

DESCRIPTION

Title of Invention: MASSAGER

Technical Field

[0001] The present invention relates to a massager that performs pressure massage on a massage treatment site ranging from thigh backside through buttocks of a user.

Background Art

[0002] Massager development has been actively pursued in response to various user requests for massage treatment of late years. Recently developed massagers include one capable of massaging user's lower limb (a thigh backside-to-buttocks range, in particular) (refer to Patent Literature 1, for instance).

Prior Art Reference

Citation List

[0003]

Patent Literature 1: Japanese Unexamined Patent

Publication JP-A 2013-248144

Summary of Invention

Technical Problem

[0004] A massaging mechanism mounted in the massager disclosed in Patent Literature 1, while being capable of massaging a massage treatment site ranging from the back side of the thigh (thigh area) through the buttocks of a

user, is configured to be mounted in a large-sized massage chair machine. Thus, the massaging mechanism comprises a thick and large main body (unit).

Among various associated mechanisms, this massaging mechanism is particularly large and structurally complicated, and will inevitably be a space-consuming voluminous component when mounted even in a large-sized massage chair machine. Furthermore, the unit of the massaging mechanism exhibits large actions due to its large thickness.

[0005] However, requests and demands for relatively small and compact massagers have been growing in recent years. That is, there have been growing demands for massagers configured for placement on the seat of a common chair, such as an office chair, to perform massage treatment on a treatment site ranging from the thigh backside through the buttocks of a seated user.

In this regard, the massaging mechanism disclosed in Patent Literature 1 is not adapted for a small-sized massager. For example, as will be understood from FIG. 11, etc. of that patent literature, the large massaging mechanism is structurally complicated, and therefore cannot be easily downsized. Furthermore, it is considered impractical to use the massaging mechanism alone as a massager for the seat of a common chair.

[0006] In view of the drawbacks as discussed supra, an object of the present invention is to provide a massager comprising a massaging mechanism which is small and compact, yet performs effective massage on a treatment site ranging from the thigh backside through the buttocks of a user, and can be securely stored within the massager without causing its massaging elements, etc. to protrude out of the massager.

Solution to Problem

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

A massager embodying the present invention comprises: a massaging mechanism to massage a treatment site of a user; and a seat dimensioned to be wide enough for seating of the user, and including a support frame to house the massaging mechanism. The massaging mechanism applies pressure massage to the treatment site from below upward, while traveling in a front-rear direction.

[0008] In the present invention, it is preferable that the massaging mechanism comprises: a massaging element to massage the treatment site; a massaging body provided at its tip with the massaging element; and a driver to permit advancing-and-retracting movement of the massaging element in a vertical direction.

In the present invention, it is preferable that the

driver comprises: a drive motor to output a rotational driving force; a rotating shaft which has a horizontally-directed axis, and rotates under the outputted rotational driving force; and an advance-and-retraction converter to convert the rotational driving force from the rotating shaft into the advancing-and-retracting movement, and that the massaging element is caused to undergo the advancing-and-retracting movement in the vertical direction by vertical advancing-and-retracting action of the massaging body effected by the advance-and-retraction converter.

[0009] In the present invention, it is preferable that the driver includes a moving mechanism to move the massaging mechanism in the front-rear direction.

In the present invention, it is preferable that the advance-and-retraction converter comprises: a boss member attached to the rotating shaft for eccentric rotation relative to an axis of the rotating shaft; and an annular fit portion disposed at a base end of the massaging body, and fitted onto the boss member, and that the massaging body is caused to advance and retract in the vertical direction by the eccentric rotation of the boss member.

[0010] In the present invention, it is preferable that the drive motor and the rotating shaft are provided as a single drive motor and a single rotating shaft, respectively, and that, with rotatably driving operation of

the single drive motor on the single rotating shaft, the moving mechanism moves the massaging mechanism in the front-rear direction, and the massaging body including the massaging element is caused to undergo the advancing-and-retracting movement in the vertical direction.

In the present invention, it is preferable that the support frame is a flat, rectangularly shaped frame body comprising: first frame members, disposed one on each side of the massaging mechanism in a right-left direction, for supporting the massaging mechanism for travel in the front-rear direction; and second frame members, of which one is mounted so as to span a region between front parts of, respectively, the paired right-hand and left-hand first frame members, and the other is mounted so as to span a region between rear parts of, respectively, the paired right-hand and left-hand first frame members, and that each of the first frame members is provided with a guide rail to guide the massaging mechanism in movement in the front-rear direction.

[0011] In the present invention, it is preferable that the guide rail has one side downwardly inclined, and that, of an internal space defined by the first frame members, a lower space located toward the one side of the guide rail serves as a housing region to house the massaging mechanism.

In the present invention, it is preferable that, when the massaging mechanism in traveling motion is lowered into the housing region for storage, the massaging element is situated below an upper end of each of the first frame members, and that, at the other side of the guide rail opposite the housing region, the massaging element is in a raised position in accordance with an eccentricity of the boss member.

[0012] In the present invention, it is preferable that the massaging mechanism applies the pressure massage to the treatment site, ranging from buttocks through thigh backside of the user, from below upward, while being guided in movement in the front-rear direction by the guide rail.

In the present invention, it is preferable that a main body of the massaging mechanism housing the drive motor and the rotating shaft is situated below the upper end of each of the first frame members.

[0013] In the present invention, it is preferable that the treatment site corresponds to buttocks or thigh of the user.

Advantageous Effects of Invention

[0014] The present invention provides a massager comprising a massaging mechanism which is small and compact, yet performs effective massage on a treatment site ranging from the thigh backside through the buttocks of a

user, and can be securely stored within the massager without causing its massaging elements, etc. to protrude out of the massager.

Brief Description of Drawings

[0015]

FIG. 1 is a perspective view schematically showing a massager embodying the present invention as a whole.

FIG. 2 is a perspective view of the massager with its massaging mechanism set in a housed position.

FIG. 3 is a perspective view of the massager with the massaging mechanism positioned at the rear end thereof.

FIG. 4 is a top perspective view schematically showing a driver as a whole.

FIG. 5 is a bottom perspective view schematically showing the driver as a whole.

FIG. 6 is a perspective view schematically showing an advance-and-retraction converter as a whole.

FIG. 7 is a view showing the travel of the massaging mechanism along a guide rail in a front-rear direction.

FIG. 8 is a view showing a mode of using the massager embodying the present invention.

Description of Embodiments

[0016] An embodiment of a massager 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 out the present invention in practice, and is therefore 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.

Directions with respect to the massager 1, including a front-rear direction and a right-left, or horizontal direction, are as shown in the drawings. These directions coincide with those as viewed from a user sitting on the massager 1 placed on a chair C (e.g. office chair) as shown in FIG. 8. In what follows, the directions indicated in FIGs. 1 to 8, etc. are used as the basis for describing the massager 1 embodying the present invention.

[0017] In FIGs. 1 to 8, there is shown an embodiment of the massager 1 pursuant to the present invention.

