

SPECIFICATION

TITLE OF THE INVENTION: SOLE PRESSING MEMBER OF LOWER LIMB MASSAGE MACHINE

TECHNICAL FIELD

[0001]

The present disclosure relates to a sole pressing member of a lower limb massage machine, the sole pressing member being suitable for applying a pressing massage to the sole of a foot. The present application claims priority to Japanese Patent Application No. 2023-211017 filed on December 14, 2023, the entire disclosure of which is hereby incorporated by reference.

BACKGROUND ART

[0002]

Conventionally, there is a lower limb massage machine configured to perform massage operation on a treatment target site of a lower limb ranging from a foot (covering a toe and a heel) to a calf. For example, Patent Literature 1 discloses a lower limb massage machine for repeating massage operation of kneading a user's foot with the user's foot sandwiched between a pair of left and right massage units (kneading plates) and performing massage operation of pressing the sole of the user's foot from below with an acupoint pressing protrusion while rotating a sole pressing member of a roller body.

CITATION LIST

[PATENT LITERATURE]

[0003]

PATENT LITERATURE 1: Japanese Patent No. 6774868

SUMMARY OF THE INVENTION

[0004]

A sole pressing member of a lower limb massage machine according to an aspect of the present disclosure is a sole pressing member of a lower limb massage machine including a pair of left and right massage members configured to apply a kneading massage to a foot with the foot sandwiched between the pair of left and right massage members, and a rotary shaft having an axis extending in a left-right direction, the sole pressing member being disposed between the pair of left and right massage members and mounted to the rotary shaft so as to rotate together with the rotary shaft, the sole pressing member serving as a roller body disposed sidelong with an axis extending in the left-right direction, the sole pressing member as the roller body including at least a radially expanded portion having a shape widened toward a first end of the sole pressing member, wherein the radially expanded portion has an edge located adjacent to one of the pair of left and right massage members, wherein the radially expanded portion is provided with an acupoint pressing protrusion configured to apply a pressing massage to the sole, and wherein the acupoint pressing protrusion extends from the radially expanded portion toward a second end of the sole pressing member in a direction away from the one of the pair of left and right massage members in the left-right direction.

BRIEF DESCRIPTION OF DRAWINGS

[0005]

FIG. 1 is a perspective view schematically illustrating a lower limb massage machine including a sole pressing member of the present embodiment.

FIG. 2 is a front view schematically illustrating a left massage section and a right massage section each including the sole pressing member of the present embodiment.

FIG. 3 is a front view schematically illustrating the left massage section and the right massage section each including the sole pressing member of the present embodiment (in a state in which the sole pressing member is rotated by 90° from the position illustrated in FIG. 2).

FIG. 4 is a perspective view illustrating configurations of a massage member and the sole pressing member of the present embodiment.

FIG. 5 is an exploded view illustrating the massage member and the sole pressing member of the present embodiment.

DETAILED DESCRIPTION

[0006]

<Problems to be solved by the present disclosure>

Many of conventional acupoint pressing protrusions for applying a pressing massage to the sole of a foot are elongated and tapered (e.g., in the form of a rod). Using such an elongated acupoint pressing protrusion, some users may feel as if being stuck with a sharp object. In other words, some users may feel that a pressing massage applied to the sole of his/her foot is too strong. Consequently, there is a possibility that the pressing massage is not effective for such users.

[0007]

Conventional acupoint pressing protrusions may be inconvenient in such a respect that a treatment target site is caught in gaps between an acupoint pressing protrusion and a pair of left and right massage members respectively disposed outward of the acupoint pressing protrusion. In addition, the conventional acupoint pressing protrusions tend to have a problem in that a foot is shifted laterally on a rotating sole pressing member serving as a roller body. Since such circumstances may arise, users have demanded to stably support a foot and moderately press the sole of the foot.

[0008]

In view of the problems described above, hence, an object of the present disclosure is to provide a sole pressing member of a lower limb massage machine, the sole pressing member having a configuration that stably supports a foot, without a lateral shift of the foot, on an acupoint pressing protrusion of the sole pressing member disposed between a pair of left and right massage units and serving as a roller body and prevents such inconvenience that a treatment target site is caught in gaps between the sole pressing member and the pair of left and right massage units, thereby preventing the sole of the foot from being pressed excessively and applying an effective pressing massage to the sole.

[0009]

<Advantageous effect of the present disclosure>

A sole pressing member of a lower limb massage machine of the present disclosure has a configuration that stably supports a foot, without a lateral shift of the foot, on an acupoint pressing protrusion of the sole pressing member disposed between a pair of left and right massage units and serving as a roller body and prevents such inconvenience that a treatment target site is caught in gaps between the sole pressing member and the pair of left and right massage units, thereby preventing the sole of the foot from being pressed excessively and applying an effective pressing massage to the sole.

[0010]

<Outline of embodiments of the present disclosure>

An outline of below-listed embodiments of the present disclosure is described.

[0011]

In order to achieve the foregoing object, the present disclosure takes the following technical measures.

[0012]

(1) A sole pressing member of a lower limb massage machine according to the present disclosure is a sole pressing member of a lower limb massage machine including a pair of left and right massage members configured to apply a kneading massage to a foot with the foot sandwiched between the pair of left and right massage members, and a rotary shaft having an axis extending in a left-right direction, the sole pressing member being disposed between the pair of left and right massage members and mounted to the rotary shaft so as to rotate together with the rotary shaft, the sole pressing member serving as a roller body disposed sidelong with an axis extending in the left-right direction, the sole pressing member as the roller body including at least a radially expanded portion having a shape widened toward a first end of the sole pressing member, wherein the radially expanded portion has an edge located adjacent to one of the pair of left and right massage members, wherein the radially expanded portion is provided with an acupoint pressing protrusion configured to apply a pressing massage to the sole, and wherein the acupoint pressing protrusion extends from the radially expanded portion toward a second end of the sole pressing member in a direction away from the one of the pair of left and right massage members in the left-right direction.

