

DESCRIPTION

Title of Invention: MESSAGE DEVICE

Technical Field

[0001] The present invention relates to a message device that produces a message effect by vibration on user's body part to be treated, e.g. the foot.

Background Art

[0002] Message devices configured to massage user's body part to be treated, e.g. the shoulder by vibration of a massaging portion have been put on the market. Such a message device is designed as a hand-carriable massager. For example, the one disclosed in Patent Literature 1 is capable of applying effective message to user's shoulder, etc. Specifically, Patent Literature 1 discloses a compact message device comprising a case provided at its base end side with a grip portion, a massaging portion projecting through an opening formed in the tip side of the case, a movable kneading body including an arm portion formed integrally with the massaging portion on the base end side of the massaging portion, a vibratory massaging portion projecting through an opening formed in the tip side of the case, a stationary kneading body including a vibrating mechanism that vibrates the vibratory massaging portion by a rotational force exerted by a drive motor, and a drive mechanism that moves the movable kneading body toward and away from the stationary kneading

body.

Prior Art Reference

Citation List

[0003] Patent Literature 1: Japanese Unexamined Patent
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Summary of Invention

Technical Problem

[0004] In addition to the hand-carriable massager configured to massage user's shoulder by vibration of the massaging portion as disclosed in Patent Literature 1, a cylindrically shaped (roll-shaped) massage device configured to apply vibratory massage to user's sole, etc. when set on a floor surface or other area (<https://www.dr-air.com/jp/ja/products/3d-massage-roll/>) has also been put on the market. This roll-shaped massage device has a built-in vibration-generating mechanism.

[0005] Specifically, for example, with the roll-shaped massage device set on a floor surface or other area, the user sitting in a chair puts the foot on the massage device, and the device then operates to apply vibratory massage to the sole, etc. Moreover, when the user sitting in a chair places the roll-shaped massage device on the thigh, the massage device operates to apply vibratory massage to the thigh.

However, the roll-shaped massage device known in the art generates vibration by the rotation of a weight portion (i.e.

eccentric body) attached to the rotating shaft of a drive motor. Therefore, for example, when such a roll-shaped massage device is set on a floor surface or other area in use, the entire device vibrates greatly at turn-on, and the resulting vibration is transmitted to the floor surface or other area. This may cause the device to move in an unexpected direction before the user places the foot on the device main body. That is, the user finds it difficult to know the right time to turn the power ON and may therefore fail to have massage at the desired location, which makes the roll-shaped massage device hard to handle.

[0006] Furthermore, when the user places the roll-shaped massage device on the thigh, the device is held at its ends with user's hands during use. In this case, the vibration of the device causes numbness or itchiness in the hands, which leads to unsatisfactory massage treatment.

In view of the problems as discussed supra, an object of the present invention is to provide a massage device that produces a massage effect by vibration on user's body part to be treated, the massage device comprising a non-vibrating section to which no vibration is transmitted, and thus performing massage in a predetermined location without vibration being transmitted to a floor surface or other area where the massage device is placed.

Solution to Problem

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

A massage device embodying the present invention comprises: a vibrating section that applies massage by vibration to a treatment part, and has a roll form; and a non-vibrating section, disposed on each of opposite sides of the vibrating section, to which the vibration is not transmitted.

In the present invention, it is preferable that the massage device comprises: a vibration-generating mechanism configured to apply vibratory massage to the treatment part; a base body that accommodates the vibration-generating mechanism; a cylindrically shaped cover body which circumferentially surrounds the base body, has a surface provided with a treatment element, and is vibrated by the vibration-generating mechanism; and a grip section disposed at each of longitudinal ends of the cover body, the cover body serving as the vibrating section, the grip section being mounted in non-connecting relation to the cover body, and serving as the non-vibrating section to which vibration from the vibration-generating mechanism is not transmitted.

[0008] In the present invention, it is preferable that the grip section has an outside diameter greater than an outside diameter of the cover body, and that the grip section has an outer periphery provided with a placement portion placeable on a floor surface.

In the present invention, it is preferable that the placement portion is configured to prevent, upon placing of the

massage device on the floor surface, the massage device from rolling thereon.

In the present invention, it is preferable that the grip section is retained in a loose fit by a retaining portion.

[0009] In the present invention, it is preferable that the retaining portion comprises a cylindrically shaped boss member fitted over an annular fit portion of the grip section, a cylindrically shaped retaining member that retains the boss member in a loose fit, and a ring member, fastened to the retaining member, for preventing the boss member from coming off.

In the present invention, it is preferable that the retaining member has an outside diameter smaller than an inside diameter of the boss member.

In the present invention, it is preferable that the grip section is mounted in non-connecting relation to the cover body, with the boss member retained in a loose fit by the retaining member and the ring member.

[0010] In the present invention, it is preferable that the retaining member is attached to the base body so as to be retained in a suspended fashion within the cover body, and is thus not subject to vibration transmitted to the cover body from the vibration-generating mechanism.

In the present invention, it is preferable that the vibration-generating mechanism comprises a drive motor that produces a rotational driving force, a converting member that

converts the rotational driving force into vibrational motion, and a vibrating element disposed on the converting member, and that the cover body is coupled via the vibrating element to the converting member.

[0011] In the present invention, it is preferable that the converting member is attached via an elastic member to the base body.

In the present invention, it is preferable that the drive motor has an output shaft provided with a boss member having an axis of rotation which is eccentric with respect to the output shaft, that the vibration-generating mechanism produces vibration by the eccentricity of the boss member with respect to the output shaft of the drive motor, and that the boss member is fitted with a weight portion that prevents the vibration from being transmitted toward the drive motor.

Advantageous Effects of Invention

[0012] The present invention provides a massage device that produces a massage effect by vibration on a treatment part, the massage device comprising a non-vibrating section to which no vibration is transmitted, and thus performing massage in a predetermined location without vibration being transmitted to a floor surface or other area where the massage device is placed.