As shown in FIGs. 1 and 8, etc., the massager 1 according to this embodiment is placed on the seat of, for example, a chair C or a sofa before use. That is, a user U sits on the massager 1 placed on the seat of the chair C. The user U carries out pressure massage on a treatment site, including at least buttocks T, by actuating a massaging mechanism 2 incorporated in the massager 1.

[0018] The massager 1 comprises: the massaging

mechanism 2 that massages the treatment site, such as the buttocks T, of the user U; and a seat dimensioned to be wide enough for seating of the user U, and including a support frame 3 which is a frame-shaped member for housing the massaging mechanism 2.

The treatment site preferably covers a wide body range extending from the back side of the thigh (thigh area), being simply called thigh backside B, through the buttocks T. Moreover, the support frame 3 (frame body) housing the massaging mechanism 2 is externally covered with a cover material or a cushion material (not shown in the drawings), and the whole of the covered frame body constitutes the seat of the massager 1.

[0019] The support frame 3 is a flat, rectangularly shaped frame body comprising: first frame members 3a, disposed one on each side of the massaging mechanism 2 in the right-left direction, for supporting the massaging mechanism 2 for travel in the front-rear direction; and second frame members 3b, of which one is mounted so as to span the region between the front parts of, respectively, the paired right-hand and left-hand first frame members 3a, and the other is mounted so as to span the region between the rear parts of, respectively, the paired right-hand and left-hand first frame members 3a.

More specifically, the support frame 3 is a low-

profile member shaped like a Japanese floor cushion for comfortable seating of the user U. That is, the support frame 3 is a support body of small thickness having a wide seat-side area. As used herein the term "low-profile" does not encompass a thin member such as a plate material, but denotes a member having a certain degree of thickness such for example as a Japanese floor cushion and a cushion material.

[0020] The area of the support frame 3 is sufficiently wide enough for the user U to sit down on it. In this embodiment, the support frame 3 is about 400 mm in dimension in the front-rear direction (in length), is about 400 mm in dimension in the right-left direction (in width), and is about 100 mm in dimension in the vertical direction (in thickness).

As shown in FIGs. 1 to 3, etc., the support frame 3 comprises constituent members situated forward, rearward, leftward, and rightward, respectively, of the massaging mechanism 2 so as to surround the massaging mechanism 2. That is, the support frame 3 is constructed by combining four rodlike frame members 3a and 3b into a grid-like body, or a body of hollow square-like shape, as a frame body which is rectangular in plan configuration.

[0021] More specifically, the support frame 3 is a rectangular frame body comprising: the first frame members

3a (main frames), disposed one on each side of the massaging mechanism 2 in the right-left direction, for supporting the massaging mechanism 2 for travel in the front-rear direction; and a pair of the second frame members 3b (sub frames), of which the front-located frame member 3b is mounted so as to span the region between the front parts of, respectively, the paired right-hand and left-hand first frame members 3a, and the rear-located frame member 3b is mounted so as to span the region between the rear parts of, respectively, the paired right-hand and left-hand first frame members 3a.

The first frame members 3a (main frames) are each a rodlike member of long dimension oriented in the front-rear direction. The paired first frame members 3a are arranged in the right-left direction, with the massaging mechanism 2 lying in between.

[0022] That is, the first frame members 3a include the left-hand first frame member 3a disposed to the left of the massaging mechanism 2, and the right-hand first frame member 3a disposed to the right of the massaging mechanism 2. Each first frame member 3a is provided with a guide rail 5 (detailed later) for guiding the massaging mechanism 2 in movement in the front-rear direction, etc.

The first frame member 3a is longer at the sides in the vertical direction than at the sides in the horizontal

direction as seen in sectional view. The first frame member 3a is given a certain degree of width, or dimension in the right-left direction (thickness) for supporting the massaging mechanism 2 with stability.

[0023] In this embodiment, the first frame member 3a is about 400 mm in length (dimension in the front-rear direction), is about 100 mm in height (dimension in the vertical direction), and is about 40 mm in width.

Moreover, the first frame member 3a (main frame) has one side face formed with a guide slot 4 elongated in the front-rear direction. The guide slot 4 opens into the massaging mechanism 2-facing side face of the first frame member 3a.

[0024] For example, the left-hand first frame member 3a is provided at its right side face with the guide slot 4, whereas the right-hand first frame member 3a is provided at its left side face with the guide slot 4. That is, the openings of the guide slots 4 of the right-hand and left-hand first frame members 3a are opposed to each other with the massaging mechanism 2, which lies inside the support frame 3, located between them.

Each of the guide slots 4 is stepped to define a stepped recess in the horizontal (widthwise) direction of the first frame member 3a. This guide slot 4 receives the guide rail 5 which will hereafter be described. Moreover,

the bottom face of the guide slot 4 (the surface of the stepped recess) is provided with a first guide slot 6 and a second guide slot 7 that will be detailed later.

[0025] The first guide slot 6 and the second guide slot 7 each have an opening facing toward the massaging mechanism 2.

The second guide slot 7 is situated above the first guide slot 6. That is, the first guide slot 6 and the second guide slot 7 are arranged in the vertical direction.

Of these guide slots, the first guide slot 6 is provided at its opening edge with the guide rail 5 in adjacent relation. The first guide slot 6 and the second guide slot 7 are members constituting a moving mechanism 15 (detailed later) for guiding the massaging mechanism 2 in movement in the front-rear direction.

[0026] On the other hand, the second frame members 3b (sub frames) are each a rodlike member of long dimension oriented in the right-left direction. The paired second frame members 3b are arranged in the front-rear direction, with the massaging mechanism 2 lying in between.

The second frame members 3b are each mounted in intersecting relation (orthogonal) to the first frame member 3a (main frame). That is, the second frame members 3b include the front-located second frame member 3b that fixedly couples the front ends of, respectively, the right-

hand and left-hand first frame members 3a together, and the rear-located second frame member 3b that fixedly couples the rear ends of, respectively, the paired right-hand and left-hand first frame members 3a together. The support frame 3, being constructed of the second frame members 3b and the first frame members 3a, can be mounted as a sturdy frame body.

[0027] In this embodiment, the second frame member 3b is about 400 mm in length (in dimension in the horizontal direction of the support frame 3). Note that the width and height of the second frame member 3b may be suitably changed as required.

The lower limb, or leg (such as the thigh and the knee) of the user U sitting on the massager 1 abuts on the front-located second frame member 3b. Thus, the front-located second frame member 3b is preferably made thinner (slimmer) than the first frame member 3a. Moreover, both the front-located second frame member 3b and the rear-located second frame member 3b are preferably positioned below a massaging element provided in the massaging mechanism 2.

[0028] Thus constructed of the first frame members 3a and the second frame members 3b, the support frame 3 has the form of a frame body which is rectangular (substantially square-shaped) in plan configuration.

Disposed centrally of the support frame 3 is the massaging mechanism 2 that performs pressure massage on that part of the body of the user U ranging from the thigh backside B through the buttocks T (treatment site).