[0013]

(2) In (1) described above, the sole pressing member may include a pair of the radially expanded portions including a first radially expanded portion having a shape widened toward the first end and a second radially expanded portion having a shape widened toward the second end.

[0014]

(3) In (2) described above, the sole pressing member may include a lateral midway portion disposed between the first radially expanded portion and the second radially expanded portion, and have a hourglass shape formed of the first radially expanded portion and the second radially expanded portion provided in a pair as well as the lateral midway portion narrower than the first radially expanded portion and the second radially expanded portion.

[0015]

(4) In (3) described above, the first radially expanded portion may have an edge located adjacent to one of the pair of left and right massage members, and the second radially expanded portion may have an edge located adjacent to the other of the pair of left and right massage members.

[0016]

(5) In (1) described above, a height of the acupoint pressing protrusion may be equal to or lower than a radius of the radially expanded portion at a position of the edge which is a radially widest part of the radially expanded portion.

[0017]

(6) In (5) described above, the acupoint pressing protrusion may include a horizontal portion extending in the left-right direction, a perpendicular portion extending in a direction perpendicular to the left-right direction, and a corner portion connecting the horizontal portion and the perpendicular portion.

[0018]

(7) In (2) described above, the first radially expanded portion may be provided with a first acupoint pressing protrusion, the first acupoint pressing protrusion may serve as the acupoint pressing protrusion extending in the left-right direction, the second radially expanded portion may be provided with a second acupoint pressing protrusion, and the first acupoint pressing protrusion and the second acupoint pressing protrusion may face each other in the left-right direction.

[0019]

(8) In (7) described above, a height of the first acupoint pressing protrusion may be higher than or equal to a height of the second acupoint pressing protrusion.

[0020]

(9) In (7) described above, the first radially expanded portion may be provided with a plurality of the first acupoint pressing protrusions arranged in a circumferential direction of the first radially expanded portion and/or the second radially expanded portion may be provided with a plurality of the second acupoint pressing protrusions arranged in a circumferential direction of the second radially expanded portion.

[0021]

(10) In (1) described above, at least one of the pair of left and right massage members may have a base end that is inclined with respect to the rotary shaft and has a through hole, and the edge of the radially expanded portion of the roller body may be inclined so as to be adjacent to a sidewall of the at least one of the pair of left and right massage members.

[0022]

<Details of embodiments of the present disclosure>

Details of embodiments of the present disclosure are described below with reference to the drawings. It should be noted that at least some of the embodiments described below may be arbitrarily combined with each other.

[0023]

It should be noted that the embodiments described below are examples embodying the present disclosure; therefore, the configuration of the present disclosure is not limited to these specific examples. In the drawings, some components are not illustrated or are indicated by, for example, imaginary lines in consideration of viewability.

[0024]

For example, FIGs. 1 to 5 illustrate directions, such as a front-rear direction and a left-right direction, of a lower limb massage machine 1. These directions correspond with directions seen from a user sitting in a chair or the like with his/her lower limbs inserted in the lower limb massage machine 1. In the following description, the directions defined in, for

example, FIGs. 1 to 5 are used in describing the lower limb massage machine 1 of the present disclosure.

[0025]

In the present embodiment, the term “foot F” refers to an area located lower than an ankle and covering a heel, a sole U (an arch A), and a toe. Also in the present embodiment, the term “calf” refers to an area ranging from an ankle to a knee in a human lower limb.

[0026]

As illustrated in, for example, FIGs. 1 to 5, the lower limb massage machine 1 of the present embodiment includes a massage mechanism 2 for massaging both the user’s left and right lower limbs (treatment target sites). The massage mechanism 2 is configured to simultaneously perform a massage that kneads the feet F each constituting a part of the corresponding lower limb with the feet F sandwiched by the massage mechanism 2 and a pressing massage that presses the soles U (arches A) like acupressure.

[0027]

The lower limb massage machine 1 of the present embodiment also includes an upper massage mechanism (not illustrated) configured to perform a massage that kneads the calves each constituting a part of the corresponding lower limb with the calves sandwiched by the upper massage mechanism.

[0028]

More specifically, the lower limb massage machine 1 of the present embodiment includes the massage mechanism 2 (lower massage mechanism) configured to perform massage operation on both the left and right feet F, both the left and right soles U (arches A), and the like of the user, and a case body 3 accommodating the massage mechanism 2.

[0029]

As illustrated in FIGs. 1 to 4, the case body 3 is a housing having a square shape or a

horizontally or vertically oriented rectangular shape in front view and having a boot shape in side view. The case body 3 includes a bottom plate member 3a where the massage mechanism 2 is placed, and an upper cover body 3b located higher than the bottom plate member 3a.

[0030]

The upper cover body 3b (case body 3) is provided with a pair of left and right treatment recess portions 4L and 4R. The upper cover body 3b of the present embodiment is provided with the treatment recess portions 4L and 4R that are open upward and forward and are laterally spaced apart from each other. In the present embodiment, the user moves his/her left and right feet FL and FR from the front to the rear, thereby fitting his/her left and right feet FL and FR into the left and right treatment recess portions 4L and 4R. A liner (not illustrated) is provided inside the treatment recess portions 4L and 4R.

[0031]

As illustrated in FIGs. 1 to 3, the massage mechanism 2 is disposed below the left and right treatment recess portions 4L and 4R and is configured to apply a kneading massage to the left and right feet FL and FR from the sides and apply a pressing massage to the soles UL and UR (arches AL and AR). In the present embodiment, the upper massage mechanism is disposed above the left and right treatment recess portions 4L and 4R and is configured to massage the left and right calves from the sides.