Brief Description of Drawings

[0013]

FIG. 1 is a general schematic view of a massage device

embodying the present invention.

FIG. 2 is an internal view of the massage device embodying the present invention, schematically illustrating a grip section, an intermediate cylindrical body, a vibrating element of a vibration-generating mechanism, etc. (for example, positional relationship among these components).

FIG. 3 is an internal view of the massage device embodying the present invention, schematically illustrating the grip section, a retaining portion, the vibration-generating mechanism, etc. (for example, positional relationship among these components).

FIG. 4 is an exploded view of the vibration-generating mechanism.

FIG. 5 is an exploded view of the retaining portion for retaining the grip section in a loose fit.

FIG. 6 is a sectional view of the massage device embodying the present invention (first-side vibration-generating portion).

FIG. 7 is a schematic diagram of the retaining portion, illustrating an area A shown in FIG. 6 in enlarged dimension.

FIG. 8 is a view showing how the massage device embodying the present invention is to be used.

Description of Embodiments

[0014] An embodiment of a massage device 1 pursuant to the present invention will now be described with reference to the

drawings.

The following embodiment is given by way of example of carrying the present invention into effect, and is thus not intended to be limiting of the structural features of the present invention. Moreover, in the drawings, some constituent components are not shown, and imaginary lines, etc. are used to indicate certain components for clarity of illustration. For the orientation, etc. of the massage device 1, for example, one side of the massage device 1 corresponding to the left side of the FIG. 1-bearing sheet is referred to as a "first side", and the other side of the massage device 1 corresponding to the right side of the sheet is referred to as a "second side". The same goes for the orientation of the massage device 1 shown in FIGS. 2 to 8.

[0015] As shown in FIGS. 1 to 8, the massage device 1 embodying the present invention is configured to apply vibratory massage to user's body part to be treated, being simply called treatment part, such as foot T, thigh, and waist.

For example, with the massage device 1 embodying the present invention set on a floor surface F or other area, the user sitting in a chair places the foot T on the massage device 1. In this condition, the massage device 1 applies vibratory massage to user's sole, etc. (refer to FIG. 8).

[0016] Moreover, while not shown in the drawings, when the user sitting in a chair places the massage device 1 embodying

the present invention on the thigh, the massage device 1, being supported by user's hands, applies vibratory massage to the thigh, and also, when the user sitting in a chair places the massage device 1 between the waist and the backrest of the chair, the massage device 1 applies vibratory massage to the waist.

[0017] The following describes the specifics of the massage device 1 embodying the present invention.

The massage device 1 embodying the present invention is characterized by comprising a "vibrating section" that applies massage by vibration to a treatment part and has a roll form, and a "non-vibrating section", disposed on each of the opposite sides of the vibrating section, to which the vibration is not transmitted.

The massage device 1 embodying the present invention comprises: a vibration-generating mechanism 2 configured to apply vibratory massage to a treatment part; a base body 3 that accommodates the vibration-generating mechanism 2; a cylindrically shaped intermediate cylindrical body 4 which circumferentially surrounds the base body 3, and is vibrated by the vibration-generating mechanism 2; a cylindrically shaped cover body 5 which fits onto the intermediate cylindrical body 4, and has a surface provided with a treatment element 6; and a grip section 7 disposed at each of the longitudinal ends of the cover body 5. That is, the massage device 1 embodying the present invention is designed as a roll-shaped vibratory

massager.

[0018] The massage device 1 according to this embodiment includes the intermediate cylindrical body 4. The intermediate cylindrical body 4 serves also as a member constituting the cover body 5. That is, the cover body 5 according to this embodiment has a structure combining the cover body 5 in itself and the intermediate cylindrical body 4 (i.e. double-layer structure). Alternatively, for example, the cover body 5 may be provided alone as a single-layer construction.

As shown in FIGs. 3 and 4, the vibration-generating mechanism 2 comprises: a drive motor 8 that produces a rotational driving force; a converting member 9 that converts the rotational driving force into vibrational motion; and a vibrating element 10 disposed on the converting member 9.

[0019] The drive motor 8 includes a first-side output shaft 12a protruding toward the first side from a main body 11, and a second-side output shaft 12b protruding toward the second side from the main body 11. That is, the drive motor 8 is a double-axis, or dual-axis drive motor. The drive motor 8 according to this embodiment produces output of rotational driving force to the first side and the second side via the first-side output shaft 12a and the second-side output shaft 12b, respectively.

[0020] In this embodiment, the first-side output shaft 12a side is referred to as a first-side vibration-generating portion 2a, and the second-side output shaft 12b side is referred to

as a second-side vibration-generating portion 2b. The first-side vibration-generating portion 2a and the second-side vibration-generating portion 2b are symmetrically arranged in a longitudinal direction (i.e. a direction parallel to an axis extending across the first side and the second side). In other words, the first-side vibration-generating portion 2a is arranged in mirror image fashion and in spaced relation to the second-side vibration-generating portion 2b in the longitudinal direction. Moreover, the first-side vibration-generating portion 2a and the second-side vibration-generating portion 2b are disposed adjacent each other, with the drive motor 8 lying between them.

[0021] The first-side vibration-generating portion 2a will first be described in detail.

The first-side output shaft 12a is provided at its tip with a boss member 13a. The boss member 13a is a substantially cylindrically shaped member. In this embodiment, the boss member 13a has a semicylindrical shape.

As shown in FIG. 5, the boss member 13a comprises: a cylindrical portion 14a mounted with its axis directed toward the first side; a plate member 14c overhanging in flange form from the cylindrical portion 14a; and a weight portion 14b attached to the plate member 14c.

[0022] The boss member 13a is provided at its side opposite the cylindrical portion 14a in a horizontal direction with a

hole 14d in which the first-side output shaft 12a is fitted. The boss member 13a eccentrically rotates for generation of vibration due to the eccentricity of the central axis of the cylindrical portion 14a.