The massaging mechanism 2 is configured to perform pressure massage on the treatment site (such as the thigh backside B and the buttocks T) of the seated user U by moving from below upward for advancing-and-retracting motion while traveling in the front-rear direction. In this embodiment, the massaging mechanism 2 can be said to be a buttocks-massaging mechanism.

[0029] The massaging mechanism 2 is disposed on a base 8. The base 8 is a member elongated in the right-left direction. The base 8 is mounted so as to span the region between the paired right-hand and left-hand first frame members 3a. The base 8 is movable in the front-rear direction. That is, the massaging mechanism 2 is coupled at its right and left ends to the support frame 3 (the first frame members 3a) via the moving mechanism 15, which will hereafter be described, for travel in the front-rear direction.

[0030] The massaging mechanism 2 comprises: a massaging element 9 that massages the treatment site; a massaging body 10 provided at its tip with the massaging element 9; and a driver 11 that effects advancing-and-

retracting movement of the massaging element 9 (the massaging body 10) in the vertical direction, and also moves the massaging mechanism 2 in the front-rear direction within the support frame 3 (frame body).

The driver 11 is disposed on the above-described base 8. The driver 11 comprises: a drive motor 12 that outputs a rotational driving force; a rotating shaft 13 which has a horizontally-directed axis, and rotates under the rotational driving force outputted by the drive motor 12; a converter for advancing and retracting action 14, being simply called advance-and-retraction converter 14, that converts the rotational driving force from the rotating shaft 13 into eccentric motion for advancing and retracting action (eccentric-motion converter); and the moving mechanism 15 that moves the massaging mechanism 2 in the front-rear direction.

[0031] As shown in FIGs. 1 to 5, etc., the drive motor 12 is located centrally of the base 8 in the right-left direction, and located toward the front side of the base 8. The drive motor 12 has a horizontally-directed output shaft 12a (a rightward output shaft 12a in this embodiment). The output shaft 12a is fitted with a first worm gear 18 of a speed reducing mechanism 16, and, both the output shaft 12a and the first worm gear 18 are rotatable.

The speed reducing mechanism 16 is stored inside a

gear case 17 disposed on the base 8. The speed reducing mechanism 16 comprises the first worm gear 18, a first worm wheel 19, a power transmission shaft 20, a second worm gear 21, a second worm wheel 22, etc.

[0032] The first worm gear 18 has a meshing engagement with the first worm wheel 19 situated therebelow. The first worm wheel 19 is attached to the front part of the power transmission shaft 20.

The power transmission shaft 20 is disposed perpendicularly with respect to the output shaft 12a situated thereabove (oriented in the front-rear direction).

The power transmission shaft 20 is rotatably supported via a bearing 23 on the base 8. The power transmission shaft 20 is fitted at its rear part with the second worm gear 21. The second worm gear 21 and the first worm wheel 19 rotate together with the power transmission shaft 20.

[0033] The second worm gear 21 has a meshing engagement with the second worm wheel 22 situated thereabove. The second worm wheel 22 is attached to a lengthwise intermediate part of the rotating shaft 13, and rotates together with the rotating shaft 13.

The rotating shaft 13 has a horizontally-directed axis, and is located centrally of the base 8. The rotating shaft 13 is disposed perpendicularly with respect to the

power transmission shaft 20 situated therebelow (oriented in the right-left direction).

[0034] The rotating shaft 13 is rotatably supported via a bearing 23 on the base 8. Moreover, the rotating shaft 13 is disposed perpendicularly with respect to the power transmission shaft 20 (oriented in the right-left direction).

The rotational driving force outputted from the output shaft 12a of the drive motor 12 is transmitted, through the speed reducing mechanism 16 disposed inside the gear case 17, to the rotating shaft 13. Thus, the rotating shaft 13 is driven to rotate about the horizontally-directed axis under the rotational driving force produced by the drive motor 12.

[0035] In this embodiment, the massager includes a single drive motor 12 and a single rotating shaft 13. That is, in the massager 1 according to this embodiment, with the rotatably driving operation of the single drive motor 12 for the single rotating shaft 13, the moving mechanism 15, which will hereafter be described, moves the massaging mechanism 2 in the front-rear direction, and, the advance-and-retraction converter 14, which will hereafter be described, permits eccentric rotation of the massaging body 10 in the vertical direction, thereby causing the massaging element 9 disposed at the tip of the massaging body 10 to

advance and retract in the vertical direction. That is, the massaging element 9 moves both in the front-rear direction and in the vertical direction so as to follow an undulatory path pattern.

[0036] The rotating shaft 13 is provided with the advance-and-retraction converters 14 located to the left and the right, respectively, of the second worm wheel 22. The advance-and-retraction converter 14 converts the rotational driving force on the rotating shaft 13 into the vertical advancing-and-retracting movement of the massaging body 10. The advance-and-retraction converter 14 is disposed at the base end of the massaging body 10.

The massaging body 10 is disposed on the base 8. There is provided a pair of massaging bodies 10 spaced apart in the right-left direction. The conversion of the rotational driving force on the rotating shaft 13 into eccentric motion enables the massaging bodies 10 to move from below upward for advancing-and-retracting motion.

[0037] The massaging body 10 comprises a forwardly-extended front arm member 24, and a rearwardly-extended rear arm member 25. The front arm member 24 and the rear arm member 25 are coupled together at their base ends where the advance-and-retraction converter 14 is disposed. The massaging body 10 is a substantially T-shaped member as seen in side view.

Moreover, the massaging body 10 rotates about the axis of the rotating shaft 13 without being restrained in movement (free-moving state). That is, in this embodiment, the massaging body 10 is not provided with urging means (restraining means), such as a spring, that causes the massaging body 10 to return to its original position by repulsion.

[0038] Thus constructed, the massaging body 10 moves smoothly in the front-rear direction along the shape of the thigh backside B-to-buttocks T area of the user U. Consequently, with the massaging element 9 traveling in the front-rear direction, the massaging body 10 performs satisfactory pressure massage on the thigh backside B-to-buttocks T area of the user U.

The massaging element 9 to massage (treat) the treatment site of the user U is disposed at each of the tip (front end) of the front arm member 24 and the tip (rear end) of the rear arm member 25. The massaging element 9 applies pressure massage to the thigh backside B-to-buttocks T area of the user U (treatment site) from below upward. That is, the massaging element 9 is caused to advance and retract in the vertical direction by the vertical eccentric movement of the massaging body 10 attained through the operation of the advance-and-retraction converter 14.

[0039] In this embodiment, each of those arm members is provided at its tip with a shaft portion 26 having a horizontally-directed axis (an axis directed in the same direction as the rotating shaft 13). Moreover, the massaging element 9 has the form of a rotatable roller which is mounted for rotation about the axis of the shaft portion 26. That is, in this embodiment, the massaging element 9 rolls smoothly along the treatment site ranging from the thigh backside B through the buttocks T of the user U during the travel of the massaging mechanism 2 in the front-rear direction.

