

SPECIFICATION

TITLE OF THE INVENTION: MESSAGE UNIT AND CHAIR-TYPE MASSAGE MACHINE

TECHNICAL FIELD

[0001]

The present disclosure relates to a message unit in which treatment components move outward in the left-right direction in response to a load from a treatment region, and to a chair-type massage machine that includes the message unit. This application claims priority on Japanese Patent Application No. 2024-065901 filed on April 16, 2024, the entire content of which is incorporated herein by reference.

BACKGROUND ART

[0002]

Conventionally, a massage device that applies a massage motion to a treatment region such as the shoulder region or the neck region of a user leaning against a backrest portion, as disclosed in PATENT LITERATURE 1, has been known.

CITATION LIST

[PATENT LITERATURE]

[0003]

PATENT LITERATURE 1: Japanese Laid-Open Patent Publication No. 2023-115160

SUMMARY OF THE INVENTION

[0004]

A massage unit according to an aspect of the present disclosure is a massage unit that includes a pair of left and right massage members provided on a base, and a drive mechanism configured to generate a kneading motion on a treatment region by causing the pair of left and right massage members to move toward and away from each other. The massage members disposed in a left-and-right pair each include an arm portion whose proximal end is supported by the base via the drive mechanism, a support shaft provided at a distal end and on an inner side, in a left-right direction, of the arm portion so as to intersect a longitudinal direction of the arm portion, a first treatment component supported by the support shaft so as to be movable along the support shaft, and an elastic member that biases the first treatment component inward in the left-right direction. In response to a load applied to the first treatment component, the elastic member elastically deforms, and the first treatment component is allowed to move outward in the left-right direction along the support shaft.

BRIEF DESCRIPTION OF DRAWINGS

[0005]

[FIG. 1] FIG. 1 is a perspective view of a chair-type massage machine including a massage unit according to an embodiment, as viewed from the front left side.

[FIG. 2] FIG. 2 is a perspective view of the massage unit according to the embodiment, as viewed from the front right side.

[FIG. 3] FIG. 3 is an exploded perspective view of the massage unit according to the embodiment.

[FIG. 4] FIG. 4 is an exploded perspective view of a massage member according to the embodiment.

[FIG. 5] FIG. 5 shows a cross-sectional structure of a treatment component

according to a first embodiment in which an elastic member is at its free length, and a usage mode thereof as viewed from the rear side.

[FIG. 6] FIG. 6 shows a cross-sectional structure of the treatment component according to the first embodiment in which the elastic member is in an elastically deformed state, and a usage mode thereof as viewed from the rear side.

[FIG. 7] FIG. 7 shows a cross-sectional structure of a treatment component according to a second embodiment in which an elastic member is at its free length, and a usage mode thereof as viewed from the rear side.

[FIG. 8] FIG. 8 shows a cross-sectional structure of the treatment component according to the second embodiment in which the elastic member is in an elastically deformed state, and a usage mode thereof viewed from the rear side.

DETAILED DESCRIPTION

[0006]

<Problems to be solved by the present disclosure>

PATENT LITERATURE 1 discloses a massage unit including treatment components, actuators extendable and retractable in the longitudinal direction, and arms that each have the treatment component mounted to one end thereof. One end of each actuator is mounted to the other end of a corresponding arm, and a first pivot point that serves as the pivot point of the arm is provided at an intermediate portion of the arm. The positional relationship between the first pivot point and a second pivot point that serves as the pivot point of the actuator and is located at the other end of the actuator, or the positional relationship between the first pivot point and the other end of the actuator, is fixed. A pair of left and right rotary shafts that each serve as the first pivot point are independently rotatable.

[0007]

In recent years, some users have reported that a massage sensation provided by a kneading massage on the neck region is slightly stronger than a massage sensation on the shoulder region. In particular, since the width in the left-right direction of a treatment region such as the neck varies depending on the body size of each user, a user who has a thick neck tends to express such an opinion. However, in the massage device of PATENT LITERATURE 1, the interval between the treatment components is set so as to correspond to a certain treatment width. Thus, when a narrow treatment region such as the neck is treated, a force pressing the treatment region tends to act in a direction that reduces the interval between a pair of massage members, and the massage sensation inevitably becomes slightly stronger for some users.

[0008]

Therefore, in view of the above-described problems, an object of the present disclosure is to provide a massage unit and a chair-type massage machine that can provide an appropriate massage sensation without causing discomfort to a user even when a treatment region that is narrow in the left-right direction is massaged.

[0009]

<Effects of the present disclosure>

Even when a treatment region that is narrow in the left-right direction is massaged, the massage unit and the chair-type massage machine according to the present disclosure can provide an appropriate massage sensation equivalent to that on a wide treatment region, and no discomfort is caused to the user. That is, even when a treatment region such as the neck is massaged, the massage unit and the chair-type massage machine according to the present disclosure can provide an appropriate massage sensation equivalent to that on a treatment region such as the shoulders, and no discomfort is caused to users having different body sizes.

[0010]

<Outline of embodiment of the present disclosure>

Hereinafter, the outlines of embodiments of the present disclosure will be listed and described.

[0011]

In order to achieve the above-described object, the present disclosure employs the following technical measures.

[0012]

(1) A massage unit according to the present disclosure is a massage unit that includes a pair of left and right massage members provided on a base, and a drive mechanism configured to generate a kneading motion on a treatment region by causing the pair of left and right massage members to move toward and away from each other. The massage members disposed in a left-and-right pair each include an arm portion whose proximal end is supported by the base via the drive mechanism, a support shaft provided at a distal end and on an inner side, in a left-right direction, of the arm portion so as to intersect a longitudinal direction of the arm portion, a first treatment component supported by the support shaft so as to be movable along the support shaft, and an elastic member that biases the first treatment component inward in the left-right direction. In response to a load applied to the first treatment component, the elastic member elastically deforms, and the first treatment component is allowed to move outward in the left-right direction along the support shaft.

[0013]

(2) In the above (1), the elastic member may be a coil spring wound around an outer peripheral surface of the support shaft about an axis of the support shaft.

[0014]

(3) In the above (2), a recess portion may be formed in the first treatment component, the recess portion may be fitted onto the support shaft in a clearance-fit state, and an accommodating portion in which an elastic member is disposed may be provided between the

support shaft and the recess portion.

[0015]

(4) In the above (2), a recess portion may be formed in the arm portion, the support shaft may be disposed in the recess portion, a portion of the first treatment component may be slidably fitted into the recess portion, and an accommodating portion in which an elastic member is disposed may be provided between the recess portion and the portion of the first treatment component.

[0016]

(5) In the above (2), at the distal end of each arm portion provided in the pair of left and right massage members, the arm portion may be interposed between the first treatment component and a second treatment component, the first treatment component may be provided on an inner side in the left-right direction, and the second treatment component may be disposed on an outer side in the left-right direction.

[0017]

(6) In the above (5), the second treatment component may be supported by the support shaft in a state where movement of the second treatment component in a direction along an axial direction of the support shaft is restricted.

[0018]

(7) In the above (1), the massage unit includes a grasping massage mechanism configured to perform a grasping massage on the treatment region. The grasping massage mechanism may include a grasping treatment component disposed so as to be spaced from the first treatment component in an up-down direction, and may cause the grasping treatment component to swing in the up-down direction by means of the drive mechanism such that the grasping treatment component moves toward and away from the first treatment component.

[0019]

(8) A chair-type massage machine according to the present disclosure includes a seat portion, a backrest portion, and the massage unit provided in the backrest portion.

[0020]

<Details of embodiment of the present disclosure>

Hereinafter, the details of embodiments of the present disclosure will be described with reference to the drawings. At least parts of the embodiments described below may be combined as desired.

