccentrically to the axis of the tapping rotation shaft. The tapping boss member 43 has an outer periphery in the form of a cylindrical surface, and, one end of the coupling shaft 45 is fitted to the outer periphery for rotation about a horizontally oriented axis.

The coupling shaft 45 is a vertically elongated long member

for transmitting a rotatably driving force exerted by the tapping rotation shaft to the kneading arm member 35. More specifically, one end (lower end) of the coupling shaft 45 is rotatably fitted to the outer periphery of the described tapping boss member 43, and, the lower end of the coupling shaft 45 is coupled to the tapping boss member 43 for rotation about a horizontally oriented axis. Moreover, the other end (upper end) of the coupling shaft 45 is formed with the boot portion 44 for receiving the ball joint portion 36 of the kneading arm member 35. The boot portion 44 is concavely curved rearwardly in the form of a spherical recess capable of bearing of the ball joint portion 36. The ball joint portion 36 of the kneading arm member 35 is inserted into the boot portion 44 from in front to permit coupling between the kneading arm member 35 and the coupling shaft 45. Moreover, a lengthwise intermediate part of the coupling shaft 45 is rendered rockable about an axis oriented in the front-rear direction to permit connection with the kneading arm member 35 in a horizontally rocking state.

[0046] The ball joint portion 36 is a rearwardly protruding spherical member disposed at the end (rear end) of the kneading arm member 35 opposite from the end thereof provided with the kneading massager 6. The ball joint portion 36, whose outside diameter is substantially equal to or slightly smaller than the inside diameter of the boot portion 44, is coupled to the boot portion 44 for vertical and horizontal rocking motion.

In the described tapping massage mechanism 25, a rotatably driving force outputted from the lower driving shaft 15D of the driving motor 14 is transmitted through the described second power transmission mechanism 17 to the tapping rotation shaft (second rotation shaft 19). The rotatably driving force is transmitted through the tapping boss member 43, the coupling shaft 45, and the universal joint (the ball joint portion 36 and the boot portion 44) to the kneading arm member 35, causing the kneading arm member 35 to move (oscillate) vertically reciprocally. Hence, in the described second massaging mechanism 12, under the rotatably driving force outputted from the lower driving shaft 15D of the driving motor 14, the kneading arm member 35 reciprocates in the front-rear direction at brief time intervals, thus performing tapping massage such as to tap the kneading massager 6 against a massage target area.

[0047] The operation of the second massaging mechanism 12 thus far described corresponds to the case where the driving shaft 15 is rotated in the normal direction. When the driving shaft 15 is rotated in the reverse direction, the rotatably driving force of the driving shaft 15 is inhibited from transmission to the second rotation shaft 19 (tapping rotation shaft) by the described one-way clutch 18, wherefore the second massaging mechanism 12 no longer effects massaging operation.

That is, in the ratchet mechanism-based one-way clutch 18 of this embodiment, when the driving shaft 15 is rotated in

the normal direction, the pawl portion 22 of the one-way clutch 18 engages the toothed portion 20, thus enabling transmission of the rotatably driving force of the driving shaft 15 rotating in the normal direction to the second rotation shaft 19. On the other hand, when the driving shaft 15 is rotated in the reverse direction, the pawl portion 22 of the one-way clutch 18 slips off the toothed portion 20, in consequence whereof there results no transmission of the rotatably driving force of the driving shaft 15 rotating in the reverse direction to the second rotation shaft 19.

[0048] As a result, when the driving shaft 15 is rotated in the normal direction, the first rotation shaft 23 and the second rotation shaft 19 are rotatably driven concurrently, thus actuating the first massaging mechanism 11 and the second massaging mechanism 12. On the other hand, when the driving shaft 15 is rotated in the reverse direction, the first rotation shaft 23 is rotatably driven, whereas the second rotation shaft 19 is not rotatably driven. That is, the first massaging mechanism 11 is operated, whereas the second massaging mechanism 12 remains unoperated.

[0049] The described massaging apparatus 1 according to this embodiment is capable of effecting switching between a massaging condition where the first massaging mechanism 11 and the second massaging mechanism 12 operate in conjunction with each other and a massaging condition where the first massaging

mechanism 11 is operated but the second massaging mechanism 12 remains unoperated, depending on the direction of rotation of the driving shaft 15. Hence, a variety of different massages can be effected even with use of a single driving section 10 (driving motor 14).

[0050] In addition, only one driving motor 14 of an expensive and heavy nature is required to achieve a variety of different massages. This makes it possible to simplify the structure of the apparatus, render the apparatus lighter in weight, and yet avoid rising apparatus prices.

It should be understood that the embodiments as disclosed herein are considered in all respects as illustrative only and not restrictive. As to particulars that are not explicitly specified in the disclosure of each embodiment, for example, as to working and operating conditions, various parameters, and the dimensions, weights, and volumes of constituent components, use may be made of values adopted in the light of the common knowledge of those skilled in the art without departing from the practical ranges.

[0051] For example, while, in this description, the hand-held massager exemplifies the massaging apparatus 1 pursuant to the present invention, the massaging apparatus 1 is applicable to a chair massager, a seat massager, or a legless chair massager.