[0040] That is, in this embodiment, the massaging mechanism 2 permits pressing massage (pressure massage) by repeating the pressing of the massaging element 9 against the treatment site of the seated user U from below upward through the vertical advancing-and-retracting action of the massaging body 10.

While, in this embodiment, the massaging mechanism 2 is configured to perform massage on the treatment site by repeated application of pressure to the treatment site, the massaging mechanism 2 may alternatively be configured to perform massage such as to stretch the muscle of the thigh backside B, or to perform massage by the combined use of various massaging actions.

[0041] As shown in FIG. 6, the advance-and-retraction

converter 14 converts the rotational driving force on the rotating shaft 13 into eccentric rotation, thereby imparting vertical advancing-and-retracting motion to the massaging element 9 of the massaging body 10. This advance-and-retraction converter 14 (eccentric-motion converter) comprises: a boss member 27 attached to the rotating shaft 13 for eccentric rotation relative to the axis of the rotating shaft 13; and an annular fit portion 28 disposed at the base end of the massaging body 10, and fitted onto the boss member 27.

[0042] That is, in the advance-and-retraction converter 14, the eccentric rotation of the boss member 27 (eccentric boss member) about the axis of the rotating shaft 13 enables the annular fit portion 28 to move in the vertical direction, thereby causing the massaging body 10 to advance and retract in the vertical direction, with the consequent vertical advancing-and-retracting movement of the massaging element 9.

The eccentric boss member 27 is mounted for unitary rotation with the rotating shaft 13. The eccentric boss member 27 is provided at its outer periphery with a cam surface 27a which moves, while eccentrically rotating, around the axis of the rotating shaft 13. The cam surface 27a of the eccentric boss member 27 is externally fitted with the annular fit portion 28 which is free to slide.

[0043] While the axis of the eccentric boss member 27 is directed in the same direction as the axis of the rotating shaft 13 (horizontal direction), the eccentric boss member 27 is not in axial alignment with the rotating shaft 13. That is, the axis of the eccentric boss member 27 is parallel to the axis of the rotating shaft 13. Moreover, in this embodiment, the eccentric boss member 27 has the form of two split bodies arranged so as to hold the annular fit portion 28 from both sides in the right-left direction.

 The annular fit portion 28, which is ring-shaped as seen in side view, is formed at the base end (lower end) part of the massaging body 10 (arm member). The annular fit portion 28 fits onto the cam surface 27a of the eccentric boss member 27.

[0044] The annular fit portion 28 and the eccentric boss member 27 are mounted for relative rotation, and convert the rotational movement of the rotating shaft 13 into eccentric rotation for conversion to the vertical advancing-and-retracting movement of the massaging body 10. That is, as the eccentric boss member 27 eccentrically rotates while sliding within the annular fit portion 28, the annular fit portion 28 moves in the vertical direction, thereby causing the massaging body 10 to advance and retract in the vertical direction, with the consequent

vertical advancing-and-retracting movement of the massaging element 9.

[0045] The eccentric boss member 27 and the annular fit portion 28 are preferably made of a less-wearing material, e.g. fluorine resin such as polytetrafluoroethylene (PTFE) resin.

The massaging body 10 is provided at its base end with the annular fit portion 28, and comprises the rodlike front arm member 24 extended obliquely upwardly in the forward direction from the base end, and the rodlike rear arm member 25 extended obliquely upwardly in the backward direction from the base end. That is, the advance-and-retraction converter 14 is disposed at the base end of the massaging body 10.

[0046] Moreover, the front arm member 24 is provided at its front end with the massaging element 9 that massages the treatment site. Likewise, the rear arm member 25 is provided at its rear end with the massaging element 9 that massages the treatment site. These massaging elements 9 each have the form of a roller which rotates about the axis of the shaft portion 26.

That is, in this embodiment, there are provided four roller-shaped massaging elements 9 each disposed at the tip of the corresponding arm member 24, 25. Each massaging element 9 rolls smoothly along the treatment site ranging

from the thigh backside B through the buttocks T of the user U during the travel in the front-rear direction.

[0047] Such a converting operation of the advance-and-retraction converter 14 (the conversion of the rotational movement of the rotating shaft 13 into vertical advancing-and-retracting motion) permits a repeat of vertical advancing-and-retracting movement of the massaging body 10, thereby causing the massaging element 9 to move up and down while traveling back and forth in the front-rear direction so as to follow an undulatory path pattern. That is, the advance-and-retraction converter 14 and the massaging body 10 operate to impart upwardly pressing action and downwardly withdrawing action to the massaging element 9 in back-and-forth traveling motion repeatedly at predetermined intervals.

[0048] The massager 1 embodying the present invention includes the moving mechanism 15 that enables the massaging mechanism 2 to move in the front-rear direction relative to the support frame 3. The moving mechanism 15 comprises: the guide rail 5 attached to the first frame member 3a (main frame); and a traveling element 29 configured for travel on the guide rail 5.

As shown in FIGs. 4 and 5, etc., the guide rail 5 is attached to the first frame member 3a so as to extend in the front-rear direction. The guide rail 5, which is a

rail member for guiding the massaging mechanism 2 in movement in the front-rear direction, is fitted along the lower opening edge in the guide slot 4 of the first frame member 3a. The guide rail 5 is disposed adjacent the first guide slot 6. That is, the guide rail 5 and the first guide slot 6 are mounted in communication with each other.

[0049] Moreover, the guide rail 5 is provided at its upper surface with a rack gear 30 having teeth pointing in the front-rear direction. Thus, in this embodiment, the traveling element 29 is formed as a pinion gear 29 having a meshing engagement with the rack gear 30 of the guide rail 5.

There are provided two pinion gears 29 disposed one on each side of the massaging mechanism 2 in the right-left direction. That is, the pinion gear 29 is rotatably attached to each of the right and left ends of the rotating shaft 13, and travels, while rotating, on the rack gear 30 in the front-rear direction. Moreover, the pinion gear 29 rotates under the rotational driving force on the rotating shaft 13 while being subjected to deceleration to a predetermined rate by a speed changing mechanism 31.

[0050] The speed changing mechanism 31 is located inwardly of the pinion gear 29. There are provided two speed changing mechanisms 31 disposed one at each end of the rotating shaft 13 in the right-left direction. The

speed changing mechanism 31 is stored inside a gear case 32 disposed on the base 8. The speed changing mechanism 31 comprises a first gear 33, a driven shaft 34, a second gear 35, a third gear 36, a fourth gear 37, etc.

The first gear 33 is rotatably attached to each of the right and left end parts of the rotating shaft 13. The first gear 33 has a meshing engagement with the second gear 35 situated forward of it. The second gear 35 is rotatably attached to the driven shaft 34. The driven shaft 34 is disposed forward of and in parallel with the rotating shaft 13 (oriented in the right-left direction).