[0021]

Hereinafter, a massage unit according to the present disclosure will be described. Specifically, the embodiments of a chair-type massage machine that incorporates the massage unit will be described with reference to the drawings.

[0022]

Each embodiment described below is an exemplary embodiment of the present disclosure, and a specific example thereof is not intended to limit the configuration of the present disclosure. In addition, for clarity, some components have been omitted from the drawings.

[0023]

The up-down, front-rear, left-right, and other directions of a chair-type massage machine 1 are as shown in FIG. 1. The up-down, left-right, front-rear, and other directions of a massage unit 10 are as shown in FIG. 3. In the following description, the directions shown in the drawings will be used as those for describing the chair-type massage machine 1 and the massage unit 10 of the present disclosure.

[0024]

As shown in FIG. 1, the chair-type massage machine 1 of the present embodiment includes a seat portion 2 having a sufficient size to seat a user U, and a backrest portion 3 which is provided on the rear side of the seat portion 2 and against which the user U can lean.

[0025]

The seat portion 2 is formed by combining polygonal bar-shaped members and is supported from below at a predetermined height. The seat portion 2 is covered by a casing, a sheet, or the like, and a cushion member is provided on the upper surface of the seat portion 2. Armrest portions 4 are provided on the left and right sides of the seat portion 2. A seat massage mechanism that massages the lower limbs of the user U may be provided inside the seat portion 2.

[0026]

The backrest portion 3 is a member provided behind the seat portion 2, and is formed in a thick flat plate shape such that the user U can lean against the backrest portion 3. The backrest portion 3 includes a back massage mechanism 5 that massages the back region of the user U.

[0027]

As shown in FIG. 2, the back massage mechanism 5 includes guide rails 6 disposed along the up-down direction inside the backrest portion 3, and the massage unit 10 capable of moving along the guide rails 6 in the up-down direction inside the backrest portion 3. The backrest portion 3 is supported behind the seat portion 2 so as to be swingable (reclinable) in the front-rear direction, and the back massage mechanism 5 can tilt in accordance with the reclining of the backrest portion 3.

[0028]

In the present embodiment, two guide rails 6, one on the left and the other on the right, are provided inside the backrest portion 3. The guide rails 6 include a left guide rail 6L disposed in the left portion of the backrest portion 3 and a right guide rail 6R disposed in the right portion of the backrest portion 3. A left rack gear 7L is formed on the left guide rail 6L, and a right rack gear 7R is formed on the right guide rail 6R. The left rack gear 7L and the

right rack gear 7R are mounted in the backrest portion 3 in an upright posture such that teeth of the left rack gear 7L and the right rack gear 7R face substantially forward. A left pinion gear 37L meshes with the left rack gear 7L, and a right pinion gear 37R meshes with the right rack gear 7R, so that the massage unit 10 is allowed to travel along the left guide rail 6L and the right guide rail 6R.

[0029]

In the present embodiment, the massage unit 10 moves inside the backrest portion 3 to perform at least a kneading massage motion on a treatment region ranging from the neck region or the shoulder region, through the back, to the lower back region of the user U leaning against the backrest portion 3. That is, the back region ranging from the neck region or the shoulder region, through the back, to the lower back region of the user U is the treatment region that is treated by the massage unit 10 of the present disclosure.

[0030]

As shown in FIG. 3, the massage unit 10 of the present embodiment includes a base 15, a pair of left and right massage members (left massage member 16L and right massage member 16R) provided on the base 15, and a drive mechanism 17 that is disposed on the base 15 and generates a massage motion (kneading motion) on the treatment region by causing the pair of left and right massage members (left massage member 16L and right massage member 16R) to move toward and away from each other.

[0031]

The base 15 is disposed between the left guide rail 6L and the right guide rail 6R, and includes the left pinion gear 37L that meshes with the left rack gear 7L and the right pinion gear 37R that meshes with the right rack gear 7R. The base 15 includes a lifting and lowering drive unit (not shown) that drives the left pinion gear 37L and the right pinion gear 37R so as to rotate. The lifting and lowering drive unit drives and rotates the left pinion gear 37L and the

right pinion gear 37R, so that the base 15 is allowed to move along a direction in which the left guide rail 6L and the right guide rail 6R are installed.

[0032]

As shown in FIG. 3 and FIG. 4, the massage members 16 include the left massage member 16L provided at a left portion of the base 15 and the right massage member 16R provided at a right portion of the base 15, and a kneading massage is performed on a treatment region by sandwiching the treatment region between a left first treatment component 19L provided at the distal end of the left massage member 16L and a right first treatment component 19R provided at the distal end of the right massage member 16R.

[0033]

The left massage member 16L and the right massage member 16R are arranged and structured in left-right symmetry with respect to the base 15. The left massage member 16L includes a left arm portion 13L, a left support shaft 18L provided at the right-side surface of the distal end of the left arm portion 13L, and the left first treatment component 19L supported by the left support shaft 18L. The right massage member 16R includes a right arm portion 13R, a right support shaft 18R provided at the left-side surface of the distal end of the right arm portion 13R, and the right first treatment component 19R supported by the right support shaft 18R. The left support shaft 18L is disposed so as to intersect (in the present embodiment, to be substantially orthogonal to) the longitudinal direction of the left arm portion 13L, and the right support shaft 18R is disposed so as to intersect (in the present embodiment, to be substantially orthogonal to) the longitudinal direction of the right arm portion 13R.

[0034]

As shown in FIG. 2 to FIG. 4, the arm portions 13 are arm-shaped members extending from the base 15. The arm portions 13 of the present embodiment include the left arm portion 13L provided in the left massage member 16L and the right arm portion 13R

provided in the right massage member 16R.

[0035]

As shown in FIG. 2, each arm portion 13 of the present embodiment extends from its proximal end, which is supported by the base 15 via the drive mechanism 17, toward its distal end in a direction away from the base 15. A left rotation-restricting portion 21L for restricting the left arm portion 13L from rotating integrally with a rotary shaft 9 is provided on the proximal end side of the left arm portion 13L, and a right rotation-restricting portion 21R for restricting the right arm portion 13R from rotating integrally with the rotary shaft 9 is provided on the proximal end side of the right arm portion 13R.

[0036]

In addition, in the present embodiment, a left annular engagement portion 14L of the drive mechanism 17 is provided on the proximal end side of the left arm portion 13L and a right annular engagement portion 14R of the drive mechanism 17 is provided on the proximal end side of the right arm portion 13R.

[0037]

The drive mechanism 17 includes a drive unit 17a that generates a rotational driving force, and a conversion unit 17b that converts the rotational driving force generated by the drive unit 17a into swinging motions of the pair of left and right massage members 16 (left massage member 16L and right massage member 16R).

[0038]

The drive unit 17a of the drive mechanism 17 of the present embodiment includes a drive motor 8 provided on the base 15. In addition, the conversion unit 17b of the drive mechanism 17 includes the rotary shaft 9 that rotates about an axis oriented in the left-right direction under the rotational driving force of the drive motor 8, rotating boss portions 11 mounted on the rotary shaft 9, cam surfaces 12 that are formed around the peripheries of the

rotating boss portions 11 and that are continuous and inclined with respect to the left-right direction, and annular engagement portions 14 (the above-described left annular engagement portion 14L and right annular engagement portion 14R) that are provided at the proximal ends of the arm portions 13 and that are slidably and externally fitted onto the cam surfaces 12.

[0039]

The drive motor 8 of the present embodiment is disposed on the base 15 such that a drive shaft 8a faces downward. One or more gears (gears including a worm gear in the present embodiment) for transmitting the rotational driving force of the drive shaft 8a of the drive motor 8 to the rotary shaft 9 are provided between the drive motor 8 and the rotary shaft 9.