[0032]

As illustrated in FIG. 1, the bottom plate member 3a (the bottom surface of the case body 3) is provided with a plurality of support members 5a and 5b directed upward. The support members 5a and 5b support the massage mechanism 2 from below. The support members 5a are respectively disposed on the left and right ends of the bottom surface of the case body 3 and support the ends of a rotary shaft 7 of the massage mechanism 2 such that the rotary shaft 7 is rotatable.

[0033]

The one support member 5b is disposed between the pair of left and right support members 5a and supports a longitudinal midway portion of the rotary shaft 7 such that the rotary shaft 7 is rotatable. A gear case of a driver 8 is mounted to the upper side of the support member 5b. That is, the two support members 5a and 5a and the support member 5b are arranged in the left-right direction at substantially equal intervals on the bottom plate member 3a (the bottom surface of the case body 3).

[0034]

As illustrated in, for example, FIGs. 1 to 5, the lower limb massage machine 1 of the present embodiment includes the massage mechanism 2 configured to massage the left and right feet F, the left and right soles U, and the like.

[0035]

The massage mechanism 2 of the present embodiment includes a left massage section 6L configured to massage the left foot FL, the left sole UL, and the like, a right massage section 6R configured to massage the right foot FR, the right sole UR, and the like, the rotary shaft 7 provided so as to pass through a through hole in a base end of each of the left massage section 6L and the right massage section 6R, and the driver 8 configured to rotationally drive the rotary shaft.

[0036]

The driver 8 rotationally drives the rotary shaft 7 to operate the left massage section 6L and the right massage section 6R. The driver 8 includes a drive motor configured to generate a rotational driving force, and the gear case configured to reduce the rotational driving force to a predetermined speed. The gear case is supported by the support member 5b.

[0037]

The rotary shaft 7 is provided in the bottom plate member 3a (the bottom surface of the

case body 3) with the axis extending horizontally in the left-right direction. The rotary shaft 7 is supported by the three support members 5a and 5b so as to be rotatable by bearings.

[0038]

The rotary shaft 7 has the axis extending in the left-right direction and passes through through holes in base ends of a pair of left and right massage members 9L and 10L (i.e., the left massage section 6L) and through holes in base ends of a pair of left and right massage members 9R and 10R (i.e., the right massage section 6R) in the left-right direction.

[0039]

The rotary shaft 7 transmits power for a kneading massage to the pair of left massage members 9L and 10L (i.e., the left massage section 6L) and the pair of right massage members 9R and 10R (i.e., the right massage section 6R). To the rotary shaft 7, a pair of sole pressing members 11L and 11R (described in detail below) are rotatably mounted.

[0040]

The present disclosure relates to the sole pressing member 11 of the lower limb massage machine 1 including the pair of left and right massage members 9 and 10 configured to apply a kneading massage to the foot F with the foot F sandwiched between the pair of left and right massage members 9 and 10, and the rotary shaft 7 having the axis extending in the left-right direction, the rotary shaft 7 passing through the through holes in the base ends of the pair of left and right massage members 9 and 10, the sole pressing member 11 being disposed between the pair of massage members 9 and 10 and mounted to the rotary shaft 7 so as to rotate together with the rotary shaft 7.

[0041]

The sole pressing member 11 of the present disclosure serves as a roller body (a columnar body) disposed sidelong with an axis extending in the left-right direction. The sole pressing member 11 as the roller body includes at least a radially expanded portion 26 having a

shape widened toward a first end of the sole pressing member 11, i.e., toward the big toe of the foot F.

[0042]

The radially expanded portion 26 has an edge 24 located adjacent to a sidewall of the massage member 9. The radially expanded portion 26 is provided with an acupoint pressing protrusion 28 configured to apply a pressing massage to the sole U.

[0043]

The acupoint pressing protrusion 28 extends from the radially expanded portion 26 toward a second end 25 of the sole pressing member 11 in the direction away from the massage member 9 in the left-right direction.

[0044]

[Left Massage Section]

With regard to a characteristic configuration of the sole pressing member 11 of the lower limb massage machine 1 of the present disclosure, a description is given focusing on the left massage section 6L.

[0045]

As illustrated in, for example, FIG. 2, the left massage section 6L includes the pair of left and right massage members 9L and 10L configured to apply a kneading massage to the left foot FL constituting a part of the left lower limb with the left foot FL sandwiched between the pair of left and right massage members 9L and 10L, and the sole pressing member 11L disposed between the pair of left and right massage members 9L and 10L and mounted to the rotary shaft 7 so as to rotate together with the rotary shaft 7.

[0046]

The left massage members 9L and 10L of the present embodiment are plate-shaped kneading massage members 9L and 10L. The left massage members 9L and 10L are curved so

as to fit the shape of the left foot FL including the toe, the instep, the ankle, the heel, and the like. The left massage members 9L and 10L are disposed facing each other so as to surround the left foot FL.

[0047]

The left inner massage member 9L is located so as to come into contact with the inside (covering the big toe and the arch AL) of the left foot FL. The left inner massage member 9L is a plate-shaped member disposed above the rotary shaft 7 and protruding forward and rearward. The left inner massage member 9L is inclined so that the front (the leading end) is lower in height than the rear.

[0048]

The left inner massage member 9L includes a left inner kneading plate 12L disposed as a base and located so as to come into contact with the inside (covering the big toe and the arch AL) of the left foot FL, and a cushioning medium 13L mounted to the left inner kneading plate 12L so as to overlap the inside of the left inner kneading plate 12L (the side of the left inner kneading plate 12L to be brought into contact with the inside of the left foot FL).

[0049]

The left inner kneading plate 12L has a shape fitting the shape of the left foot FL. The cushioning medium 13L is deformable along the shape of the left foot FL including the side of the big toe and the arch AL, so that the user can be massaged comfortably.