[0051] Disposed outwardly of the second gear 35 is the third gear 36 which is rotatably attached to the driven shaft 34. That is, the second gear 35 and the third gear 36 are disposed adjacent each other. The third gear 36 has a meshing engagement with the fourth gear 37 situated behind it.

The fourth gear 37 is located outwardly of the first gear 33, and rotatably attached to the rotating shaft 13. In this embodiment, the fourth gear 37 is molded integral with the pinion gear 29. Thus, the pinion gear 29 and the fourth gear 37 are unitarily rotated.

[0052] That is, the rotational driving force on the rotating shaft 13 passes through the first gear 33, the second gear 35, the third gear 36, and the fourth gear 37

(through the speed changing mechanism 31) for deceleration to a predetermined rate, thereby causing the pinion gear 29 to travel, while rotating, on the rack gear 30 in the front-rear direction. This enables the massaging mechanism 2 to travel along the guide rail 5 in the front-rear direction.

Thus, the massaging mechanism 2 applies pressure massage to the treatment site ranging from the buttocks T through the thigh backside B of the user U from below upward, while being guided in movement in the front-rear direction by the guide rail 5 (the moving mechanism 15).

[0053] The guide rail 5 (the rack gear 30) has one side downwardly inclined. In this embodiment, the guide rail 5 (the rack gear 30) is gradually downturned from the rear to the front of the massager. That is, the guide rail 5 (the rack gear 30) is formed as a curved rail having a downwardly-bent front end. Correspondingly, the first guide slot 6 and the second guide slot 7 are each shaped as a curved rail bent at its front end.

[0054] The guide rail 5 (the rack gear 30), the first guide slot 6, and the second guide slot 7 are formed as curved rails having their front ends inclined downwardly at the same angle. This allows a space for housing the massaging mechanism 2 to be formed in a lower place in the interior front part of the support frame 3 (frame body).

That is, of the internal space defined between the paired right-hand and left-hand first frame members 3a, the lower space located toward the front side of the guide rail 5 (the rack gear 30) serves as a housing region S to house the massaging mechanism 2.

[0055] The guide rail 5 (the rack gear 30) is provided at its front end with an inclined portion 38 which is gradually inclined downwardly toward the front. For the positioning of the inclined portion 38 (the point from which the front end extends at a downward incline, i.e. start point in the bend range), the guide rail 5 (the rack gear 30) is preferably bent at a point thereof spaced from the front end of the first frame member 3a (the support frame 3) by a distance equal to about 30 percent of the entire length of the first frame member 3a in the front-rear direction.

[0056] Moreover, the downwardly extending amount of the inclined portion 38 (corresponding to vertical travel distance) is preferably equal to at least about one-half of the outside diameter of the massaging element 9, or more preferably substantially equal to the outside diameter of the massaging element 9 at a maximum. That is, the downwardly extending amount and the angle of inclination of the inclined portion 38 are preferably determined so that the massaging element 9 can be angularly moved to a non-

projected position where it is situated below the upper end of the support frame 3 (the first frame member 3a) as seen in side view.

[0057] Likewise, the first guide slot 6 comprises an inclined portion 39 inclined downwardly at the same angle as the angle of inclination of the inclined portion 38, and the second guide slot 7 also comprises an inclined portion 40 inclined downwardly at the same angle as the angle of inclination of the inclined portion 38. That is, the forward region with respect to the inclined portions 38 to 40 defines the massaging mechanism 2-housing region S. The housing region S serves for the massaging mechanism 2 to be entirely stored within the lower place.

[0058] The setting of the angle of inclination and the start point of downward incline (start point in the bend range) in each of the inclined portion 39 of the first guide slot 6 and the inclined portion 40 of the second guide slot 7 is made in the same manner as that for the inclined portion 38 so as to ensure that the massaging mechanism 2 moves downward while maintaining its horizontal position.

As described above, the guide rail 5 (the rack gear 30) comprises the inclined portion 38 designed thoughtfully in respect of inclination angle, downwardly extending amount, etc. Moreover, the first guide slot 6 and the

second guide slot 7 comprise the inclined portion 39 and the inclined portion 40, respectively, that are each similar in inclination angle, downwardly extending amount, etc. to the inclined portion 38. This arrangement enables the massaging mechanism 2 to move obliquely downward in the forward direction, while maintaining its horizontal position, for retraction into the housing region S defined by the lower place located toward the front side of the guide rail 5.

[0059] For example, when the pinion gear 29 running forward on the rack gear 30 (the guide rail 5) is moved to the lower end (tip) of the inclined portion 38, a first roller member 44 (detailed later) running within the first guide slot 6 is moved to the lower end (tip) of the inclined portion 39, and a second roller member 45 (detailed later) running within the second guide slot 7 is moved to the lower end (tip) of the inclined portion 40. Consequently, the massaging mechanism 2 is moved obliquely downward in the forward direction, while maintaining its horizontal position, for retraction into the housing region S.

[0060] Then, the massaging body 10 is moved downward through the operation of the advance-and-retraction converter 14, whereupon the massaging element 9 assumes a non-projected position where it is situated below the upper

end of the first frame member 3a (the support frame 3) as seen in side view (refer to FIG. 2 and FIG. 7(a)).

Thus, the massaging mechanism 2 is housed in the housing region S within the support frame 3 without fail. Having the housing region S for housing the massaging mechanism 2 completely in the lower place, the massager 1 increases the comfort of the user U sitting on it.

[0061] While, in this embodiment, the massaging mechanism 2-housing region S is positioned in the interior front part of the support frame 3 as a desirable location, the housing region S may alternatively be positioned in the interior rear part of the support frame 3.

The rack gear 30 (the guide rail 5) is provided at its rear part with a downwardly-curved concave rail portion 41. The concave rail portion 41 enables the massaging element 9 to move downward away from the treatment site temporarily during the backward movement of the massaging mechanism 2 caused by the backward travel of the pinion gear 29 on the rack gear 30. That is, the concave rail portion 41 temporarily lowers the position of the massaging element 9 to below the upper end of the support frame 3.

[0062] The concave rail portion 41 is obtained by bending a rear part of the rack gear 30 (the guide rail 5) downwardly in arcuate form. That is, the rack gear 30 has a rear part shaped like a downwardly curved bulge.

Likewise, the first guide slot 6, disposed adjacent in communicating relation to the guide rail 5, is also provided at its part corresponding to the concave rail portion-forming part of the guide rail 5 with a downwardly-curved concave guide portion 42. That is, the first guide slot 6 comprises the concave guide portion 42 defining a track curved downwardly in conformity with the shape of the concave rail portion 41.

[0063] The concave rail portion 41 provided in the rack gear 30 (the guide rail 5) and the concave guide portion 42 provided in the first guide slot 6 help keep the bone of the user U protruding downwardly within the buttocks T (sit bone) clear of the massaging element 9 during the operation to perform pressure massage on the treatment site such as the buttocks T of the user U sitting on the massager 1. That is, this arrangement minimizes painful discomfort to the user U caused by the pressing of the massaging element 9 against the sit bone.