The cylindrical portion 14a protrudes from the first-side wall of the plate member 14c. The cylindrical portion 14a is disposed with its axis L2 directed in the same direction as the axis L1 of the first-side output shaft 12a, but not disposed in axial alignment with the first-side output shaft 12a. That is, the cylindrical portion 14a eccentrically rotates with the rotation of the first-side output shaft 12a. As the cylindrical portion 14a eccentrically rotates relative to the first-side output shaft 12a, a converting member 9a converts the rotational motion into vibrational motion.

[0023] While the weight, shape, etc. of the weight portion 14b may be changed as needed, the weight portion 14b is positioned opposite (i.e. disposed at a position counter to) the axis of the eccentrically rotatable cylindrical portion 14a with respect to the axis of the first-side output shaft 12a. That is, the weight portion 14b is disposed at a diametrically opposed position to the axis of the cylindrical portion 14a.

The cylindrical portion 14a on the first side and a cylindrical portion of a boss member 13b on the second side (not shown) are positioned in axial alignment with each other. Thus, the cylindrical portion 14a on the first side and the cylindrical

portion of the boss member 13b on the second side do not rotate differently from each other, and more specifically neither rotate behind each other by 90 degrees nor rotate in opposite directions, for example. That is, the first-side boss member 13a and the second-side boss member 13b are eccentric in the same direction.

[0024] Moreover, the weight portion 14b on the first side and a weight portion of the second-side boss member 13b (not shown) are oriented in the same direction. For example, given that the weight portion 14b on the first side takes an upper position, then the weight portion of the second-side boss member 13b also takes an upper position.

Next, the workings of the cylindrical portion 14a and the weight portion 14b will be described.

The cylindrical portion 14a is eccentrically rotated by the rotational driving force outputted from the first-side output shaft 12a. Upon the eccentric rotation of the cylindrical portion 14a, the rotational motion is transmitted to the converting member 9a on the first side. The converting member 9a converts the rotational motion into vibrational motion. The vibrational motion resulting from the conversion by the converting member 9a is likely to be transmitted toward the main body 11 of the drive motor 8.

[0025] At this time, without the weight portion 14b being located toward the eccentrically rotatable cylindrical portion 14a, the vibration is not canceled but is transmitted to the

main body 11 side, causing the entire massage device 1 to vibrate greatly. This may result in the rolling of the massage device 1 in an unexpected direction.

In order to prevent the described phenomenon, in this embodiment, the weight portion 14b is located toward the cylindrical portion 14a. The weight portion 14b rotates about the axis of the cylindrical portion 14a under the eccentric rotation of the cylindrical portion 14a. The rotation of the weight portion 14b cancels the vibration which is transmitted toward the main body 11, thereby reducing the transmission of the vibration.

[0026] The boss member 13a according to this embodiment reduces the transmission of vibration resulting from the conversion by the converting member 9a to the main body 11 of the drive motor 8, and consequently the vibrational motion resulting from the conversion by the converting member 9a is hardly transmitted to a grip section 7a. Thus, the grip section 7a becomes the non-vibrating section, and, the component serving as the vibrating section is limited to the cover body 5 including the treatment element 6. With this arrangement provided in the massage device 1, the user is able to carry the massage device 1 easily by the grip section 7.

[0027] The boss member 13a is provided at its first-side end (i.e. the cylindrical portion 14) with the converting member 9a. The converting member 9a according to this embodiment is

cross-shaped. Specifically, the converting member 9a includes four projecting pieces 15a disposed in crisscross arrangement.

A space between the individual projecting pieces 15a allows the passage of a coupling member 39 (detailed later) for coupling together a base body 3a and a retaining portion 31 on the first side (detailed later). The projecting piece 15a is provided intermediate its ends in the projecting direction with a hole 16a.

[0028] As shown in FIG. 5, the hole 16a receives therein with a fit a restraining shaft portion 21 (detailed later) provided in the base body 3a. In this embodiment, opposed two out of the four projecting pieces 15a are each formed with the hole 16a. Fitting the restraining shaft portion 21 of the base body 3a in the hole 16a restrains the converting member 9a from rotation. In other words, the hole 16a and the restraining shaft portion 21 constitute a "rotation-restraining portion" for restraining the rotation of the converting member 9a to a predetermined extent.

[0029] The projecting piece 15a is provided at its tip with a vibrating element 10a. In this embodiment, the vibrating element 10a is a projecting piece which is rectangular in plan configuration. The vibrating element 10a is fitted in a rectangular fit hole 25a (detailed later) formed in the intermediate cylindrical body 4.

Moreover, the converting member 9a is formed with a

centrally located hole 17 which is axially identical with the cylindrical portion 14. A bearing 18 is fitted in the hole 17. The converting member 9a is rotatably attached via the bearing 18 to the cylindrical portion 14 (i.e. the boss member 13a).

[0030] The thickness of the converting member 9a (i.e. the depth of the hole 17) is substantially equal to the height of the cylindrical portion 14. Moreover, the height of the converting member 9a (i.e. the distance from the tip of one projecting piece 15a to the tip of the opposite projecting piece 15a) is substantially equal to the inside diameter of the intermediate cylindrical body 4. In this embodiment, the converting member 9a is about 75 mm in height.

The converting member 9a is attached via an elastic member 19 to the base body 3a. Specifically, the elastic member 19 is a substantially cylindrically shaped member fitted onto the restraining shaft portion 21 of the base body 3a. The elastic member 19 is preferably made of a flexible material (e.g. a rubber bushing member). The elastic member 19 reduces the transmission of vibration to other members by absorbing the rotation of the converting member 9a, and thereby protects the massage device 1 from damage.

[0031] While the converting member 9a is rotated by the rotational driving force transmitted thereto from the drive motor 8 via the boss member 13a, with the restraining shaft portion 21 of the base body 3a fitted in the hole 16a, the rotation is

restrained to the predetermined extent, thereby enabling conversion into vibration. With the vibrating element 10a of the converting member 9a fitted in the fit hole 25a, the converting member 9a causes the intermediate cylindrical body 4 to vibrate.