Moreover, the massaging apparatus 1 pursuant to the present

invention has been illustrated as the embodiment in which the one-way clutch 18 is disposed in the tapping massage mechanism 25 (the second massaging mechanism 12). However, the location of placement of the one-way clutch 18 is not limited to the tapping massage mechanism 25 (the second massaging mechanism 12). For example, the one-way clutch 18 may be disposed either in the kneading massage mechanism 24 or in the grabbing massage mechanism 26, and more specifically, it may be disposed at the first rotation shaft 23 of the first massaging mechanism 11.

Explanation of reference symbols

[0052]

- 1 Messaging apparatus
- 2 Casing (Apparatus main body)
- 3L Left-hand handle portion
- 3R Right-hand handle portion
- 4 Massaging mechanism
- 5 Opening
- 6 Kneading massager
- 7 Grabbing massager
- 8 Various buttons
- 9 Power cord entry
- 10 Driving section
- 11 First massaging mechanism
- 12 Second massaging mechanism
- 13 Power transmission mechanism

14	Driving motor
15	Driving shaft
15U	Upper driving shaft
15D	Lower driving shaft
16	First power transmission mechanism
17	Second power transmission mechanism
18	One-way clutch (One-way clutch section)
19	Second rotation shaft
20	Toothed portion
21	Second worm wheel
22	Pawl portion
23	First rotation shaft
24	Kneading massage mechanism
25	Tapping massage mechanism
26	Grabbing massage mechanism
27	First worm gear
28	Reduction shaft
29	First worm wheel
30	First reduction gear
31	Second reduction gear
32	Inclined cam face
33	Inclined boss member
34	First annular fit portion
35	Kneading arm member
36	Ball joint portion (first restraint member)

- 37 Eccentric cam face
- 38 Eccentric boss member
- 39 Second annular fit portion
- 40 Grabbing arm member
- 41 Rotation restraint piece (Second restraint member)
- 42 Second worm gear
- 43 Tapping boss member
- 44 Boot portion
- 45 Coupling shaft

CLAIMS

1. A massaging apparatus comprising:
 - a driving section for producing a rotatably driving force;
 - a first massaging mechanism for performing massage on a message target area of user's body;
 - a second massaging mechanism for effecting different message from that produced by said first massaging mechanism;
 - and
 - a power transmission mechanism for enabling transmission of the rotatably driving force of said driving section to said first massaging mechanism and said second massaging mechanism, said power transmission mechanism being designed so that, when said driving section is operated to produce a rotatably driving force for rotation in a normal direction, the rotatably driving force is transmitted to both of the first massaging mechanism and the second massaging mechanism, whereas, when said driving section is operated to produce a rotatably driving force for rotation in a reverse direction, power is transmitted to said first massaging mechanism alone.
2. The massaging apparatus according to claim 1,
 - wherein said first massaging mechanism is a kneading message mechanism for performing kneading message on said message target area of user's body,

and wherein said second massaging mechanism is a tapping message mechanism for performing tapping message on said message target area of user's body

3. The massaging apparatus according to claim 2,
wherein said driving section comprises a single driving motor.

4. The massaging apparatus according to claim 3,
wherein said driving motor is a double-shaft motor having a one end-side driving shaft and an other end-side driving shaft,
and wherein said power transmission mechanism comprises:
a kneading rotation shaft coupled to said one end-side driving shaft, for transmitting a rotatably driving force of said one end-side driving shaft to the kneading message mechanism;
a tapping rotation shaft coupled to said other end-side driving shaft, for transmitting a rotatably driving force of said other end-side driving shaft to the tapping message mechanism; and

a clutch member disposed at said tapping rotation shaft, for effecting switching between execution and nonexecution of rotatably driving force transmission depending on a direction of rotation of said other end-side driving shaft.

5. The massaging apparatus according to claim 4,

wherein said clutch member is constructed of a one-way clutch which effects transmission of a rotatably driving force to said tapping rotation shaft on rotation of said other end-side driving shaft in a normal direction, and restrains transmission of a rotatably driving force to said tapping rotation shaft on rotation of said other end-side driving shaft in a reverse direction.

6. The massaging apparatus according to claim 4 or claim 5, wherein said kneading message mechanism comprises:

an inclined boss member attached to said kneading rotation shaft, with its inclined cam face inclined with respect to an axis of said kneading rotation shaft;

an annular fit portion which is slidably fitted to the inclined cam face of said inclined boss member;

a kneading arm member which is provided at its basal end with said annular fit portion, and has its front end extended radially outwardly;

a kneading massager disposed at the front end of said kneading arm member; and

a restraint member for restraining said kneading arm member from rotating in accompanying relation with the kneading rotation shaft.

7. The massaging apparatus according to claim 6,

wherein said kneading rotation shaft is provided with a grabbing massager member having a grabbing massager which moves close to and away from the kneading massager of said kneading massager member.

8. The massaging apparatus according to claim 7,

wherein said tapping massager mechanism comprises:

an engagement piece disposed on a side of the tapping massager mechanism opposite said kneading massager, with the axis of said kneading rotation shaft lying between the engagement piece and the kneading massager;

a tapping boss member attached to said tapping rotation shaft for eccentric rotation with respect to the axis of the tapping rotation shaft; and

a coupling shaft which is rotatably fitted to an outer periphery of said tapping boss member at one end, and is coupled to said engagement piece at the other end via a universal joint.