[0064] Moreover, the massager 1 according to this embodiment includes a posture-retaining mechanism 43 that holds the massaging mechanism 2 in a stable posture (horizontal position) during its travel in the front-rear direction. That is, the posture-retaining mechanism 43 supports the massaging mechanism 2 at a plurality of points thereof for postural stability of the massaging mechanism 2

in traveling motion in the front-rear direction.

As shown in FIGs. 1 to 5, etc., the posture-retaining mechanism 43 comprises: the first guide slot 6 formed in the first frame member 3a; the first roller member 44 (the first traveling element) which travels within the first guide slot 6; the second guide slot 7 situated above the first guide slot 6; and the second roller member 45 (the second traveling element) which travels within the second guide slot 7.

[0065] There are provided two first roller members 44 (first slider members) disposed one at each end of the rotating shaft 13 in the right-left direction. That is, the first roller member 44 is located outwardly of the pinion gear 29 attached to the rotating shaft 13. The first roller member 44 is slidably fitted within the first guide slot 6, and travels in the front-rear direction.

The first guide slot 6 is a long groove defining a track identical with the track of the adjacent rack gear 30 (the guide rail 5). That is, the first guide slot 6 comprises a track having a front end gradually inclined downwardly toward the front (the inclined portion 39), and a rearwardly extending horizontal track communicating with that inclined track. The horizontal track of the first guide slot 6 includes the concave guide portion 42 gently curved downwardly in conformity with the shape of the

concave rail portion 41.

[0066] The second roller member 45 (the second slider member) is situated forward of the first roller member 44. The second roller member 45 is attached to a projecting piece 46 located toward the front end of the base 8. The projecting piece 46 is a rodlike member protruding upwardly and outwardly in the horizontal direction from the front end of the base 8. The projecting piece 46 is provided at its tip with the second roller member 45.

That is, the second roller member 45 is positioned above a location forward of the first roller member 44. The second roller member 45 is slidably fitted within the second guide slot 7, and travels in the front-rear direction.

[0067] The second guide slot 7 is a long groove defining substantially the same track as that of the first guide slot 6. The second guide slot 7 is spaced upwardly from the first guide slot 6, and located closer to the front than the first guide slot 6. That is, the second guide slot 7 comprises a track having a front end gradually inclined downwardly toward the front (the inclined portion 40), and a rearwardly extending horizontal track communicating with that inclined track.

The inclined portion 40 of the second guide slot 7 is positioned above a location forward of the inclined portion

39 of the first guide slot 6. Note that the rear end part of the second guide slot 7 is not formed with a track curved in conformity with the shape of the concave rail portion 41.

[0068] The massaging mechanism 2 travels in the front-rear direction with its posture (horizontal position) stably maintained by the first roller member 44 fitted within the first guide slot 6 for sliding motion in the front-rear direction, and the second roller member 45 fitted within the second guide slot 7 for sliding motion in the front-rear direction.

[Operation Mode]

Now, the mode of operating the massager 1 embodying the present invention will be described with reference to the drawings.

[0069] FIGs. 7(a) to 7(d) are views sequentially showing, in top-to-bottom order, the stepwise movement of the massaging mechanism 2 from the housing region S located toward the front end of the massager toward the rear end of the massager.

FIG. 7(a) is a view showing a condition where the massaging mechanism 2 lies in the housing region S located toward the front side of the guide rail 5. FIG. 7(b) is a view showing a condition where the now upwardly protruding massaging element 9 is performing pressure massage on the

treatment site.

[0070] FIG. 7(c) is a view showing a condition where the pinion gear 29 lies in the concave rail portion 41, and the first roller member 44 lies in the concave guide portion 42 of the first guide slot 6. FIG. 7(d) is a view showing a condition where the massaging element 9 assumes a fully raised position at the rear side of the guide rail 5.

In the operating condition shown in FIG. 7(a), when the pinion gear 29 lies at the front end of the inclined portion 38 of the rack gear 30 (the guide rail 5), then the first roller member 44 lies in the inclined portion 39 of the first guide slot 6, and the second roller member 45 lies in the inclined portion 40 of the second guide slot 7.

[0071] That is, the massaging mechanism 2 lies in the housing region S located toward the front side of the guide rail 5. At this time, the massaging body 10 assumes a lowermost position through the operation of the advance-and-retraction converter 14 (refer to the height L (lowermost position) shown in FIG. 7(a)). Correspondingly, the massaging element 9 assumes a lowermost position. The massaging mechanism 2 is preferably controlled in the manner as above described.

Moving from the rear to the front, the massaging mechanism 2 is lowered into the housing region S for storage. Then, the massaging element 9 is situated below

the upper end of the first frame member 3a (the support frame 3).

[0072] As the rotating shaft 13 rotates under the rotational driving force from the drive motor 12, the pinion gear 29 moves backward from the inclined portion 38 while traveling on the rack gear 30 of the guide rail 5. This causes the first roller member 44 to move backward from the inclined portion 39 of the first guide slot 6, and also causes the second roller member 45 to move backward from the inclined portion 40 of the second guide slot 7.

At this time, the massaging mechanism 2 rises with its horizontal position maintained by the posture-retaining mechanism 43 comprising the first roller member 44, the second roller member 45, etc. That is, the massaging body 10 rises with accompanying upward movement of the massaging element 9 toward the upper end of the support frame 3.

[0073] When the pinion gear 29 is moved to the horizontal portion of the rack gear 30 (the guide rail 5) over the inclined portion 38, then the first roller member 44 is moved to the horizontal portion (horizontal track) of the first guide slot 6 over the inclined portion 39, and similarly the second roller member 45 is moved to the horizontal portion (horizontal track) of the second guide slot 7 over the inclined portion 40. Consequently, the massaging mechanism 2 changes its position to the position

shown in FIG. 7(b).

[0074] In the operating condition shown in FIG. 7(b), the rotation of the rotating shaft 13 causes the pinion gear 29 to travel on the horizontal portion (horizontal track) of the rack gear 30 (the guide rail 5). At this time, the first roller member 44 lies in a location intermediate the ends of the first guide slot 6 (horizontal track) in the front-rear direction, and the second roller member 45 lies in a location intermediate the ends of the second guide slot 7 (horizontal track) in the front-rear direction.

[0075] Thus, the massaging mechanism 2 travels with its posture (horizontal position) kept unchanged by the posture-retaining mechanism 43 comprising the first roller member 44, the second roller member 45, etc.

In this condition, the massaging element 9 has undergone postural change to protrude upward beyond the upper end of the support frame 3. The now protruding massaging element 9 stands ready for pressure massage to the treatment site of the user U without fail.

[0076] Moreover, the front massaging element 9 and the rear massaging element 9 move backward while maintaining their horizontal positions approximately level with each other. In this condition, the massaging body 10, which rotates about the axis of the rotating shaft 13 without

being restrained in movement (free-moving state), travels back and forth in the front-rear direction while moving smoothly in the front-rear direction along the shape of the thigh backside B-to-buttocks T area of the user U. Thus, with the back-and-forth travel of the massaging element 9 in the front-rear direction, satisfactory pressure massage can be performed on the treatment site of the user U.