[0032] As described earlier, the second-side vibration-generating portion 2b according to this embodiment is arranged in mirror image fashion to the first-side vibration-generating portion 2a. That is, since the second-side vibration-generating portion 2b has substantially the same form as the first-side vibration-generating portion 2a, only the general structural features of the second-side vibration-generating portion 2b will be described below.

The second-side output shaft 12b is provided at its tip with the boss member 13b. While not shown in the drawings, the boss member 13a is provided with a protruded cylindrical portion in which the second-side output shaft 12b is fitted. The boss member 13b may be mounted for eccentric rotation.

[0033] The boss member 13b is provided at its tip with a converting member 9b. The converting member 9b according to this embodiment is cross-shaped. That is, the converting member 9b includes four projecting pieces 15b disposed in crisscross arrangement.

The projecting piece 15b is provided intermediate its ends in the projecting direction with a hole 16b in which is fitted a restraining shaft portion 23 (detailed later) attached to a

base body 3b. As with the holes 16a of the converting member 9a, two holes 16b are provided in the converting member 9b. Fitting the restraining shaft portion 23 of the base body 3b in the hole 16b restrains the converting member 9b from rotation. In other words, the hole 16b and the restraining shaft portion 23 constitute a "rotation-restraining portion" for restraining the rotation of the converting member 9b to a predetermined extent.

[0034] The projecting piece 15b is provided at its tip with a vibrating element 10b. In this embodiment, the vibrating element 10b is identical in form to the vibrating element 10a. The vibrating element 10b is fitted in a rectangular fit hole 25b formed in the intermediate cylindrical body 4.

Moreover, the converting member 9b is formed with a centrally located hole (not shown) in which a bearing is fitted. The converting member 9b is rotatably attached via the bearing (not shown) to the boss member 13b.

[0035] That is, the converting member 9b is identical in form to the converting member 9a. Moreover, the converting member 9b is attached via an elastic member 19 to the base body 3b. Specifically, the elastic member 19 is fitted onto the restraining shaft portion 23 of the base body 3b. The elastic member 19 reduces the transmission of vibration to other members by absorbing the rotation of the converting member 9b, and thereby protects the massage device 1 from damage.

[0036] While the converting member 9b is rotated by the rotational driving force transmitted thereto from the drive motor 8 via the boss member 13b, with the restraining shaft portion 23 of the base body 3b fitted in the hole 16b, the rotation is restrained to the predetermined extent, thereby enabling conversion into vibration. With the vibrating element 10b of the converting member 9b fitted in the fit hole 25b, the converting member 9b causes the intermediate cylindrical body 4 to vibrate.

[0037] As shown in FIG. 4, the base body 3 is attached to the main body 11 of the drive motor 8. Specifically, the base body 3a is attached to the first-side wall of the main body 11. On the other hand, the base body 3b is attached to the second-side wall of the main body 11.

The base body 3a will first be described in detail.

The base body 3a is a member shaped in a circular plate having a predetermined thickness. The outside diameter of the base body 3a is substantially equal to the outside diameter of the main body 11 of the drive motor 8. The base body 3a is formed with a centrally located hole 20 oriented in the same direction as the axis of the circular plate form. The hole 20 of the base body 3a is a through hole that receives therethrough the first-side output shaft 12a.

[0038] The base body 3a is provided at its outer periphery wall with the restraining shaft portion 21. There are provided two restraining shaft portions 21 that face toward the first

side, and are arranged in a one-to-one correspondence with the holes 16a of the converting member 9a. That is, the restraining shaft portions 21, taken as a pair, are located in opposed positions with respect to the first-side output shaft 12a. The elastic member 19 is attached to each of the restraining shaft portions 21.

Moreover, the base body 3a is provided at its outer periphery wall with an engagement piece 22. The engagement piece 22 is a plate piece extending toward the first side. The engagement piece 22 has a longitudinal length greater than the thickness of the base body 3a. That is, the engagement piece 22 protrudes from the base body 3a.

[0039] In this embodiment, there are provided four engagement pieces 22 arranged equidistantly on the outer periphery wall of the base body 3a. The engagement piece 22 is a member for engagement with the coupling member 39 (detailed later) mounted for passage through the space between the individual projecting pieces 15a of the converting member 9a.

Since the base body 3b is a member having substantially the same form as the base body 3a, only the general structural features of the base body 3b will be described below.

[0040] While not shown in the drawings, the base body 3b is formed with a centrally located hole that receives therethrough the second-side output shaft 12b. The base body 3b is provided at its outer periphery wall with the restraining shaft portion

23. There are provided two restraining shaft portions 23 that are located in opposed positions with respect to the second-side output shaft 12b, and arranged in a one-to-one correspondence with the holes 16b of the converting member 9b. The elastic member 19 is attached to each of the restraining shaft portions 23.

[0041] Moreover, the base body 3b is provided at its outer periphery wall with an engagement piece 24. The engagement piece 24 is a plate piece extending toward the first side. In this embodiment, there are provided four engagement pieces 24 arranged equidistantly on the outer periphery wall of the base body 3b. That is, the engagement piece 24 is a member for engagement with the coupling member 39 mounted for passage through a space between the individual projecting pieces 15b of the converting member 9b.

[0042] As shown in FIG. 2, the intermediate cylindrical body 4 is a longitudinally elongated cylindrical member. The intermediate cylindrical body 4 has a large interior space for the storage of the vibration-generating mechanism 2. The intermediate cylindrical body 4 is provided at its outer periphery wall with a plurality of fit holes 25. Specifically, four fit holes 25a are provided in the outer periphery wall of the intermediate cylindrical body 4 on the first side.

The fit hole 25a is rectangular in plan configuration. The vibrating element 10a of the converting member 9a is fitted

in the fit hole 25a. That is, the fit hole 25a has substantially the same size as the vibrating element 10a.