[0050]

The left outer massage member 10L is located so as to come into contact with the outside (covering the little toe) of the left foot FL. The left outer massage member 10L is a plate-shaped member disposed above the rotary shaft 7 and protruding forward and rearward. The left outer massage member 10L is inclined so that the front (the leading end) is lower in height than the rear.

[0051]

The left outer massage member 10L includes a left outer kneading plate 14L disposed as a base and located so as to come into contact with the outside (covering the little toe) of the left foot FL, and a cushioning medium 15L mounted to the left outer kneading plate 14L so as to overlap the inside of the left outer kneading plate 14L (the side of the left outer kneading plate 14L to be brought into contact with the outside of the left foot FL).

[0052]

The left outer kneading plate 14L has a shape fitting the shape of the left foot FL. The cushioning medium 15L is deformable along the shape of the left foot FL (the left outer side), so that the user can be massaged comfortably.

[0053]

The pair of left massage members 9L and 10L (left kneading plates 9L and 10L) perform kneading massage operation on the left foot FL ranging from the toe to the heel, by pressing the inside and outside of the left foot FL with the left foot FL sandwiched between the pair of left massage members 9L and 10L.

[0054]

As illustrated in, for example, FIGs. 1 to 3, the left inner massage member 9L includes a longitudinal midway portion serving as a base end provided with a left inner conversion portion 16L. The left inner conversion portion 16L converts a rotational driving force of the rotary shaft 7 into swing motion of the left inner massage member 9L.

[0055]

The left inner conversion portion 16L includes a left inner rotary boss portion 18L configured to rotate integrally with the rotary shaft 7, a left inner annular fitting portion 19L disposed on the base end of the left inner massage member 9L and fitted to an outer peripheral edge of the left inner rotary boss portion 18L, and a left inner restriction portion 20L configured

to restrict, to the left inner massage member 9L, the accompanied rotation by the rotary shaft 7.

[0056]

The left inner rotary boss portion 18L has, on its outer peripheral surface, a cam surface inclined with respect to the rotary shaft 7. The left inner annular fitting portion 19L is externally fitted to the left inner rotary boss portion 18L so as to be rotatable relative to the cam surface of the left inner rotary boss portion 18L. When the left inner annular fitting portion 19L slides on the cam surface inclined by the rotation of the left inner rotary boss portion 18L, the left inner massage member 9L swings about the axis of the rotary shaft 7.

[0057]

The left inner restriction portion 20L restricts, to the left inner annular fitting portion 19L, the rotation together with the left inner rotary boss portion 18L. The left inner restriction portion 20L includes a pin member disposed on the base end of the left inner massage member 9L, and a restriction groove in which the pin member is slidably fitted. The restriction groove (not illustrated) is formed in the bottom plate member 3a at a position facing the pin member.

[0058]

The left outer massage member 10L includes a longitudinal (front-rear) midway portion having a lower end serving as a base end provided with a left outer conversion portion 17L. The left outer conversion portion 17L converts the rotational driving force of the rotary shaft 7 into swing motion of the left outer massage member 10L.

[0059]

The left outer conversion portion 17L is located facing the left inner conversion portion 16L. In other words, the left inner and outer conversion portions 16L and 17L are arranged side by side in the left-right direction.

[0060]

The left outer conversion portion 17L includes a left outer rotary boss portion 21L

configured to rotate integrally with the rotary shaft 7, a left outer annular fitting portion 22L disposed on the base end of the left outer massage member 10L and fitted to an outer peripheral edge of the left outer rotary boss portion 21L, and a left outer restriction portion 23L configured to restrict, to the left outer massage member 10L, the accompanied rotation by the rotary shaft 7.

[0061]

The left inner and outer conversion portions 16L and 17L are inclined such that the inclinations of the left inner and outer rotary boss portions 18L and 21L are opposite in directions (i.e., the left inner and outer conversion portions 16L and 17L form a “V” shape or an inverted “V” shape in front view by the rotation). This arrangement causes the left inner and outer conversion portions 16L and 17L to convert the rotational driving force of the rotary shaft 7 into motion of the left inner and outer massage members 9L and 10L, so that the left inner and outer massage members 9L and 10L are brought close to or separated from each other.

[0062]

Specifically, the left inner and outer conversion portions 16L and 17L convert the rotational driving force of the rotary shaft 7 into the swing motion of the left inner and outer massage members 9L and 10L by the inclined rotation of the left inner and outer rotary boss portions 18L and 21L. The left inner and outer massage members 9L and 10L are tilted in such a manner that their front ends are brought close to each other. Thereafter, the left inner and outer massage members 9L and 10L are tilted in such a manner that their front ends are separated from each other while their longitudinal midway portions are brought close to each other. Finally, the left inner and outer massage members 9L and 10L are tilted in such a manner that their longitudinal midway portions are separated from each other while their rear ends are brought close to each other.

[0063]

As described above, the left inner and outer conversion portions 16L and 17L convert

the rotational driving force of the rotary shaft 7 into the swing motion, so that the left inner and outer massage members 9L and 10L are tilted while their front ends, longitudinal midway portions, and rear ends are brought close to each other in sequence, to thereby apply a kneading massage to the left foot FL so as to press the left foot FL with the left foot FL sandwiched between the left inner and outer massage members 9L and 10L.

[0064]

As illustrated in FIGs. 1 to 5, the left massage section 6L of the present embodiment includes the sole pressing member 11L configured to perform pressing massage operation on the longitudinal center (the arch AL) of the sole UL of the left foot FL so as to press the arch AL from below like acupressure.

[0065]

The sole pressing member 11L of the present embodiment serves as a roller body (a rotatable body, a columnar body) disposed sidelong with an axis extending in the left-right direction. The sole massage roller 11L (the sole pressing member 11L) of the present embodiment is disposed between the left inner and outer massage members 9L and 10L. The left sole massage roller 11L is mounted to the left of the rotary shaft 7 so as to be paired with a right sole massage roller 11R.