[0077] That is, the converting operation of the advance-and-retraction converter 14 (the conversion of the rotational movement of the rotating shaft 13 into vertical advancing-and-retracting motion) permits a repeat of vertical advancing-and-retracting movement of the massaging body 10, thereby causing the massaging element 9 to move up and down while traveling back and forth in the front-rear direction so as to follow an undulatory path pattern.

That is, with the operation to impart upwardly pressing action and downwardly withdrawing action to the massaging element 9 in back-and-forth traveling motion repeatedly at predetermined intervals, satisfactory pressure massage can be performed on the thigh backside B-to-buttocks T area of the user U (treatment site).

[0078] When the pinion gear 29 is moved to the concave rail portion 41 of the rack gear 30 (the guide rail 5), the massaging mechanism 2 changes its position to the position shown in FIG. 7(c).

In the operating condition shown in FIG. 7(c), when the pinion gear 29 traveling on the rack gear 30 (horizontal track) enters the concave rail portion 41, the first roller member 44 disposed adjacent the pinion gear 29 enters the concave guide portion 42 provided in the first guide slot 6. Note that the second roller member 45 lies on the linear portion (horizontal track) of the second guide slot 7; wherefore the height of the second roller member 45 remains unchanged.

[0079] That is, the rear-located pinion gear 29 enters the concave rail portion 41 for downward motion, and also the first roller member 44 enters the concave guide portion 42 for downward motion. On the other hand, the front-located second roller member 45 moves rectilinearly backward, and thus maintains its higher position. Consequently, the massaging mechanism 2 assumes a rearwardly tilted position.

At this time, the front massaging element 9 protrudes slightly upward beyond the upper end of the support frame 3, whereas the rear massaging element 9 is in a lowered position well below the upper end of the support frame 3.

[0080] That is, with the downward sinking movement of the rear massaging element 9 alone to below the upper end of the support frame 3, the sit bone of the user U is clear of the rear massaging element 9. Moving further backward,

the massaging mechanism 2 changes its position to the position shown in FIG. 7(d).

In the operating condition shown in FIG. 7(d), the pinion gear 29 has reached the rear end of the guide rail 5 after moving backward from the concave rail portion 41. At this time, the first roller member 44 has reached the rear end of the first guide slot 6 after moving backward from the concave guide portion 42, and the second roller member 45 has reached the rear end of the second guide slot 7 after moving rectilinearly backward.

[0081] The posture (horizontal position) of the massaging mechanism 2 is kept unchanged by the posture-retaining mechanism 43 comprising the first roller member 44, the second roller member 45, etc. In this condition, the massaging element 9 has undergone postural change for protruding upward beyond the upper end of the support frame 3 to attain a fully upwardly-projected position.

That is, reaching the rear side (the other side) of the guide rail 5 opposite the housing region S, the massaging body 10 assumes an uppermost position through the operation of the advance-and-retraction converter 14 (refer to the height H (uppermost position) shown in FIG. 7(d)). Correspondingly, the massaging element 9 assumes a fully raised position. The massaging mechanism 2 is preferably controlled in the manner as above described. The now

protruding massaging element 9 stands ready to perform pressure massage on the buttocks T of the user U while moving along the shape of the buttocks T.

[0082] The massaging body 10 does not necessarily have to assume the uppermost position at the rear side of the guide rail 5. It is essential only that the massaging body 10 be raised by a distance corresponding to the eccentricity of the boss member 27, e.g. a distance equal to about two-thirds of the eccentric amount of the boss member 27.

 In this condition, the massaging body 10, which rotates about the axis of the rotating shaft 13 without being restrained in movement (free-moving state), travels backward while moving smoothly along the shape of the buttocks T of the user U. Thus, with the backward travel of the massaging element 9, satisfactory pressure massage can be performed on the buttocks T of the user U.

[0083] For the storage of the massaging mechanism 2, the described operation is reversed in sequence. That is, the massaging mechanism 2 is operated to go through the movement steps (d), (c), (b), and (a) shown in FIG. 7 in the order presented. Moving from the rear to the front in this way, the massaging mechanism 2 is lowered into the housing region S for storage. Then, the massaging element 9 is situated below the upper end of the first frame member

3a (the support frame 3).

[0084] The controller of the massager 1 preferably exercises control in a manner such that, when the massaging mechanism 2 lies in the housing region S, the eccentric position of the eccentric boss member 27 is set to the lowermost position L for lowering the massaging element 14 into the support frame 3 without causing it to protrude upward.

Moreover, the controller of the massager 1 preferably exercises control in a manner such that the massaging element 14 moves up and down repeatedly during the travel of the massaging mechanism 2 in the front-rear direction.

[0085] Also, the controller of the massager 1 preferably exercises control in a manner such that, when the massaging mechanism 2 reaches a rear end position, the eccentric position of the eccentric boss member 27 is set to the uppermost position H for moving the massaging element 14 to the fully upwardly-projected position.

Such a control operation ensures massage treatment to the thigh backside B-to-buttocks T area of the user U (treatment site), and also ensures storage of the massaging mechanism 2 in the housing region S within the support frame 3.

[0086] The stopping position of the massaging mechanism 2 in back-and-forth motion in the front-rear

direction (such for example as stopping of the driver 11 in the housing region S) is preferably determined by means of a position detector 47 that detects the position of the massaging mechanism 2.

For example, for detection of the stopping position of the massaging mechanism 2 in back-and-forth motion in the front-rear direction, a sensor, such as a limit switch, is desirable for use as the position detector 47.

[0087] Also, the stopping position of the massaging body 10 in advancing-and-retracting motion in the vertical direction (such for example as stopping of the rotating operation of the advance-and-retraction converter 14 in the housing region S where the massaging element 9 assumes the lowermost position, and stopping of the rotating operation of the advance-and-retraction converter 14 at the rear end of the massager where the massaging element 9 assumes the uppermost position) is preferably determined by means of a position detector 47 that detects the position of the massaging mechanism 2.

For example, for detection of the stopping position of the massaging body 10 in advancing-and-retracting motion in the vertical direction, a sensor, such as a rotary encoder, capable of detecting the rotation angle of the advance-and-retraction converter 14 is desirable for use as the position detector 47.

[0088] As described heretofore, the massager 1 embodying the present invention comprises the massaging mechanism 2 which is small and compact, yet performs effective massage on the treatment site ranging from the thigh backside B through the buttocks T of the user U, and can be securely stored within the support frame 3 without causing the massaging element 9, etc. to protrude beyond the upper end of the support frame 3.

Moreover, the massager 1 embodying the present invention includes the housing region S for housing the massaging mechanism 2 completely in the lower place, thereby increasing the comfort of the user U sitting on the massager 1.