[0040]

The rotary shaft 9 is provided to the base 15 such that the axis of the rotary shaft 9 is oriented in the left-right direction so as to be rotatable. The rotary shaft 9 extends in both the right direction and the left direction with respect to the drive motor 8 (drive shaft 8a). The left rotating boss portion 11L is mounted on a left portion of the rotary shaft 9 with respect to the drive shaft 8a, and the right rotating boss portion 11R is mounted on a right portion of the rotary shaft 9 with respect to the drive shaft 8a, such that the left rotating boss portion 11L and the right rotating boss portion 11R are rotatable integrally with the rotary shaft 9.

[0041]

Both the left rotating boss portion 11L and the right rotating boss portion 11R are multi-stepped cylindrical members. A left cam surface 12L is formed on the outer peripheral side of the left rotating boss portion 11L, and a right cam surface 12R is formed on the outer peripheral side of the right rotating boss portion 11R. Both the left cam surface 12L and the right cam surface 12R are each formed in a cylindrical surface shape and extend circumferentially about an axis oriented in a direction intersecting the axis of the rotary shaft 9.

[0042]

The inclination directions of the left cam surface 12L and the right cam surface 12R (directions in which the axes of the left cam surface 12L and the right cam surface 12R are oriented) are oppositely oriented relative to each other in the left-right direction (symmetric with respect to a line oriented in the up-down direction). For example, when (the axis of) the left cam surface 12L is inclined to the left relative to the axis of the rotary shaft 9, (the axis of) the right cam surface 12R is inclined to the right relative to the axis of the rotary shaft 9. In addition, when (the axis of) the left cam surface 12L is inclined to the right relative to the axis of the rotary shaft 9, (the axis of) the right cam surface 12R is inclined to the left relative to the axis of the rotary shaft 9.

[0043]

Since the left annular engagement portion 14L and the right annular engagement portion 14R are slidably fitted onto the left cam surface 12L and the right cam surface 12R, respectively, the left arm portion 13L and the right arm portion 13R perform swinging movements such that the left arm portion 13L and the right arm portion 13R move toward and away from each other in cooperation with the rotation-restricting portions described below.

[0044]

The left rotation-restricting portion 21L is provided at the proximal end of the left arm portion 13L, and restricts the left arm portion 13L from rotating about the axis of the rotary shaft 9 while allowing the left arm portion 13L to swing along the left-right direction. The right rotation-restricting portion 21R is provided at the proximal end of the right arm portion 13R, and restricts the right arm portion 13R from rotating about the axis of the rotary shaft 9 while allowing the right arm portion 13R to swing along the left-right direction. When the left rotation-restricting portion 21L and the right rotation-restricting portion 21R are caused to perform reciprocating movements in the front-rear direction, the left arm portion 13L and the right arm portion 13R can perform reciprocating movements about the axis of the rotary shaft 9,

whereby the treatment components (left first treatment component 19L and right first treatment component 19R) are allowed to perform tapping motions.

[0045]

When the rotary shaft 9 is rotated by the drive motor 8, the left rotating boss portion 11L and the right rotating boss portion 11R rotate integrally with the rotary shaft 9. The left annular engagement portion 14L is slidably fitted onto the left cam surface 12L of the left rotating boss portion 11L, and the right annular engagement portion 14R is slidably fitted onto the right cam surface 12R of the right rotating boss portion 11R. The left arm portion 13L is restricted from performing integrated rotation by the left rotation-restricting portion 21L, and thus does not rotate integrally even when the left rotating boss portion 11L rotates.

[0046]

On the other hand, when the left rotating boss portion 11L rotates, the inclination direction of the left cam surface 12L alternates between left and right, and thus the left massage member 16L (left arm portion 13L) slides in the left-right direction following the inclination direction of the left cam surface 12L. In addition, the right annular engagement portion 14R provided on the proximal end side of the right arm portion 13R is also slidably fitted onto the right cam surface 12R of the right rotating boss portion 11R. Since the right arm portion 13R is also restricted from performing integrated rotation by the right rotation-restricting portion 21R, the right massage member 16R (right arm portion 13R) also tilts left and right in response to alternation in the inclination direction of the right cam surface 12R. Since the inclination directions of the left cam surface 12L and the right cam surface 12R are set to be opposite to each other in the left-right direction, the left arm portion 13L and the right arm portion 13R perform swinging movements in opposite directions along the left-right direction.

[0047]

That is, the left arm portion 13L and the right arm portion 13R repeatedly perform

motions toward and away from each other in the left-right direction. Thus, when the treatment region is located between the left first treatment component 19L provided on the distal end side of the left arm portion 13L and the right first treatment component 19R provided on the distal end side of the right arm portion 13R, a kneading massage can be performed on the treatment region.

[0048]

The above-described massage unit 10 includes a grasping massage mechanism 42 that performs a grasping massage on each treatment region between the left first treatment component 19L and a left grasping treatment component 41L and between the right first treatment component 19R and a right grasping treatment component 41R.

[0049]

Next, the grasping massage mechanism 42 will be described.

[0050]

As shown in FIG. 2, the grasping massage mechanism 42 of the present embodiment includes a pair of left and right grasping massage members (left grasping massage member 43L and right grasping massage member 43R). In addition, the drive mechanism 17 (conversion unit 17b) has a function of swinging the pair of left and right grasping massage members (left grasping massage member 43L and right grasping massage member 43R) about the rotary shaft 9 in the up-down direction.

[0051]

In the following description of the grasping massage members 43, only the left grasping massage member 43L will be described. The description of the right grasping massage member 43R will be omitted, except for cases where a motion or the like cannot be described without referring to the pair of left and right grasping massage members 43.

[0052]

The left grasping massage member 43L includes a left grasping arm portion 44L whose proximal end is provided on the base 15 via the drive mechanism 17, and the left grasping treatment component 41L provided at the distal end of the left grasping arm portion 44L. The left grasping arm portion 44L includes a left first grasping arm 45L disposed on the proximal end side of the left grasping arm portion 44L and a left second grasping arm 46L disposed on the distal end side of the left grasping arm portion 44L. The left first grasping arm 45L is coupled to an intermediate portion of the left second grasping arm 46L so as to be swingable about the axis oriented in the left-right direction. The proximal end of the left second grasping arm 46L is coupled to an intermediate portion of the left arm portion 13L so as to be swingable about an axis oriented in the left-right direction. The left grasping treatment component 41L is disposed at the distal end of the left second grasping arm 46L.

[0053]

The conversion unit 17b of the drive mechanism 17 includes a left second rotating boss portion 47L disposed on the rotary shaft 9, and a left second annular engagement portion 48L pivotably and externally fitted onto the left second rotating boss portion 47L. A left second cam surface 49L extending circumferentially about the axis of the rotary shaft 9 is formed on an outer peripheral side of the left second rotating boss portion 47L. The left second cam surface 49L is formed in a cylindrical surface shape and extends circumferentially about an axis eccentric to the axis of the rotary shaft 9.

[0054]

When the rotary shaft 9 is rotated by the drive motor 8, the left second rotating boss portion 47L rotates integrally with the rotary shaft 9, and the left second annular engagement portion 48L slidably fitted onto the left second cam surface 49L is also to rotate about the axis. However, the distal end of the left first grasping arm 45L is coupled to the left arm portion 13L via the left second grasping arm 46L, and thus the left second annular

engagement portion 48L (left first grasping arm 45L) does not rotate.