[0066]

The sole massage roller 11L is mounted to the rotary shaft 7 with the rotary shaft 7 rotatably passing through a through hole in the sole massage roller 11L. In the present embodiment, the axis of the sole massage roller 11L is concentric with the axis of the rotary shaft 7. Alternatively, the axis of the sole massage roller 11L may be eccentric with the axis of the rotary shaft 7.

[0067]

The sole massage roller 11L of the present embodiment has a width capable of

supporting the arch AL of the sole UL of the left foot FL in surface contact with the arch AL. The sole massager roller 11L rotates in conjunction with the repeated swing motion of the left inner and outer massager members 9L and 10L to apply a pressing massager to the arch AL (the sole UL).

[0068]

As illustrated in FIGs. 2 to 5, the sole massager roller 11L (the sole pressing member 11L) of the present embodiment serves as a rotatable body having a lateral width almost equal to the width of the left foot FL.

[0069]

The sole massager roller 11L includes a radially expanded portion 26L having a shape widened from a lateral (longitudinal) midway portion of the sole massager roller 11L toward a first end of the sole massager roller 11L. The first end refers to an area ranging from a position where the first radially expanded portion 26L starts to widen to an edge 24L of the first radially expanded portion 26L (a right edge 24L (an inner edge 24L) of the sole massager roller 11L).

[0070]

Specifically, the first radially expanded portion 26L of the present embodiment has a shape gradually widened from the longitudinal midway portion of the sole massager roller 11L toward the edge 24L that is on the nearer side to the arch AL of the left foot FL (i.e., the inside). In other words, the first radially expanded portion 26L of the present embodiment is in the form of a bell the bottom of which is directed rightward. The first radially expanded portion 26L has a shape gradually and radially expanded toward the left inner massager member 9L.

[0071]

The sole massager roller 11L of the present embodiment includes the first radially expanded portion 26L having the shape widened inward, i.e., toward the first end of the sole massager roller 11L, and a second radially expanded portion 27L having a shape widened

outward, i.e., toward a second end of the sole massage roller 11L.

[0072]

The second end refers to an area ranging from a position where the second radially expanded portion 27L starts to widen to an edge 25L of the second radially expanded portion 27L (a left edge 25L (an outer edge 25L) of the sole massage roller 11L).

[0073]

The second radially expanded portion 27L of the present embodiment has a shape gradually widened from the longitudinal midway portion of the sole massage roller 11L toward the edge 25L that is on the nearer side to the outside (covering the little toe) of the left foot FL (i.e., the outside). In other words, the second radially expanded portion 27L of the present embodiment is in the form of a bell the bottom of which is directed leftward. The second radially expanded portion 27L has a shape gradually and radially expanded toward the left outer massage member 10L.

[0074]

In the sole massage roller 11L of the present embodiment, the first radially expanded portion 26L having the shape widened from the longitudinal midway portion toward the right edge 24L and the second radially expanded portion 27L having the shape widened from the longitudinal midway portion toward the left edge 25L are provided in a pair.

[0075]

In other words, the sole massage roller 11L of the present embodiment has a hourglass shape formed of the first and second radially expanded portions 26L and 27L provided in a pair as well as the lateral midway portion narrower than the first and second radially expanded portions 26L and 27L.

[0076]

As described above, since the sole massage roller 11L includes the pair of radially

expanded portions 26L and 27L respectively widened toward the left and right edges 24L and 25L (i.e., the sole massage roller 11L has the hourglass shape), the left foot FL is positioned at the lateral center of the sole massage roller 11L without lateral shift, so that the user can be massaged reliably.

[0077]

The edge 24L of the left inner first radially expanded portion 26L (the right edge 24L of the sole massage roller 11L) is disposed adjacent to a sidewall (the left inner annular fitting portion 19L) of the left inner massage member 9L of the pair of massage members 9L and 10L.

[0078]

The term “adjacent” as used herein involves that the edge 24L of the first radially expanded portion 26L is slidably in contact with the left inner massage member 9L or a gap of several millimeters (approximately 0.1 mm to 3 mm) is defined between the edge 24L of the first radially expanded portion 26L and the left inner massage member 9L.

[0079]

In the present embodiment, the edge 25L of the left outer second radially expanded portion 27L (the left edge 25L (the outer edge 25L) of the sole massage roller 11L) is disposed adjacent to a sidewall (the left outer annular fitting portion 22L) of the left outer massage member 10L.

[0080]

The term “adjacent” as used herein involves that the edge 25L of the second radially expanded portion 27L is slidably in contact with the left outer massage member 10L or a gap of several millimeters (approximately 0.1 mm to 3 mm) is defined between the edge 25L of the second radially expanded portion 27L and the left outer massage member 10L.

[0081]

As illustrated in FIG. 3, in the present embodiment, the edge 24L (the radially widest

part) of the first radially expanded portion 26L is flush with a first acupoint pressing protrusion 28L. Preferably, the edge 24L (the radius) of the first radially expanded portion 26L is equal to (is flush with) the height of the first acupoint pressing protrusion 28L or is larger than the first acupoint pressing protrusion 28L.

[0082]

The sole massage roller 11L of the present embodiment has, on its outer peripheral surface, acupoint pressing protrusions 28L, 29L, and 30L directed radially outward and spaced apart from each other in the axial direction of the rotary shaft 7 and the circumferential direction. The sole massage roller 11L of the present embodiment has a plurality of acupoint pressing protrusions 28L, 29L, and 30L different in shape from each other.

[0083]

As illustrated in FIGs. 2 to 5, the first radially expanded portion 26L is provided with the first acupoint pressing protrusions 28L configured to apply a pressing massage to the sole UL (the arch AL) of the left foot FL.