[0043] Moreover, four fit holes 25b are provided in the outer periphery wall of the intermediate cylindrical body 4 on the second side. The fit hole 25b is rectangular in plan configuration. The vibrating element 10b of the converting member 9b is fitted in the fit hole 25b. That is, the fit hole 25b has substantially the same size as the vibrating element 10b.

The intermediate cylindrical body 4 is coupled via the vibrating element 10 fitted in the fit hole 25 to the converting member 9. The vibration of the vibrating element 10 resulting from the conversion by the converting member 9 causes the intermediate cylindrical body 4 to vibrate. In this embodiment, the intermediate cylindrical body 4 is about 300 mm in length, about 80 mm in outside diameter, and about 75 mm in inside diameter.

[0044] As shown in FIG. 1, the cover body 5 is a cylindrically shaped member which is substantially equal in longitudinal length to the intermediate cylindrical body 4. The cover body 5 has a large interior space, and fits onto the intermediate cylindrical body 4. The cover body 5 is provided at its outer periphery wall with a plurality of treatment elements 6.

Specifically, the treatment element 6 extends radially outwardly in protuberance form. A plurality of the treatment elements 6 are regularly spaced in the direction of the length

of the cover body 5. The form (i.e. the height, width, etc.) of the treatment element 6 may be changed to suit intended purposes of massage treatment.

[0045] As shown in FIG. 6, in this embodiment, the cover body 5 has a double-layer structure consisting of an outer cylinder 5a and an inner cylinder 5b. For example, the outer cylinder 5a is preferably constructed of a member made of a soft and flexible material (e.g. rubber). The outer cylinder 5a avoids causing user discomfort such as sudden pain when the user presses the massage device against a treatment part. The inner cylinder 5b is a member which fits onto the intermediate cylindrical body 4. For example, the inner cylinder 5b is preferably made of a hard and rigid material.

[0046] The cover body 5 (i.e. the outer cylinder 5a and the inner cylinder 5b) is mounted in intimate contact with the intermediate cylindrical body 4. Thus, upon the vibration of the intermediate cylindrical body 4 caused by the vibration of the vibrating element 10, the cover body 5 vibrates together with the intermediate cylindrical body 4. That is, the intermediate cylindrical body 4 and the cover body 5 constitute the "vibrating section".

In this embodiment, the cover body 5 has a length of about 300 mm (substantially equal to the length of the intermediate cylindrical body 4), an outside diameter of about 100 mm (inclusive of the height dimension of the treatment element 6),

and an inside diameter of about 80 mm (substantially equal to the outside diameter of the intermediate cylindrical body 4).

[0047] The cover body 5 is provided at its ends with the grip section 7. Specifically, a grip section 7a is disposed at the first-side end of the cover body 5, and a grip section 7b is disposed at the second-side end of the cover body 5.

The grip section 7a and the grip section 7b are arranged in mirror image fashion and in spaced relation to each other (i.e. symmetrically arranged) in the longitudinal direction. The grip section 7a and the grip section 7b are disposed adjacent each other, with the cover body 5 lying between them. The following description mainly focuses on the grip section 7a.

[0048] As shown in FIG. 5, the grip section 7a is a substantially discotic member. The grip section 7a is greater in outside diameter than the cover body 5. The grip section 7a has a centrally located annular fit portion 26 formed therethrough in a direction axially of the discotic form. The annular fit portion 26 fits onto a boss member 32a (detailed later) constituting a retaining portion 31a.

In this embodiment, the grip section 7a is provided at its outer periphery with a recess 27. The recess 27 is concavely, or inwardly curved in a direction radially of the grip section 7a. More specifically, the outer periphery of the grip section 7a is defined by alternate projections 28 and recesses 27 (i.e. alternate convexities and concavities). The grip section 7a

is a substantially discotic member having a starlike plan configuration. In this embodiment, the projection 28 has a curved or substantially flat apex (i.e. blunt tip).

[0049] The projection 28 includes a plurality of edges. Of these edges, longitudinally oriented (i.e. first side-facing) rectilinear edges 29 constitute a placement portion 30 placeable on a floor surface F. Specifically, the placement portion 30 is constituted by a pair of an edge 29a of the projection 28 and an edge 29b opposed through the recess 27 to the edge 29a. When brought into contact with the floor surface F, the rectilinear edges 29a and 29b provide the placement portion 30 that enables the grip section 7 to be placed on the floor surface F.

[0050] In other words, the grip section 7 is provided at its outer periphery with the placement portion 30 placeable on the floor surface F. The placement portion 30 is configured to prevent, upon placing of the massage device 1 on the floor surface F, the massage device 1 from rolling thereon. Expressed differently, the placement portion 30 comprises a "roll-preventing portion".

While the placement portion 30 is constituted by the edges 29a and 29b of the projections 28 in this embodiment, a flat face obtained by cutting part of the outer periphery of the grip section 7 (e.g. an oblique side of a polygon such as a pentagon defining the periphery contour) may constitute the placement

portion 30 placeable on the floor surface F. The grip section 7 is retained in a loose fit by the retaining portion 31.

[0051] As shown in FIGs. 5 to 7, the retaining portion 31 comprises: a cylindrically shaped boss member 32 fitted over the annular fit portion 26 of the grip section 7; a cylindrically shaped retaining member 33 that retains the boss member 32 in a loose fit; and a ring member 34, fastened to the retaining member 33, for preventing the boss member 32 from coming off.

The retaining portion 31a is located toward the grip section 7a. Moreover, a retaining portion 31b is located toward the grip section 7b. The retaining portion 31a and the retaining portion 31b are arranged in mirror image fashion and in spaced relation to each other (i.e. symmetrically arranged) in the longitudinal direction. The retaining portion 31a and the retaining portion 31b are disposed adjacent each other, with the vibration-generating mechanism 2 lying between them. The following description mainly focuses on the retaining portion 31a.

The retaining portion 31a is located outwardly of the first-side vibration-generating portion 2a in a direction toward the first side.