[0055]

On the other hand, since the left second cam surface 49L is formed in a cylindrical surface shape and extends circumferentially about an axis eccentric to the axis of the rotary shaft 9, the left first grasping arm 45L swings about the axis of the rotary shaft 9 in the up-down direction. That is, the left second grasping arm 46L, to which the distal end of the left first grasping arm 45L is coupled, also swings in the up-down direction, and the left second grasping arm 46L repeatedly swings about its proximal end coupled to the left arm portion 13L in the up-down direction. As a result, the left grasping treatment component 41L swings in the up-down direction, and repeatedly moves toward and away from the left first treatment component 19L in the up-down direction, thereby enabling a grasping massage to be performed such that a treatment region located between both components is grasped.

[0056]

The above description relates to the configuration and effects of the left grasping massage member 43L. However, the right grasping massage member 43R also has the same configuration and the same effects.

[0057]

The left first treatment component 19L is supported by the left support shaft 18L of the left massage member 16L so as to be movable along the left support shaft 18L, and the right first treatment component 19R is supported by the right support shaft 18R of the right massage member 16R so as to be movable along the right support shaft 18R.

[0058]

In addition, a left elastic member 20L is provided between the left first treatment component 19L and the left support shaft 18L to bias the left first treatment component 19L rightward (inward in the left-right direction). A right elastic member 20R is provided between

the right first treatment component 19R and the right support shaft 18R to bias the right first treatment component 19R leftward (inward in the left-right direction).

[0059]

In the massage unit 10 of the present disclosure, in response to the loads applied to the left first treatment component 19L and the right first treatment component 19R, the left elastic member 20L and the right elastic member 20R elastically deform, and the left first treatment component 19L is allowed to move leftward (outward in the left-right direction) along the left support shaft 18L. In response to the load applied to the right first treatment component 19R, the right elastic member 20R elastically deforms, and the right first treatment component 19R is allowed to move rightward (outward in the left-right direction) along the right support shaft 18R.

[0060]

As shown in FIG. 3 and FIG. 4, the support shafts 18 are provided at the distal ends of the massage members 16 of the present embodiment. Specifically, the support shafts 18 include the left support shaft 18L provided at the distal end of the left massage member 16L (left arm portion 13L) and the right support shaft 18R provided at the distal end of the right massage member 16R (right arm portion 13R). The left support shaft 18L is a rod-shaped member and is provided at the inner side surface in the left-right direction of the distal end of the left arm portion 13L so as to extend inward in the left-right direction. The right support shaft 18R is a rod-shaped member provided at the inner side surface in the left-right direction of the distal end of the right arm portion 13R so as to extend inward in the left-right direction. Each of the left support shaft 18L and the right support shaft 18R of the present embodiment is formed in a round rod shape and has a structure with a hollow center. The left first treatment component 19L is supported on the right end side of the left support shaft 18L, and the right first treatment component 19R is supported on the left end side of the right support shaft 18R.

[0061]

As described with reference to the FIG. 1 to FIG. 4, an aspect in which, as the treatment components, the left and right first treatment components (left first treatment component 19L and right first treatment component 19R) and the left and right second treatment components (left second treatment component 22L and right second treatment component 22R) are provided, is described. However, in a conceivable simpler configuration of the massage unit 10 of the present disclosure, as treatment components of the pair of left and right massage members (left massage member 16L and right massage member 16R), only the left first treatment component 19L and the right first treatment component 19R may be provided.

[0062]

In the following description of the first treatment components 19, as a first embodiment, an aspect in which only the left first treatment component 19L and the right first treatment component 19R are provided (an aspect in which one kneading node is provided at the distal end of each arm portion), will be first described.

[0063]

As a second embodiment, an aspect in which, as treatment components, the left and right first treatment components (left first treatment component 19L and right first treatment component 19R) and the left and right second treatment components (left second treatment component 22L and right second treatment component 22R) are provided (an aspect in which two kneading nodes are provided at the distal end of each arm portion), will be described.

[0064]

In both the first embodiment and the second embodiment, the pair of left and right massage members (left massage member 16L and right massage member 16R) are arranged and structured in left-right symmetry. Thus, in the following description, only the left massage member 16L will be described. The description of the right massage member 16R is omitted

except for cases where a motion or the like cannot be described without referring to the pair of left and right massage members.

[0065]

[First embodiment]

As shown in an enlarged diagram in FIG. 5, the left first treatment component 19L of the first embodiment is formed in a cylindrical shape and has a concave intermediate portion in the left-right direction, using flexible plastic resin (e.g., PVC resin or the like). A left first insertion hole 24L having an opening diameter that is slightly larger than the outer diameter of the left support shaft 18L is formed in the interior of the left first treatment component 19L. The left first insertion hole 24L is formed so as to be oriented in the same direction as the axis of the left support shaft 18L and to pass through the interior of the left first treatment component 19L in the left-right direction. The left support shaft 18L is inserted in the left first insertion hole 24L so as to be slidable in the left-right direction.

[0066]

Specifically, at the distal end of the left arm portion 13L of the first embodiment, a left cylindrical portion 23L having a larger diameter than the left support shaft 18L is formed so as to protrude to the right (inward in the left-right direction). The left cylindrical portion 23L is formed in a cylindrical shape about an axis coaxial with the left support shaft 18L, and the left support shaft 18L is disposed at the protruding end (right end) of the left cylindrical portion 23L so as to be coaxial with the left cylindrical portion 23L.

[0067]

The left first treatment component 19L of the first embodiment includes a left first recess portion 25L on the left side of the left first insertion hole 24L. The left first recess portion 25L is a cylindrical recess that opens to the left (toward the left arm portion 13L), and includes a left cylindrical inner wall 26L formed in a cylindrical surface shape and a left deep-

side wall 27L that closes the right end of the left cylindrical inner wall 26L.

[0068]

The left cylindrical inner wall 26L is formed in a cylindrical surface shape, defines an inner diameter slightly larger than the outer diameter of the left cylindrical portion 23L, and can be fitted over the left cylindrical portion 23L. The left deep-side wall 27L is formed as a wall surface extending between the right end of the left cylindrical inner wall 26L and the left opening of the left first insertion hole 24L, along a direction intersecting the axis of the left support shaft 18L (a direction substantially perpendicular to the axis of the left support shaft 18L in the illustrated example).

[0069]

The left cylindrical inner wall 26L is spaced apart from the left support shaft 18L, and the left elastic member 20L is disposed between the left cylindrical inner wall 26L and the left support shaft 18L. That is, the space between the left cylindrical inner wall 26L and the left support shaft 18L serves as a left accommodating portion 28L that accommodates the left elastic member 20L.

[0070]

In the left first treatment component 19L of the first embodiment, a left second recess portion 30L is formed on the right side of the left first insertion hole 24L. The left second recess portion 30L opens to the right (inward in the left-right direction). The left support shaft 18L is disposed such that the distal end (right end) of the left support shaft 18L protrudes from the bottom wall of the left second recess portion 30L. At the distal end (right end) of the left support shaft 18L, a retaining means (e.g., a retaining pin, not shown) is attached to prevent the distal end of the left support shaft 18L from coming out to the left from the left second recess portion 30L.

[0071]

The elastic members 20 of the first embodiment include the left elastic member 20L that biases the left first treatment component 19L toward the right and the right elastic member 20R that biases the right first treatment component 19R toward the left.