[0084]

The first acupoint pressing protrusions 28L extend from the first radially expanded portion 26L outward, i.e., toward the second end of the sole massage roller 11L in the direction away from the left inner massage member 9L in the left-right direction.

[0085]

As illustrated in FIG. 2, the first acupoint pressing protrusions 28L extend from the edge 24L of the first radially expanded portion 26L leftward (i.e., in the direction away from the left inner massage member 9L) along the axial direction of the rotary shaft 7.

[0086]

The first acupoint pressing protrusions 28L each have a predetermined thickness and are disposed at positions corresponding to the arch AL of the left foot FL (the inside of the sole UL

of the left foot FL). The first acupoint pressing protrusions 28L have corners rounded so as not to bite into the sole UL and the arch AL.

[0087]

Preferably, the heights of the first acupoint pressing protrusions 28L are equal to (are flush with) or lower than the radius of the first radially expanded portion 26L at the position of the edge 24L which is the radially widest part of the first radially expanded portion 26L (the right edge 24L of the sole massage roller 11L). In other words, preferably, the first acupoint pressing protrusions 28L each have a size not protruding beyond the edge 24L (the radially widest part) of the first radially expanded portion 26L.

[0088]

As illustrated in FIG. 3, in the present embodiment, the first acupoint pressing protrusions 28L are flush with the edge 24L (the radially widest part) of the first radially expanded portion 26L. The first acupoint pressing protrusions 28L overhang leftward from the edge 24L of the first radially expanded portion 26L (the right edge 24L of the sole massage roller 11L).

[0089]

As described above, the edge 24L of the first radially expanded portion 26L of the left sole massage roller 11L is disposed adjacent to the sidewall of the left inner massage member 9L, and the heights of the first acupoint pressing protrusions 28L are set equal to or lower than the radius of the first radially expanded portion 26L at the position of the edge 24L which is the radially widest part of the first radially expanded portion 26L. This configuration substantially eliminates a gap between the left inner massage member 9L and each first acupoint pressing protrusion 28L.

[0090]

It is therefore possible to prevent the inside (covering the arch AL) of the left foot FL

from being caught in the gap between the left inner massage member 9L and each first acupoint pressing protrusion 28L during massage operation.

[0091]

The first acupoint pressing protrusions 28L of the present embodiment each include a horizontal portion 31L extending leftward from the edge 24L of the first radially expanded portion 26L along the axial direction of the rotary shaft 7, and serving as a side of the first acupoint pressing protrusion 28L extending in the axial direction of the rotary shaft 7, a perpendicular portion 32L serving as a side of the first acupoint pressing protrusion 28L extending in the direction perpendicular to the axial direction of the rotary shaft 7 (a rising portion extending in the direction crossing the left-right direction), and a corner portion 33L connecting the horizontal portion 31L and the perpendicular portion 32L. The perpendicular portion 32L may be a side extending in the direction perpendicular to the axial direction of the rotary shaft 7 or may be a side extending in the direction crossing the axial direction of the rotary shaft 7. For example, the perpendicular portion 32L may be a side, such as a rising portion 32L, inclined in a trapezoidal shape).

[0092]

The first acupoint pressing protrusions 28L each have an approximately triangular flat surface 34L defined by the horizontal portion 31L, the perpendicular portion 32L, the corner portion 33L, and an oblique side of the first radially expanded portion 26L. In addition, the first acupoint pressing protrusions 28L are protrusions protruding wide and leftward along the axial direction of the rotary shaft 7.

[0093]

As illustrated in FIG. 3, the first acupoint pressing protrusions 28L of the present embodiment are protrusions each protruding large and leftward from the edge 24L of the first radially expanded portion 26L and having a large and horizontally oriented shape to an extent

that each first acupoint pressing protrusion 28L has the flat surface 34L. The first acupoint pressing protrusions 28L are provided in a pair with the rotary shaft 7 interposed therebetween.

[0094]

Referring back to FIG. 2, the horizontal portion 31L extends long and leftward from the edge 24L of the first radially expanded portion 26L along the axial direction of the rotary shaft 7.

[0095]

As illustrated in FIG. 3, the horizontal portion 31L is located at the same height as the edge 24L which is the radially widest part of the first radially expanded portion 26L. In other words, the horizontal portion 31L serves as a long side extending straight and leftward from the edge 24L of the first radially expanded portion 26L (the right edge 24L of the sole massage roller 11L) along the axial direction of the rotary shaft 7.

[0096]

As described above, since the horizontal portion 31L serves as the side extending long and leftward from the edge 24L of the first radially expanded portion 26L (the right edge 24L of the sole massage roller 11L), the horizontal portion 31L is capable of supporting the sole UL (the arch AL) of the left foot FL in line contact or surface contact with the sole UL (the arch AL).

[0097]

The perpendicular portion 32L (the rising portion 32L) serves as a side extending perpendicularly from an end of the horizontal portion 31L. The corner portion 33L is located at a distal end of the horizontal portion 31L. The perpendicular portion 32L hangs down from the corner portion 33L in the axial direction of the rotary shaft 7. The corner portion 33L has a shape capable of strongly pressing the arch AL (the sole UL). On the other hand, the corner portion 33L is rounded so as not to excessively bite into the arch AL (the sole UL).

[0098]

The horizontal portion 31L and the corner portion 33L may be located lower than a

lateral extension of the edge 24L of the first radially expanded portion 26L.

[0099]

As described above, since the first acupoint pressing protrusions 28L each include the horizontal portion 31L, the perpendicular portion 32L, and the corner portion 33L (i.e., has the horizontally oriented shape as illustrated in FIG. 3), the first acupoint pressing protrusions 28L are capable of stably supporting the left foot FL at the horizontal portions 31L and preventing the left foot FL from sinking. In addition, since the first acupoint pressing protrusions 28L each include the corner portion 33L, the first acupoint pressing protrusions 28L are capable of effectively applying a pressing massage like strong acupressure to the arch AL (the sole UL).