[0089] Moreover, as shown in FIG. 7, etc., in this embodiment, the main body of the massaging mechanism 2 housing the drive motor 12 and the rotating shaft 13 is situated below the upper end of the first frame member 3a at all times. That is, in contrast to a mechanism such as shown in FIG. 15 of Japanese Unexamined Patent Publication JP-A 2013-248144 (Patent Literature 1), in this embodiment, the massaging mechanism 2 is designed so that the rotating shaft, etc. are not moved upward far beyond the upper end of the unit thereof. Moreover, the necessity of increasing the number of constituent components, such as a mechanism to raise the massaging mechanism, is eliminated.

[0090] 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 to be normally complied with by persons skilled in the art and that conform to matters of common knowledge among the skilled persons are adopted herein.

[0091] For example, the length of the arm member 24, 25 (the massaging body 10) provided in the massaging mechanism 2, the degree of eccentricity of the massaging body 10 with respect to the rotating shaft 13, and the spaced interval between the right-hand and left-hand massaging bodies 10 may be suitably changed as required in accordance with the range of massage treatment. Moreover, the boss member 27 may be inclined, and the angle of the inclination may be suitably changed as required.

In addition, the massager may be controlled in a manner such that, during the back-and-forth travel of the massaging mechanism 2 in the front-rear direction, the massaging element 9 performs pressure massage while maintaining its raised position (moves rectilinearly in a

direction from the thigh backside B (front) to the buttocks T (rear) of the user U while continuously pressing the treatment site without moving downward).

[0092] The massager 1 embodying the present invention may include a plurality of drive motors 12. Moreover, where the massaging element 9 is spherically shaped for example, for supporting the buttocks T, etc. while distributing the resulting load, the massaging element 9 may be attached to the tip of the massaging body 10 via urging means such as a spring. In addition, the massager 1 may include a width adjustment mechanism capable of varying the width of spacing between the paired right-hand and left-hand massaging bodies 10.

[0093] Moreover, the massager 1 embodying the present invention may be mounted into the seat of a stationary massage chair machine. The massager 1 embodying the present invention may also be mounted into a portable massager in seat form.

Reference Signs List

[0094]

- 1 Massager
- 2 Massaging mechanism
- 3 Support frame
- 3a First frame member (Main frame)
- 3b Second frame member (Sub frame)

4	Guide slot
5	Guide rail
6	First guide slot
7	Second guide slot
8	Base
9	Massaging element
10	Massaging body
11	Driver
12	Drive motor
12a	Output shaft
13	Rotating shaft
14	Advance-and-retraction converter
15	Moving mechanism
16	Speed reducing mechanism
17	Gear case
18	First worm gear
19	First worm wheel
20	Power transmission shaft
21	Second worm gear
22	Second worm wheel
23	Bearing
24	Front arm member
25	Rear arm member
26	Shaft portion
27	Boss member

27a	Cam surface
28	Annular fit portion
29	Traveling element (Pinion gear)
30	Rack gear
31	Speed changing mechanism
32	Gear case
33	First gear
34	Driven shaft
35	Second gear
36	Third gear
37	Fourth gear
38	Inclined portion (in Guide rail)
39	Inclined portion (in First guide slot)
40	Inclined portion (in Second guide slot)
41	Concave rail portion
42	Concave guide portion
43	Posture-retaining mechanism
44	First roller member (First slider member)
45	Second roller member (Second slider member)
46	Projecting piece
47	Position detector
S	Housing region
L	Height (Lowermost position)
H	Height (Uppermost position)
C	Chair

U	User
B	Thigh backside
T	Buttocks

CLAIMS

1. A massager, comprising:
 - a massaging mechanism to massage a treatment site of a user; and
 - a seat dimensioned to be wide enough for seating of the user, and including a support frame to house the massaging mechanism,
 - the massaging mechanism applying pressure massage to the treatment site from below upward, while traveling in a front-rear direction.
2. The massager according to claim 1, wherein the massaging mechanism comprises:
 - a massaging element to massage the treatment site;
 - a massaging body provided at its tip with the massaging element; and
 - a driver to permit advancing-and-retracting movement of the massaging element in a vertical direction.
3. The massager according to claim 2, wherein the driver comprises:
 - a drive motor to output a rotational driving force;

a rotating shaft which has a horizontally-directed axis, and rotates under the outputted rotational driving force; and
an advance-and-retraction converter to convert the rotational driving force from the rotating shaft into the advancing-and-retracting movement, and
the massaging element is caused to undergo the advancing-and-retracting movement in the vertical direction by vertical advancing-and-retracting action of the massaging body effected by the advance-and-retraction converter.

4. The massager according to claim 3, wherein
the driver includes a moving mechanism to move the massaging mechanism in the front-rear direction.

5. The massager according to claim 3, wherein
the advance-and-retraction converter comprises:
a boss member attached to the rotating shaft for eccentric rotation relative to an axis of the rotating shaft; and

an annular fit portion disposed at a base end of the massaging body, and fitted onto the boss member, and

the massaging body is caused to advance and retract in the vertical direction by the eccentric rotation of the

boss member.

6. The massager according to claim 5, wherein
the drive motor and the rotating shaft are provided
as a single drive motor and a single rotating shaft,
respectively, and

with rotatably driving operation of the single drive
motor on the single rotating shaft, the moving mechanism
moves the massaging mechanism in the front-rear direction,
and the massaging body including the massaging element is
caused to undergo the advancing-and-retracting movement in
the vertical direction.

7. The massager according to claim 6, wherein
the support frame is a flat, rectangularly shaped
frame body comprising:

first frame members, disposed one on each side of the
massaging mechanism in a right-left direction, for
supporting the massaging mechanism for travel in the front-
rear direction; and

second frame members, of which one is mounted so as
to span a region between front parts of, respectively, the
paired right-hand and left-hand first frame members, and
the other is mounted so as to span a region between rear
parts of, respectively, the paired right-hand and left-hand

first frame members, and

each of the first frame members is provided with a guide rail to guide the massaging mechanism in movement in the front-rear direction.

8. The massager according to claim 7, wherein the guide rail has one side downwardly inclined, and of an internal space defined by the first frame members, a lower space located toward the one side of the guide rail serves as a housing region to house the massaging mechanism.

9. The massager according to claim 8, wherein when the massaging mechanism in traveling motion is lowered into the housing region for storage, the massaging element is situated below an upper end of each of the first frame members, and

at the other side of the guide rail opposite the housing region, the massaging element is in a raised position in accordance with an eccentricity of the boss member.

10. The massager according to claim 9, wherein the massaging mechanism applies the pressure massage to the treatment site, ranging from buttocks through thigh

backside of the user, from below upward, while being guided in movement in the front-rear direction by the guide rail.

11. The massager according to any one of claims 8 to 10,
wherein

a main body of the massaging mechanism housing the drive motor and the rotating shaft is situated below the upper end of each of the first frame members.

12. The massager according to claim 11, wherein
the treatment site corresponds to buttocks or thigh of the user.