[0072]

The left elastic member 20L is a coil spring wound around the outer peripheral surface of the left support shaft 18L. In a state shown in the enlarged diagram in FIG. 5, the left elastic member 20L does not generate a biasing force (restoring force) (the force is negligibly small). That is, the left elastic member 20L in the state shown in the enlarged diagram in FIG. 5 is at its free length (a length when no load is applied). In the first embodiment, as the left elastic member 20L, a coil spring having a length approximately equal to the internal dimension of the left first recess portion 25L along the left-right direction (the internal dimension of the left first recess portion 25L along the axial direction of the left support shaft 18L), is used. That is, the left end of the left cylindrical inner wall 26L is substantially aligned with the right end of the left cylindrical portion 23L, and the left accommodating portion 28L is a space closed by the left cylindrical portion 23L.

[0073]

As shown in FIG. 5, when a treatment region that is wide in the left-right direction, such as the shoulders, is massaged, the left arm portion 13L and the right arm portion 13R are set to a treatment width that is wide in the left-right direction (a swing width in the left-right direction) so as to be suitable for such a wide treatment region. The left first treatment component 19L and the right first treatment component 19R massage the treatment region such as the shoulders so as to rub the surface of the treatment region. Thus, in particular, when a treatment region having no protrusion or recess such as the shoulders is massaged, the left first treatment component 19L and the right first treatment component 19R are not subjected to much load. That is, even when a kneading massage is performed on the treatment region such as the

shoulders with the left first treatment component 19L and the right first treatment component 19R in a state shown in FIG. 5, a large force acts on neither the left elastic member 20L nor the right elastic member 20R in the compression direction, and each of the left elastic member 20L and the right elastic member 20R maintains its free length (a state where no elastic deformation occurs), while the kneading massage is performed. Therefore, when the treatment region such as the shoulders is massaged, the kneading massage can be performed on the treatment region without moving the left first treatment component 19L and the right first treatment component 19R toward the left arm portion 13L side and the right arm portion 13R side.

[0074]

On the other hand, as shown in FIG. 6, when a long, narrow, and delicate treatment region such as the neck is massaged, the left first treatment component 19L and the right first treatment component 19R are positioned so as to sandwich the neck, so that the massage may be performed while the treatment region is sandwiched therebetween. In particular, when the left arm portion 13L and the right arm portion 13R have been set to a wide treatment width (a swing width) so as to be suitable for the treatment region such as the shoulders, and then are caused to move closer to each other, the interval between the left arm portion 13L and the right arm portion 13R may become narrower than the width of the neck, and the massage sensation (massage intensity) on the treatment region is expected to become stronger and cause discomfort to the user.

[0075]

However, in the left massage member 16L and the right massage member 16R of the first embodiment, when the treatment region such as the neck is sandwiched between the left first treatment component 19L and the right first treatment component 19R, a large load is applied to the left first treatment component 19L and the right first treatment component 19R in a direction toward the left arm portion 13L side and the right arm portion 13R side (outward in the

left-right direction). As a result, the left elastic member 20L and the right elastic member 20R elastically deform (outward in the left-right direction) (the coil springs as the left elastic member 20L and the right elastic member 20R are compressed). For example, when the left elastic member 20L elastically deforms, the left first recess portion 25L is fitted (deeply pushed) over the left cylindrical portion 23L.

[0076]

Since the inner diameter defined by the left cylindrical inner wall 26L is slightly larger than the outer diameter of the left cylindrical portion 23L, the inner peripheral surface of the left cylindrical inner wall 26L slides relative to the outer peripheral surface of the left cylindrical portion 23L along the axis of the left support shaft 18L, and the left first treatment component 19L moves to the left (toward the left arm portion 13L side, outward in the left-right direction) along the axis of the left support shaft 18L. That is, the left elastic member 20L elastically deforms outward in the left-right direction, thereby allowing a force acting on the left first treatment component 19L in a direction toward the treatment region to be reduced.

[0077]

The above description relates to the left elastic member 20L. However, the same operation is performed with the right elastic member 20R.

[0078]

In other words, in the left massage member 16L and the right massage member 16R of the first embodiment, when the distal ends of the left arm portion 13L and the right arm portion 13R come closer to each other, the distance between the left first treatment component 19L and the right first treatment component 19R is increased. As a result, even when a treatment region that is narrow in the left-right direction, such as the neck, is massaged, a massage sensation that is as soft (appropriate) as that for a wide treatment region (a treatment region such as the shoulders) can be provided, and no discomfort is caused to the user.

[0079]

As the left elastic member 20L of the first embodiment, a coil spring having a length approximately equal to the internal dimension of the left first recess portion 25L along the left-right direction, is used. That is, the left end of the left cylindrical inner wall 26L is substantially aligned with the right end of the left cylindrical portion 23L, and the left accommodating portion 28L is a space closed by the left cylindrical portion 23L. Thus, in a case where the left accommodating portion 28L is the space closed by the left cylindrical portion 23L, it is possible to prevent foreign matter from entering the left accommodating portion 28L and the left elastic member 20L from corroding, so that the durability of the left elastic member 20L can be improved.

[0080]

In the left massage member 16L of the first embodiment, since the inner diameter defined by the left cylindrical inner wall 26L is formed slightly larger than the outer diameter of the left cylindrical portion 23L, the inner peripheral surface of the left cylindrical inner wall 26L is allowed to slide relative to the outer peripheral surface of the left cylindrical portion 23L along the axis of the left support shaft 18L. Thus, when the left first treatment component 19L is moved to the left, the left first recess portion 25L is fitted over the left cylindrical portion 23L while maintaining a state where the inner peripheral surface of the left cylindrical inner wall 26L slides relative to the outer peripheral surface of the left cylindrical portion 23L. When the left first recess portion 25L is fitted over the left cylindrical portion 23L in this manner, the left first treatment component 19L can be reliably moved along the axis of the left support shaft 18L without wobbling relative to the axis.

[0081]

In addition, in a case where a treatment region such as the back has protruding portions such as shoulder blades, when the treatment components are moved in the left and right

direction, the protruding portions on the treatment region may impose a load on the movements of the treatment components, and the massage sensation from the treatment components may become stronger and cause discomfort to the user. Even in such a case, when the left massage member 16L of the first embodiment is used, the left elastic member 20L elastically deforms (outward in the left-right direction), as in a case of the treatment region such as the neck (the coil spring as the left elastic member 20L is compressed). Thus, a soft (appropriate) massage sensation can be provided to the treatment region having the protruding portions to the same extent as a wide treatment region (a treatment region such as the shoulders), and no discomfort is caused to the user.

[0082]

The massage unit 10 of the first embodiment includes the grasping massage mechanism 42 that performs a grasping massage on a treatment region. The grasping massage mechanism 42 includes the left grasping treatment component 41L disposed so as to be spaced from the left first treatment component 19L in the up-down direction. In addition, the grasping massage mechanism 42 causes the grasping treatment component 41 to swing in the up-down direction by means of the drive mechanism 17.

[0083]

In a case where a grasping massage is performed on a treatment region using the grasping treatment component 41, when the left grasping treatment component 41L comes closer in the up-down direction to the distal end (left first treatment component 19L) of the left arm portion 13L of the first embodiment, the massage sensation provided by the grasping massage on the treatment region may become too strong. However, when the left elastic member 20L elastically deforms (outward in the left-right direction) and the left first treatment component 19L moves outward in the left-right direction, the force acting between the left first treatment component 19L and the left grasping treatment component 41L can be reduced, and no

discomfort is caused to the user.

[0084]

The above description relates to the effects associated with the left massage member 16L and the left grasping massage member 43L. However, the same effects are also exhibited with the right massage member 16R and the right grasping massage member 43R.

[0085]

[Second embodiment]

As shown in FIG. 7, in the second embodiment, the left massage member 16L includes, as treatment components, the left second treatment component 22L in addition to the left first treatment component 19L. The right massage member 16R includes, as treatment components, the right first treatment component 19R and the right second treatment component 22R. In the second embodiment, the left massage member 16L and the right massage member 16R include the left arm portion 13L and the right arm portion 13R, as in the first embodiment, and two treatment components are provided at each distal end of the left arm portion 13L and the right arm portion 13R so as to interpose the arm portion.