[0100]

Since the first acupoint pressing protrusions 28L of the present embodiment have the horizontally oriented shape and are axially provided in a pair at equal intervals, the first acupoint pressing protrusions 28L are capable of applying a pressing massage like strong acupressure to the arch AL of the left foot FL with a predetermined rhythm (at 180° intervals) while stably supporting the left foot FL.

[0101]

If an elongated and tapered acupoint pressing protrusion, i.e., a rod-shaped acupoint pressing protrusion is used, an excessively strong pressing massage is applied to a sole in some cases. According to the present embodiment, on the other hand, the first radially expanded portion 26L and the horizontally oriented first acupoint pressing protrusions 28L provided on the first radially expanded portion 26L are capable of effectively applying a pressing massage to the sole UL (the arch AL).

[0102]

According to the present embodiment, the first acupoint pressing protrusions 28L are not sharp. Therefore, even if the fabric cover (the liner) of the treatment recess portion 4L is

frayed, there is no possibility that the frayed yarn is entangled with and caught on the first acupoint pressing protrusions 28L, avoiding the breakage or deterioration of the fabric cover.

[0103]

The second radially expanded portion 27L is provided with the second acupoint pressing protrusions 29L. The second acupoint pressing protrusions 29L are disposed at positions corresponding to the outside (covering the little toe) of the sole UL of the left foot FL. The second acupoint pressing protrusions 29L are disposed facing the first acupoint pressing protrusions 28L in the axial direction of the rotary shaft 7.

[0104]

The second acupoint pressing protrusions 29L protrude small and radially outward and are provided in a pair with the rotary shaft 7 interposed therebetween. The second acupoint pressing protrusions 29L are capable of applying a pressing massage like soft acupressure to the outside of the foot with a predetermined rhythm (at 180°-phase intervals).

[0105]

With regard to the sizes of the acupoint pressing protrusions 28L and 29L of the present embodiment, the first acupoint pressing protrusions 28L for pressing the inside (covering the arch AL) of the left foot FL are large. On the other hand, the second acupoint pressing protrusions 29L for pressing the outside (covering the little toe) of the left foot FL are smaller than the first acupoint pressing protrusions 28L.

[0106]

Alternatively, the second acupoint pressing protrusions 29L may be equal in shape to the first acupoint pressing protrusions 28L and may be provided on the second radially expanded portion 27L so as to face the first acupoint pressing protrusions 28L. In other words, the first acupoint pressing protrusions 28L may be provided on the left and right radially expanded portions 26L and 27L so as to face each other in the axial direction of the rotary shaft 7.

[0107]

Since the acupoint pressing protrusions 28L and 29L face each other, the acupoint pressing protrusions 28L and 29L are capable of applying a pressing massage like acupressure to the inside (covering the arch AL and big toe) of the left foot FL and the outside (covering the little toe) of the left foot FL at the same timing (180°-phase intervals). In addition, the left foot FL can be brought close to the center of the sole massage roller 11L.

[0108]

The third acupoint pressing protrusions 30L are provided at the center of the sole massage roller 11L corresponding to the sole UL of the left foot FL. The third acupoint pressing protrusions 30L protrude large and radially outward and are provided in a pair with the rotary shaft 7 interposed therebetween. The size, shape, arrangement, and the like of the third acupoint pressing protrusions 30L are optionally settable. The third acupoint pressing protrusions 30L are capable of applying a pressing massage like strong acupressure to the sole UL (e.g., the center of the arch) with a predetermined rhythm (at 180° intervals).

[0109]

The sole massage roller 11L including the plurality of acupoint pressing protrusions 28L, 29L, and 30L different in shape from each other rotates and thereby applies an effective pressing massage to the sole UL and arch AL of the left foot FL.

[0110]

As described above, the sole massage roller 11L of the lower limb massage machine 1 of the present disclosure serves as the hourglass-shaped roller body including the first radially expanded portion 26L having the shape widened toward the edge 24L of the first end and the second radially expanded portion 27L paired with the first radially expanded portion 26L, and the first radially expanded portion 26L is provided with the horizontally oriented acupoint pressing protrusions 28L each including the horizontal portion 31L, the perpendicular portion

32L, and the corner portion 33L. It is therefore possible to stably support the left foot FL without lateral shift of the left foot FL. It is also possible to apply an effective pressing massage to the sole UL (the arch AL) by moderately pressing the sole UL (the arch AL) while preventing the sole UL (arch AL) from being pressed excessively.

[0111]

[Right Massage Section]

Next, the right massage section 6R is described. The right massage section 6R is equal in configuration to the left massage section 6L; therefore, only the gist thereof is described.

[0112]

The right massage section 6R includes the pair of left and right massage members 9R and 10R configured to apply a kneading massage to the right foot FR constituting a part of the right lower limb with the right foot FR sandwiched between the pair of left and right massage members 9R and 10R, and the sole pressing member 11R disposed between the pair of left and right massage members 9R and 10R and mounted to the rotary shaft 7 so as to rotate together with the rotary shaft 7.

[0113]

The right massage members 9R and 10R of the present embodiment are plate-shaped kneading massage members 9R and 10R. The right massage members 9R and 10R are curved so as to fit the shape of the right foot FR including the toe, the instep, the ankle, the heel, and the like. The right massage members 9R and 10R are disposed facing each other so as to surround the right foot FR.

[0114]

The right inner massage member 9R includes a right inner kneading plate 12R disposed as a base and located so as to come into contact with the inside (covering the big toe and the arch AR) of the right foot FR, and a cushioning medium 13R mounted to the right inner kneading

plate 12R so as to overlap the inside of the right inner kneading plate 12R (the side of the right inner kneading plate 12R to be brought into contact with the inside of the right foot FR).