[0052] The boss member 32a is a cylindrically shaped member which is fitted in the annular fit portion 26 of the grip section 7a. The boss member 32a is opened at one end (i.e. outward end in the direction toward the first side) to provide a wide opening,

and is provided at the other end (i.e. inward end in the same direction) with a bottom plate 35. That is, the boss member 32a is a cylindrical member having a closed bottom.

The bottom plate 35 is formed with a centrally located hole 36 oriented in the same direction as the axis of the cylindrical form. The hole 36 is a through hole that receives therethrough a retaining member 33a. That is, the bottom plate 35 is an annular plate member.

[0053] The hole 36 formed in the bottom plate 35 is a stepped through hole with varying inside diameters. The hole 36 comprises, in first side-to-second side order, a hole 36a, a hole 36b, and a hole 36c that differ in inside diameter from one another.

First, an inside diameter ϕA of the hole 36a is slightly greater than an outside diameter ϕG of an annular rib member 42 protruding toward the second side from a ring member 34a, which will hereafter be described (refer to FIGs. 6 and 7).

[0054] An inside diameter ϕB of the hole 36b is slightly greater than an outside diameter ϕD of a cylinder portion of a retaining member 33a, which will hereafter be described (refer to FIGs. 6 and 7).

An inside diameter ϕC of the hole 36c is slightly greater than an outside diameter ϕE of a rib member 37 formed on the retaining member 33a, which will hereafter be described (refer to FIGs. 6 and 7).

The retaining member 33a is a cylindrically shaped member. The outside diameter of the retaining member 33a is smaller than the inside diameter of the boss member 32a. Specifically, the outside diameter ϕD of the cylinder portion of the retaining member 33a is smaller than the inside diameter ϕB of the hole 36b formed in the bottom plate 35 of the boss member 32a (refer to FIGs. 6 and 7).

[0055] The retaining member 33a is provided at its outer periphery wall with the rib member 37. The rib member 37 protrudes radially outwardly, and is arced (or annularly extends) in a circumferential direction. That is, the rib member 37 is formed so as to extend around the outer periphery of the retaining member 33a.

In this embodiment, there are provided four rib members 37 arranged equidistantly on the outer periphery wall of the retaining member 33a. Alternatively, the rib member 37 may be formed so as to annularly extend circumferentially on the outer periphery of the retaining member 33a.

[0056] The outside diameter ϕE of the rib member 37 is smaller than the inside diameter ϕC of the hole 36c formed in the bottom plate 35 (i.e. the boss member 32a) (refer to FIGs. 6 and 7). Thus constructed, the retaining member 33a rotatably supports the boss member 32a in a loose fit.

Moreover, the retaining member 33a is provided at its outer periphery wall with an engagement piece 38. The engagement piece

38 is located closer to the second side than the rib member 37. The engagement piece 38 is a plate piece protruding toward the second side from the retaining member 33a.

[0057] In this embodiment, there are provided four engagement pieces 38 arranged equidistantly on the outer periphery wall of the base body 3a. Each of the engagement pieces 38 is positioned face to face with the corresponding engagement piece 22 of the base body 3a. The engagement piece 38 is a member for engagement with the coupling member 39 which passes through the space between the individual projecting pieces 15a of the converting member 9a.

The coupling member 39 is a member for coupling the retaining member 33a and the base body 3a together. The coupling member 39 is an elongate rodlike member formed with a longitudinally elongated groove 40. The coupling member 39 is mounted, with the groove 40 engaged with the protruding engagement piece 22 (i.e. the base body 3a), by using a fastening tool, etc. Moreover, the coupling member 39 is mounted, with the groove 40 engaged with the protruding engagement piece 38 (i.e. the retaining member 33a) positioned face to face with the engagement piece 22, by using a fastening tool, etc.

[0058] That is, the coupling member 39 is disposed so as to span the region between the retaining member 33a and the base body 3a. This arrangement enables the coupling member 39 to securely couple the retaining member 33a and the base body 3a

together.

Between the retaining member 33a and the base body 3a is disposed the cross-shaped converting member 9a in an isolated fashion. Moreover, the projecting piece 15a of the converting member 9a protrudes radially outwardly through the space between adjacent coupling members 39. The projecting piece 15a is rocked within the range of the space between the adjacent coupling members 39.

[0059] Together with the retaining member 33a, the ring member 34a retains in sandwich relation the boss member 32a in a loose fit. The ring member 34a is inserted inside the boss member 32a, and is attached to the retaining member 33a with a fastening tool, etc.

The ring member 34a is a cylindrically shaped member opened at one end (i.e. outward end in the direction toward the first side) to provide a wide opening, and is provided at the other end (i.e. inward end in the same direction) with a bottom plate 41. That is, the ring member 34a is a cylindrical member having a closed bottom.

The bottom plate 41 is formed with a centrally located through hole.

[0060] The outside diameter of the ring member 34a is smaller than the inside diameter of the boss member 32a (refer to FIGs. 6 and 7).

The bottom plate 41 is provided at its bottom facing toward

the second side with a rib member 42. The rib member 42 protrudes toward the second side, and is circumferentially curved (i.e. annularly shaped). That is, the rib member 42 is formed so as to extend circumferentially.

An inside diameter ϕF of the rib member 42 is greater than the outside diameter ϕD of the cylinder portion of the retaining member 33a (refer to FIGs. 6 and 7). The rib member 42 fits onto the retaining member 33a. The ring member 34a and the retaining member 33a are secured to each other with a fastening tool, etc.

[0061] The outside diameter ϕG of the rib member 42 is smaller than the inside diameter ϕA of the hole 36a formed in the bottom plate 35 (i.e. the boss member 32a) (refer to FIGs. 6 and 7).

Thus, the ring member 34a is disposed toward the second side for attachment to the retaining member 33a, with the boss member 32a held in between, and rotatably retains the boss member 32a in a loose fit without causing backlash.

[0062] The ring member 34a is provided at its opening facing toward the first side with a lid member 43. The lid member 43 is shaped in a circular plate. The lid member 43 and the ring member 34a have substantially the same outside diameter.