[0086]

Of the two treatment components, the left first treatment component 19L is provided on the right side (inward in the left-right direction) of the left arm portion 13L, and the left second treatment component 22L is provided on the left side (outward in the left-right direction) of the left arm portion 13L. In addition, the right first treatment component 19R is provided on the left side (inward in the left-right direction) of the right arm portion 13R, and the right second treatment component 22R is provided on the right side (outward in the left-right direction) of the right arm portion 13R.

[0087]

Each of the left first treatment component 19L and the left second treatment

component 22L of the second embodiment is formed in a cylindrical shape (wheel shape) that is short in the left-right direction, using flexible plastic resin as in the first embodiment. The left first insertion hole 24L having an opening diameter equal to the outer diameter of the left support shaft 18L is formed in the interior of the left first treatment component 19L. The left first insertion hole 24L is formed so as to be oriented in the same direction as the axis of the left support shaft 18L and to pass through the interior of the left first treatment component 19L in the axial direction. The left support shaft 18L is inserted in the left first insertion hole 24L so as to be movable in the left-right direction.

[0088]

Specifically, at (the right-side surface of) the distal end of the left arm portion 13L of the second embodiment, a cylindrical left third recess portion 29L having an opening diameter larger than the left support shaft 18L is formed so as to open to the right. The left third recess portion 29L is formed in a cylindrical shape and has an opening diameter larger than the outer diameter of the left support shaft 18L, and the left support shaft 18L is disposed at the center of the left third recess portion 29L so as to pass through the center (the axis of the cylindrical shape) of the left third recess portion 29L in the left-right direction. At the edge of the opening of the left third recess portion 29L, a left first protrusion portion 39L that protrudes to the right is formed along the edge of the opening so as to encircle the left third recess portion 29L.

[0089]

At the left-side surface of the left first treatment component 19L, a left fourth recess portion 31L that opens to the left is formed. A depth L1 of a recess (a distance from point P1 located on the left-side surface of the left first treatment component 19L to point P2 located on the deepest part of the recess of the left fourth recess portion 31L) along the axial direction of the left fourth recess portion 31L (the axial direction of the left support shaft 18L), is equal to a protrusion height L2 of the left first protrusion portion 39L (a distance from point P3

located on the right-side surface of the left arm portion 13L to point P4 located on the protruding end of the left first protrusion portion 39L, along the axial direction of the left support shaft 18L) from the right-side surface of the left arm portion 13L.

[0090]

A left slide member 32L is disposed between the left first treatment component 19L and the left third recess portion 29L. The left slide member 32L includes a ring-shaped left closure portion 33L that can be fitted with clearance into the left third recess portion 29L, and a left second protrusion portion 34L that protrudes to the left along the axial direction of the left support shaft 18L from the outer edge of the left closure portion 33L. A left through-hole 35L passing through the left closure portion 33L in the axial direction of the left support shaft 18L is formed at the center of the left closure portion 33L. The left support shaft 18L is inserted in the left through-hole 35L so as to be movable in the axial direction. The left second protrusion portion 34L is formed along the edge of the opening of the left closure portion 33L so as to encircle the left closure portion 33L.

[0091]

A depth L3 of a recess (a distance from point P5 located on the inner bottom wall of the left third recess portion 29L to point P4 located on the protruding end of the left first protrusion portion 39L, along the axial direction of the left support shaft 18L) along the axial direction of the left third recess portion 29L, is equal to a protrusion height L4 of the left second protrusion portion 34L (a distance from point P6 located on the right surface of the left closure portion 33L to point P7 located on the protruding end of the left second protrusion portion 34L, along the axial direction of the left support shaft 18L) from the right surface of the left closure portion 33L.

[0092]

The left support shaft 18L of the second embodiment has an outer diameter

smaller than the inner diameter of the left third recess portion 29L, and is formed in a cylindrical rod shape that is elongated in the left-right direction, and the left elastic member 20L is disposed on the outer peripheral surface of the left support shaft 18L.

[0093]

The left third recess portion 29L of the second embodiment is spaced from the outer peripheral surface of the left support shaft 18L, and the left elastic member 20L is disposed between the left support shaft 18L and the inner peripheral surface of the left third recess portion 29L. That is, the space between the left support shaft 18L and the inner peripheral surface of the left third recess portion 29L serves as the left accommodating portion 28L that accommodates the left elastic member 20L.

[0094]

As in the first embodiment, the left second recess portion 30L is also formed on the right side of the left first insertion hole 24L in the left first treatment component 19L of the second embodiment. The left second recess portion 30L opens to the right (inward in the left-right direction). The left support shaft 18L is disposed such that the distal end (right end) thereof protrudes into the left second recess portion 30L. At the distal end (right end) of the left support shaft 18L, a retaining means (e.g., a retaining pin, not shown) is attached to prevent the distal end of the left support shaft 18L from coming out to the right from the left second recess portion 30L.

[0095]

A left second insertion hole 38L having an opening diameter equal to the outer diameter of the left support shaft 18L is formed in the interior of the left second treatment component 22L. The left second insertion hole 38L is formed so as to be oriented in the same direction as the axis of the left support shaft 18L and to pass through the left first treatment component 19L in the axial direction (the axial direction of the left support shaft 18L). The left

support shaft 18L is inserted in the left second insertion hole 38L in a state where the movement in the left-right direction of the left support shaft 18L is restricted.

[0096]

Specifically, in the second embodiment, the left second insertion hole 38L having an opening diameter equal to the outer diameter of the left support shaft 18L is formed in the left second treatment component 22L. Similar to the left first insertion hole 24L, the left second insertion hole 38L is formed so as to be oriented in the same direction as the axis of the left support shaft 18L and to pass through the left second treatment component 22L in the axial direction. The left support shaft 18L is inserted in the left second insertion hole 38L so as to be movable in the left-right direction. In addition, at the distal end of the left arm portion 13L, a left third insertion hole 36L having an opening diameter equal to the outer diameter of the left support shaft 18L is formed. Similar to the left first insertion hole 24L, the left third insertion hole 36L is formed so as to be oriented in the same direction as the axis of the left support shaft 18L and to pass through the left arm portion 13L in the axial direction. The left third insertion hole 36L is formed adjacent to the left second insertion hole 38L in a state where openings of the left third insertion hole 36L and the left second insertion hole 38L are aligned, and the left support shaft 18L is inserted in the left third insertion hole 36L and the left second insertion hole 38L a state of being in communication.

[0097]

In the left second treatment component 22L of the second embodiment, a left fifth recess portion 40L is formed on the left side of the left second insertion hole 38L. The left fifth recess portion 40L opens to the left (outward in the left-right direction). The left support shaft 18L is disposed such that the left end thereof protrudes into the left fifth recess portion 40L. At the left end of the left support shaft 18L, a retaining pin (not shown) is attached to prevent the distal end (left end) of the left support shaft 18L from coming out to the right from the left fifth

recess portion 40L. The left second treatment component 22L is supported by the left arm portion 13L so as to be rotatable in a state where the movement of the left second treatment component 22L in a direction along the axial direction of the left support shaft 18L is restricted. [0098]

As shown in FIG. 7, when a treatment region that is wide in the left-right direction, such as the shoulders, is massaged, the left arm portion 13L and the right arm portion 13R are set to a treatment width (a swing width) that is wide in the left-right direction so as to be suitable for such a wide treatment region. The left first treatment component 19L and the right first treatment component 19R massage the treatment region such as the shoulders so as to stroke (rub) the surface of the treatment region. Thus, in particular, when the treatment region having no protrusion or recess such as the shoulders is massaged, the left first treatment component 19L and the right first treatment component 19R are not subjected to much load. That is, even when a kneading massage is performed on the treatment region such as the shoulders with the left first treatment component 19L and the right first treatment component 19R in the state shown in FIG. 7, a large force acts on neither the left elastic member 20L nor the right elastic member 20R in the compression direction, and each of the left elastic member 20L and the right elastic member 20R maintains its free length (a state where no elastic deformation occurs), while the kneading massage is performed. Therefore, when the treatment region such as the shoulders is massaged, the kneading massage can be performed on the treatment region without moving the left first treatment component 19L and the right first treatment component 19R toward the left arm portion 13L side and the right arm portion 13R side. [0099]

On the other hand, as shown in FIG. 8, when a long, narrow, and delicate treatment region such as the neck is massaged, the left first treatment component 19L and the right first treatment component 19R are positioned so as to sandwich the neck, so that the

massage may be performed while the treatment region is sandwiched therebetween. In particular, when the left arm portion 13L and the right arm portion 13R have been set to a wide treatment width (a swing width) so as to be suitable for the treatment region such as the shoulders, and then are caused to move closer to each other, the interval between the left arm portion 13L and the right arm portion 13R may become narrower than the width of the neck, and the massage sensation is expected to become stronger and cause discomfort to the user.

[0100]

However, in the left massage member 16L and the right massage member 16R of the second embodiment, when the treatment region such as the neck is sandwiched between the left first treatment component 19L and the right first treatment component 19R, a large load is applied to the left first treatment component 19L and the right first treatment component 19R in a direction toward the left arm portion 13L side and the right arm portion 13R side (outward in the left-right direction). As a result, the left elastic member 20L and the right elastic member 20R elastically deform (outward in the left-right direction) (the coil springs as the left elastic member 20L and the right elastic member 20R are compressed). For example, when the left elastic member 20L elastically deforms, the left first recess portion 25L is fitted (deeply pushed) over the left cylindrical portion 23L.

[0101]

Since the inner diameter defined by the left cylindrical inner wall 26L is slightly larger than the outer diameter of the left cylindrical portion 23L, the inner peripheral surface defined by the left cylindrical inner wall 26L slides relative to the outer peripheral surface of the left cylindrical portion 23L along the axis of the left support shaft 18L, and the left first treatment component 19L moves to the left (toward the left arm portion 13L side, outward in the left-right direction) along the axis of the left support shaft 18L. That is, the left elastic member 20L elastically deforms outward in the left-right direction, thereby allowing a force acting on the left

first treatment component 19L in a direction toward the treatment region to be reduced.

[0102]

The above description relates to the left elastic member 20L. However, the same operation is performed with the right elastic member 20R.

[0103]

In other words, in the left massage member 16L and the right massage member 16R of the second embodiment, when the distal ends of the left arm portion 13L and the right arm portion 13R come closer to each other, the distance between the left first treatment component 19L and the right first treatment component 19R is increased. As a result, even when a treatment region that is narrow in the left-right direction, such as the neck, is massaged, a massage sensation that is as soft (appropriate) as that for a wide treatment region (a treatment region such as the shoulders) can be provided, and no discomfort is caused to the user.

[0104]

As shown in FIG. 7 and FIG. 8, in the left massage member 16L and the right massage member 16R of the second embodiment, the respective distances between: the left first treatment component 19L and the right first treatment component 19R that move in directions toward the left arm portion 13L side and the right arm portion 13R side (move outward in the left-right direction); and the left second treatment component 22L and the right second treatment component 22R whose movements in the left-right direction are restricted, also vary according to elastic deformations of the left elastic member 20L and the right elastic member 20R. Thus, when the left massage member 16L and the right massage member 16R are arranged such that treatment regions are located between the left first treatment component 19L and the left second treatment component 22L and between the right first treatment component 19R and the right second treatment component 22R, a pinch-like massage can be performed on the treatment regions.

[0105]

As described above, the depth L1 of the recess (the distance from point P1 located on the left-side surface of the left first treatment component 19L to point P2 located on the deepest part of the recess of the left fourth recess portion 31L) along the axial direction of the left fourth recess portion 31L (the axial direction of the left support shaft 18L), is equal to the protrusion height L2 of the left first protrusion portion 39L (the distance from point P3 located on the right-side surface of the left arm portion 13L to point P4 located on the protruding end of the left first protrusion portion 39L, along the axial direction of the left support shaft 18L) from the right-side surface of the left arm portion 13L. As described above, in a case where the distance L1 is equal to the distance L2, when the left arm portion 13L has elastically deformed, the protruding end of the left first protrusion portion 39L of the left slide member 32L comes into contact with the recessed part (the deepest part of the recess) of the left fourth recess portion 31L, thereby restricting the movement of the left slide member 32L. Thus, the left elastic member 20L is not subjected to excessive force. In addition, even when the left elastic member 20L elastically deforms, the left first treatment component 19L can be prevented from coming into contact with the left arm portion 13L, and thus damage to the left first treatment component 19L can also be prevented.

[0106]

As described above, the depth L3 of the recess (the distance from point P5 located on the inner bottom wall of the left third recess portion 29L to point P4 located on the protruding end of the left first protrusion portion 39L, along the axial direction of the left support shaft 18L) along the axial direction of the left third recess portion 29L, is equal to the protrusion height L4 of the left second protrusion portion 34L (the distance from point P6 located on the right surface of the left closure portion 33L to point P7 located on the protruding end of the left second protrusion portion 34L, along the axial direction of the left support shaft 18L) from the right

surface of the left closure portion 33L. As described above, in a case where the distance L3 is equal to the distance L4, when the left elastic member 20L has elastically deformed, the protruding end of the left second protrusion portion 34L of the left slide member 32L comes into contact with the inner bottom wall of the left third recess portion 29L, thereby restricting the movement of the left slide member 32L. Thus, the left elastic member 20L is not subjected to excessive force. In addition, even then the left elastic member 20L elastically deforms, the left arm portion 13L can be prevented from coming into contact with the left first treatment component 19L, and thus damage to the left first treatment component 19L can also be prevented.

[0107]

The opening on the right side of the left third recess portion 29L is closed by the left slide member 32L, and the left accommodating portion 28L that accommodates the left elastic member 20L is a closed space. Thus, in a case where the left accommodating portion 28L is the space closed by the left slide member 32L, it is possible to prevent foreign matter from entering the left accommodating portion 28L and the left elastic member 20L from corroding, so that the durability of the left elastic member 20L can be improved.

[0108]

In the left massage member 16L of the second embodiment, since the inner diameter of the left third recess portion 29L is formed slightly larger than the outer diameter of the left slide member 32L, the inner peripheral surface of the left third recess portion 29L is allowed to slide relative to the outer peripheral surface of the left slide member 32L along the axis of the left support shaft 18L. Thus, when the left first treatment component 19L is moved to the left, the left third recess portion 29L is fitted over the left slide member 32L while maintaining a state where the inner peripheral surface of the left third recess portion 29L slides relative to the outer peripheral surface of the left slide member 32L. When the left third recess

portion 29L is fitted over the left slide member 32L in this manner, the left first treatment component 19L can be reliably moved along the axis of the left support shaft 18L without wobbling relative to the axis.

[0109]

The above description relates to the effects associated with the left massage member 16L. However, the same effects are exhibited with the right massage member 16R.