Moreover, the lid member 43 is provided with operating switches 44, including a power switch to start and stop the operation of the massage device 1, and a setting change button for changing vibration rhythm.

[0063] As described above, the retaining portion 31b is located toward the grip section 7b. The retaining portion 31b according to this embodiment is arranged in mirror image fashion to the retaining portion 31a. That is, since the retaining portion 31b has substantially the same form as the retaining portion 31a, only the general structural features of the retaining portion 31b will be described below.

A boss member 32b is a cylindrically shaped member which is fitted in the grip section 7b. The boss member 32b is opened at one end (i.e. outward end in the direction toward the second side) to provide a wide opening, and is provided at the other end (i.e. inward end in the same direction) with a bottom plate 45. That is, the boss member 32b is a cylindrical member having a closed bottom. The bottom plate 45 is formed with a through hole 46 that receives therethrough a retaining member 33b.

[0064] The hole 46 formed in the boss member 32b is, like the hole 36 of the boss member 32a, a stepped through hole with varying inside diameters. Each of the holes of the hole 46 formed in the boss member 32b has substantially the same inside diameter as the corresponding one of the hole 36a, the hole 36b, and the hole 36c of the boss member 32a.

The retaining member 33b is a cylindrically shaped member. The outside diameter of the retaining member 33b is substantially equal to the outside diameter of the retaining member 33a. That is, the outside diameter of the retaining member 33b is smaller

than the inside diameter of the hole 36b.

[0065] The retaining member 33b is provided at its outer periphery wall with a rib member 47. The rib member 47 is similar in form to the rib member 37 of the retaining member 33a. That is, the rib member 47 is formed so as to extend circumferentially on the outer periphery of the retaining member 33b.

The outside diameter of the rib member 47 is smaller than the inside diameter of the hole 46 formed in the boss member 32b (i.e. the inside diameter of the hole 36c). Thus constructed, the retaining member 33b rotatably supports the boss member 32b in a loose fit.

[0066] Moreover, the retaining member 33b is provided at its outer periphery wall with an engagement piece 48. The engagement piece 48 is similar in form to the engagement piece 38 of the retaining member 33a. The engagement piece 48 is a plate piece protruding toward the first side from the retaining member 33b.

In this embodiment, there are provided four engagement pieces 48 arranged equidistantly on the outer periphery wall of the base body 3b. Each of the engagement pieces 48 is positioned face to face with the corresponding engagement piece 24 of the base body 3b. The engagement piece 48 is a member for engagement with the coupling member 39 which passes through the space between the individual projecting pieces 15b of the converting member 9b.

[0067] The coupling member 39 is mounted, with the groove 40 engaged with the protruding engagement piece 24 (i.e. the base body 3b), by using a fastening tool, etc. Moreover, the coupling member 39 is mounted, with the groove 40 engaged with the protruding engagement piece 48 positioned face to face with the engagement piece 24 (i.e. the retaining member 33b), by using a fastening tool, etc.

That is, the coupling member 39 is disposed so as to span the region between the retaining member 33b and the base body 3b. This arrangement enables the coupling member 39 to securely couple the retaining member 33a and the base body 3a together.

[0068] Between the retaining member 33b and the base body 3b is disposed the cross-shaped converting member 9b in an isolated fashion. Moreover, the projecting piece 15b of the converting member 9b protrudes radially outwardly, and is rocked within the range of the space between the adjacent coupling members 39.

Together with the retaining member 33b, the ring member 34b retains in sandwich relation the boss member 32b in a loose fit. The ring member 34b is inserted inside the boss member 32b, and is attached to the retaining member 33b with a fastening tool, etc.

[0069] The ring member 34b is similar in form to the ring member 34a. That is, the ring member 34b is substantially equal in outside diameter and inside diameter to the ring member 34a.

The ring member 34b includes a rib member. The rib member is similar in form to the rib member 42 of the ring member 34a. That is, the rib member is substantially equal in outside diameter and inside diameter to the rib member 42.

[0070] Thus, the ring member 34b is disposed toward the first side for attachment to the retaining member 33b, with the boss member 32b held in between, and rotatably retains the boss member 32b in a loose fit without causing backlash.

That is, the boss member 32 is retained in a loose fit by the retaining member 33 and the ring member 34. Moreover, the retaining member 33 is attached to the base body 3 so as to be retained in an isolated fashion within the intermediate cylindrical body 4, and is thus not subject to vibration transmitted to the intermediate cylindrical body 4 from the vibration-generating mechanism 2. Thus, the grip section 7 is rotatably mounted in non-connecting relation to the cover body 5, and serves as the "non-vibrating section" to which vibration from the vibration-generating mechanism 2 is not transmitted.

[0071] The present invention provides the massage device 1 that produces a massage effect by vibration on a treatment part. In this construction, for example, with the boss member 13a comprising the eccentrically rotatable cylindrical portion 14a and the weight portion 14b opposed through the first-side output shaft 12a to the cylindrical portion 14a, the cylindrical portion 14a transmits rotational motion to the converting member

9a, and, the weight portion 14b prevents transmission of vibrational motion resulting from conversion by the converting member 9a to the main body 11 of the drive motor 8. Thus, the grip section 7 becomes the non-vibrating section (to which no vibration is transmitted), and, the component serving as the vibrating section is limited to the cover body 5 having the treatment element 6 (including the vibration-generating mechanism 2 and the intermediate cylindrical body 4). Moreover, the grip section 7 is retained free of the vibrating section (i.e. the vibration-generating mechanism 2, the intermediate cylindrical body 4, and the cover body 5).

[0072] With such an arrangement provided in the massage device 1, the user is able to carry the massage device 1 easily by the grip section 7. Moreover, even when operated with the grip section 7 set on the floor surface F or other area, the massage device 1 performs massage in a predetermined location without vibration being transmitted to the floor surface or other area.

That is, even when the entire massage device 1 vibrates at turn-on, the resulting vibration is not transmitted to the floor surface or other area, thereby preventing the massage device from moving in an unexpected direction before the user places the foot on the device main body.

[0073] It should be understood that the embodiment as disclosed herein is considered in all respects as illustrative

only and not restrictive.

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

[0074] For example, the configuration of the non-vibrating section, and more specifically the outside diameters and the inside diameters of the boss member 32, the retaining member 33, the retaining member 33, and the ring member 34 that constitute the retaining portion 31, and, the shape of each of the right-hand and left-hand grip sections 7 and the spacing between these grip sections 7, and also the configuration of the vibrating section (i.e. the vibration-generating mechanism 2, the intermediate cylindrical body 4, and the cover body 5), etc. may be changed as needed with consideration given to the range of massage treatment.

Moreover, while a circular cylinder shape exemplifies the shape of the cylindrical members such as the intermediate cylindrical body 4 and the cover body 5 in this embodiment, such a member may be shaped either in a cylinder which is elliptic in diametrical section or in a polygonal prism, e.g. a hexagonal prism.

Reference Signs List

[0075]

- 1 Massage device
- 2 Vibration-generating mechanism
- 2a First-side vibration-generating portion
- 2b Second-side vibration-generating portion
- 3 Base body
- 3a Base body (on the first side)
- 3b Base body (on the second side)
- 4 Intermediate cylindrical body
- 5 Cover body
- 5a Outer cylinder
- 5b Inner cylinder
- 6 Treatment element
- 7 Grip section
- 7a Grip section (on the first side)
- 7b Grip section (on the second side)
- 8 Drive motor
- 9 Converting member
- 9a Converting member (on the first side)
- 9b Converting member (on the second side)
- 10 Vibrating element
- 10a Vibrating element
- 10b Vibrating element
- 11 Main body

12a First-side output shaft
12b Second-side output shaft
13 Boss member
13a Boss member
13b Boss member
14a Cylindrical portion
14b Weight portion
14c Plate member
14d Hole
15a Projecting piece
15b Projecting piece
16 Hole (in Projecting piece)
16a Hole (on the first side)
16b Hole (on the second side)
17 Hole (Central hole)
18 Bearing
19 Elastic member
20 Hole (in Base body)
21 Restraining shaft portion
22 Engagement piece
23 Restraining shaft portion
24 Engagement piece
25 Fit hole (in Intermediate cylindrical body)
25a Fit hole (on the first side)
25b Fit hole (on the second side)

26	Annular fit portion
27	Recess
28	Projection
29	Edge
29a	Edge
29b	Edge
30	Placement portion
31	Retaining portion
31a	Retaining portion (on the first side)
31b	Retaining portion (on the second side)
32	Boss member
32a	Boss member
32b	Boss member
33	Retaining member
33a	Retaining member
33b	Retaining member
34	Ring member
34a	Ring member
34b	Ring member
35	Bottom plate
36	Hole
36a	Hole
36b	Hole
36c	Hole
37	Rib member

38	Engagement piece
39	Coupling member
40	Groove
41	Bottom plate
42	Rib member
43	Lid member
44	Operating switch
45	Bottom plate
46	Hole
47	Rib member
48	Engagement piece
F	Floor surface
T	Foot

CLAIMS

1. A massage device, comprising:
 - a vibrating section that applies massage by vibration to a treatment part, and has a roll form; and
 - a non-vibrating section, disposed on each of opposite sides of the vibrating section, to which the vibration is not transmitted.
2. The massage device according to claim 1, comprising:
 - a vibration-generating mechanism configured to apply vibratory massage to the treatment part;
 - a base body that accommodates the vibration-generating mechanism;
 - a cylindrically shaped cover body which circumferentially surrounds the base body, has a surface provided with a treatment element, and is vibrated by the vibration-generating mechanism; and
 - a grip section disposed at each of longitudinal ends of the cover body,
 - the cover body serving as the vibrating section,
 - the grip section being mounted in non-connecting relation to the cover body, and serving as the non-vibrating section to which vibration from the vibration-generating mechanism is not transmitted.

3. The massage device according to claim 2,
wherein the grip section has an outside diameter greater than
an outside diameter of the cover body,
and wherein the grip section has an outer periphery provided
with a placement portion placeable on a floor surface.

4. The massage device according to claim 3,
wherein the placement portion is configured to prevent, upon
placing of the massage device on the floor surface, the massage
device from rolling thereon.

5. The massage device according to claim 4,
wherein the grip section is retained in a loose fit by a retaining
portion.

6. The massage device according to claim 5,
wherein the retaining portion comprises a cylindrically shaped
boss member fitted over an annular fit portion of the grip section,
a cylindrically shaped retaining member that retains the boss
member in a loose fit, and a ring member, fastened to the retaining
member, for preventing the boss member from coming off.

7. The massage device according to claim 6,
wherein the retaining member has an outside diameter smaller

than an inside diameter of the boss member.

8. The message device according to claim 7, wherein the grip section is mounted in non-connecting relation to the cover body, with the boss member retained in a loose fit by the retaining member and the ring member.

9. The message device according to claim 8, wherein the retaining member is attached to the base body so as to be retained in an isolated fashion within the cover body, and is thus not subject to vibration transmitted to the cover body from the vibration-generating mechanism.

10. The message device according to any one of claims 2 to 9, wherein the vibration-generating mechanism comprises a drive motor that produces a rotational driving force, a converting member that converts the rotational driving force into vibrational motion, and a vibrating element disposed on the converting member, and wherein the cover body is coupled via the vibrating element to the converting member.

11. The message device according to claim 10, wherein the converting member is attached via an elastic member

to the base body.

12. The massage device according to claim 11,
wherein the drive motor has an output shaft provided with a boss
member having an axis of rotation which is eccentric with respect
to the output shaft,
and wherein the vibration-generating mechanism produces
vibration by the eccentricity of the boss member with respect
to the output shaft of the drive motor,

the boss member being fitted with a weight portion that
prevents the vibration from being transmitted toward the drive
motor.