[0110]

Furthermore, the advantageous effects of the massage unit 10 described in the first embodiment, other than those described above, are also similarly exhibited by the massage unit 10 of the second embodiment. For example, when a grasping massage is performed on a treatment region using the grasping treatment components 41, the left elastic member 20L and the right elastic member 20R elastically deform (outward in the left-right direction). This allows the forces acting between the left first treatment component 19L and the right first treatment component 19R and the left grasping treatment component 41L and the right grasping treatment component 41R to be reduced. Therefore, an effect that can prevent the user from experiencing discomfort and other effects are also similarly exhibited by the massage unit 10 of the second embodiment.

[0111]

The embodiments disclosed herein are merely illustrative in all aspects and should not be recognized as being restrictive. In particular, matters that are not explicitly stated in the embodiments disclosed herein, for example, functional or operational conditions, or dimensions or weights of components, matters that do not depart from the ranges ordinarily practiced by those skilled in the art, and matters that are readily assumed by a person of ordinary skill in the art are applicable.

[0112]

The distance between the left and right massage members that move toward and away from each other, the swing speed thereof, the lateral interval therebetween, etc. (the coming-close and going-away distance between: the left massage member 16L and the right massage member 16R or the left first treatment component 19L and the right first treatment component 19R; and the left second treatment component 22L and the right second treatment component 22R, the swing speed thereof, the lateral interval therebetween, etc.), as described in the present embodiments, can be appropriately modified. In addition, the coming-close and going-away distance between: the left first treatment component 19L and the right first treatment component 19R; and the left grasping treatment component 41L and the right grasping treatment component 41R, the swing speed thereof, the lateral interval therebetween, etc. can also be appropriately modified.

[0113]

In addition to a kneading massage motion, the massage unit 10 may perform massage motions such as tapping and grasping. In the present embodiments, the treatment region is exemplified by the shoulder region, the neck region, and the like located on the back region of the user. However, the treatment region may include other portions such as the buttocks, thighs, hands, and arms.

[0114]

In addition, in the present embodiment, the left support shaft 18L and the right support shaft 18R are round rod-shaped members having hollow centers. However, the left support shaft 18L and the right support shaft 18R of the present disclosure may be solid rod-shaped members (whose centers are not hollowed out).

[0115]

For example, the configuration of the massage unit 10 such as the lengths of the left arm portion 13L and the right arm portion 13R, the inclination angles of the left arm portion

13L and the right arm portion 13R (the cam surfaces 12 of the rotating boss portions 11) relative to the rotary shaft 9, the separation distance between the left arm portion 13L and the right arm portion 13R, and the number of the treatment components, can be appropriately modified in consideration of the treatment ranges.

[0116]

Furthermore, kneading massage motions (e.g., the swing stroke width in the left-right direction that is the same as the directions in which the components move toward and away from each other, the timing, and the speed) performed by the massage unit 10 are not limited to the motions described in the present embodiment, and can be appropriately modified in consideration of the condition of the treatment region (e.g., the target region and the degree of muscle stiffness in that region).

[0117]

The basic configuration of the massage unit 10 described in the present embodiment is an example, and various other configurations may be employed.

REFERENCE SIGNS LIST

[0118]

- 1 chair-type massage machine
- 2 seat portion
- 3 backrest portion
- 4 armrest portion
- 5 back massage mechanism
- 6 guide rail
- 6L left guide rail
- 6R right guide rail

- 7L left rack gear
- 7R right rack gear
- 8 drive motor
- 8a drive shaft
- 9 rotary shaft
- 10 massage unit
- 11 rotating boss portion
- 11L left rotating boss portion
- 11R right rotating boss portion
- 12 cam surface
- 12L left cam surface
- 12R right cam surface
- 13 arm portion
- 13L left arm portion
- 13R right arm portion
- 14 annular engagement portion
- 14L left annular engagement portion
- 14R right annular engagement portion
- 15 base
- 16 massage member
- 16L left massage member
- 16R right massage member
- 17 drive mechanism
- 17a drive unit
- 17b conversion unit

- 18 support shaft
- 18L left support shaft
- 18R right support shaft
- 19 first treatment component
- 19L left first treatment component
- 19R right first treatment component
- 20 elastic member
- 20L left elastic member
- 20R right elastic member
- 21L left rotation-restricting portion
- 21R right rotation-restricting portion
- 22L left second treatment component
- 22R right second treatment component
- 23L left cylindrical portion
- 24L left first insertion hole
- 25L left first recess portion
- 25R right first recess portion
- 26L left cylindrical inner wall
- 27L left deep-side wall
- 28L left accommodating portion
- 28R accommodating portion
- 29L left third recess portion
- 30L left second recess portion
- 31L left fourth recess portion
- 32L left slide member

- 33L left closure portion
- 34L left second protrusion
- 35L left through-hole
- 36L left third insertion hole
- 37L left pinion gear
- 37R right pinion gear
- 38L left second insertion hole
- 39L left first protrusion
- 40L left fifth recess portion
- 41L left grasping treatment component
- 41R right grasping treatment component
- 42 grasping massage mechanism
- 43L left grasping massage member
- 43R right grasping massage member
- 44L left grasping arm portion
- 45L left first grasping arm
- 46L left second grasping arm
- 47L left second rotating boss portion
- 48L left second annular engagement portion
- 49L left second cam surface
- U user

CLAIMS

- [Claim 1] A massage unit comprising:
- a pair of left and right massage members provided on a base; and
 - a drive mechanism configured to generate a kneading motion on a treatment region by causing the pair of left and right massage members to move toward and away from each other, wherein
- the massage members disposed in a left-and-right pair each include
 - an arm portion whose proximal end is supported by the base via the drive mechanism,
 - a support shaft provided at a distal end and on an inner side, in a left-right direction, of the arm portion so as to intersect a longitudinal direction of the arm portion,
 - a first treatment component supported by the support shaft so as to be movable along the support shaft, and
 - an elastic member that biases the first treatment component inward in the left-right direction, and
 - in response to a load applied to the first treatment component, the elastic member elastically deforms, and the first treatment component is allowed to move outward in the left-right direction along the support shaft.
- [Claim 2] The massage unit according to claim 1, wherein the elastic member is a coil spring wound around an outer peripheral surface of the support shaft about an axis of the support shaft.
- [Claim 3] The massage unit according to claim 2, wherein
- a recess portion is formed in the first treatment component,
 - the recess portion is fitted onto the support shaft in a clearance-fit state, and

an accommodating portion in which an elastic member is disposed is provided between the support shaft and the recess portion.

[Claim 4] The massage unit according to claim 2, wherein
a recess portion is formed in the arm portion,
the support shaft is disposed in the recess portion,
a portion of the first treatment component is slidably fitted into the recess portion,
and

an accommodating portion in which an elastic member is disposed is provided between the recess portion and the portion of the first treatment component.

[Claim 5] The massage unit according to claim 1, wherein
at the distal end of each arm portion provided in the pair of left and right massage members, the arm portion is interposed between the first treatment component and a second treatment component, the first treatment component is provided on an inner side in the left-right direction, and the second treatment component is disposed on an outer side in the left-right direction.

[Claim 6] The massage unit according to claim 5, wherein the second treatment component is supported by the support shaft in a state where movement of the second treatment component in a direction along an axial direction of the support shaft is restricted.

[Claim 7] The massage unit according to claim 1, comprising a grasping massage mechanism configured to perform a grasping massage on the treatment region, wherein
the grasping massage mechanism includes a grasping treatment component

disposed so as to be spaced from the first treatment component in an up-down direction, and causes the grasping treatment component to swing in the up-down direction by means of the drive mechanism.

[Claim 8] A chair-type massage machine comprising:
 a seat portion;
 a backrest portion; and
 the massage unit according to any one of claims 1 to 7 provided in the backrest portion.