[0115]

The right outer massage member 10R includes a left outer kneading plate 14R disposed as a base and located so as to come into contact with the outside (covering the little toe) of the right foot FR, and a cushioning medium 15R mounted to the right outer kneading plate 14R so as to overlap the inside of the right outer kneading plate 14R (the side of the right outer kneading plate 14R to be brought into contact with the outside of the right foot FR).

[0116]

The pair of right massage members 9R and 10R (right kneading plates 9R and 10R) perform kneading massage operation on the right foot FR ranging from the toe to the heel, by pressing the inside and outside of the right foot FR with the right foot FR sandwiched between the pair of right massage members 9R and 10R.

[0117]

As illustrated in, for example, FIGs. 1 to 3, the right inner massage member 9R includes a longitudinal midway portion serving as a base end provided with a right inner conversion portion 16R. The right inner conversion portion 16R converts the rotational driving force of the rotary shaft 7 into swing motion of the right inner massage member 9R.

[0118]

The right outer massage member 10R includes a longitudinal midway portion serving as a base end provided with a right outer conversion portion 17R. The right outer conversion portion 17R converts the rotational driving force of the rotary shaft 7 into swing motion of the right outer massage member 10R.

[0119]

The right outer conversion portion 17R is located facing the right inner conversion

portion 16R. In other words, the right inner and outer conversion portions 16R and 17R are arranged side by side in the left-right direction. The right inner and outer conversion portions 16R and 17R are inclined in opposite directions (i.e., the right inner and outer conversion portions 16R and 17R form a “V” shape or an inverted “V” shape by the rotation). This arrangement causes the right inner and outer conversion portions 16R and 17R to convert the rotational driving force of the rotary shaft 7 into motion of the right inner and outer massage members 9R and 10R, so that the right inner and outer massage members 9R and 10R are brought close to or separated from each other.

[0120]

As illustrated in FIGs. 1 to 3, the right massage section 6R of the present embodiment includes the sole pressing member 11R configured to perform pressing massage operation on the longitudinal center (the arch AR) of the sole UR of the right foot FR so as to press the arch AR from below like acupressure.

[0121]

The sole pressing member 11R of the present embodiment serves as a roller body (a rotatable body) disposed sidelong with an axis extending in the left-right direction. The sole massage roller 11R of the present embodiment is disposed between the right inner and outer massage members 9R and 10R.

[0122]

The right sole massage roller 11R is mounted to the right of the rotary shaft 7 so as to be paired with the left sole massage roller 11L. The structure of the right sole massage roller 11R is equal to the inverted and mirrored structure of the left sole massage roller 11L.

[0123]

The sole massage roller 11R (the sole pressing member 11R) is mounted to the rotary shaft 7 with the rotary shaft 7 rotatably passing through a through hole in the sole massage roller

11R. In the present embodiment, the axis of the sole message roller 11R is concentric with the axis of the rotary shaft 7. Alternatively, the axis of the sole message roller 11R may be eccentric with the axis of the rotary shaft 7.

[0124]

The sole message roller 11R of the present embodiment has a width capable of supporting the arch AR of the sole UR of the right foot FR in surface contact with the arch AR. The sole message roller 11R rotates in conjunction with the repeated swing motion of the right inner and outer message members 9R and 10R to apply a pressing message to the arch AR (the sole UR).

[0125]

As illustrated in FIGs. 2 and 3, the sole message roller 11R of the present embodiment serves as a rotatable body having a lateral width almost equal to the width of the right foot FR.

[0126]

The sole message roller 11R as the rotatable body includes a radially expanded portion 26R having a shape widened from a lateral (longitudinal) midway portion of the sole message roller 11R toward a first end of the sole message roller 11R. The first end refers to an area ranging from a position where the first radially expanded portion 26R starts to widen to an edge 24R of the first radially expanded portion 26R (a right edge 24R (an inner edge 24R) of the sole message roller 11R).

[0127]

Specifically, the first radially expanded portion 26R of the present embodiment has a shape gradually widened from the longitudinal midway portion of the sole message roller 11R toward the edge 24R that is on the nearer side to the arch AR of the right foot FR (i.e., the inside). In other words, the first radially expanded portion 26R of the present embodiment is in the form of a bell the bottom of which is directed leftward. The first radially expanded portion

26R has a shape gradually and radially expanded toward the right inner massage member 9R.

[0128]

The sole massage roller 11R of the present embodiment includes the first radially expanded portion 26R having the shape widened inward, i.e., toward the first end of the sole massage roller 11R, and a second radially expanded portion 27R having a shape widened outward, i.e., toward a second end of the sole massage roller 11R.

[0129]

The second end refers to an area ranging from a position where the second radially expanded portion 27R starts to widen to an edge 25R of the second radially expanded portion 27R (a right edge 25R (an outer edge 25R) of the sole massage roller 11R).

[0130]

The second radially expanded portion 27R of the present embodiment has a shape gradually widened from the longitudinal midway portion of the sole massage roller 11R toward the edge 25R that is on the nearer side to the outside (covering the little toe) of the right foot FR (i.e., the outside). In other words, the second radially expanded portion 27R of the present embodiment is in the form of a bell the bottom of which is directed rightward. The second radially expanded portion 27R has a shape gradually and radially expanded toward the left outer massage member 10R.

[0131]

In the sole massage roller 11R of the present embodiment, the first radially expanded portion 26R having the shape widened from the longitudinal midway portion toward the left edge 24R and the second radially expanded portion 27R having the shape widened from the longitudinal midway portion toward the right edge 25R are provided in a pair.

[0132]

In other words, the sole massage roller 11R of the present embodiment has a hourglass

shape formed of the first and second radially expanded portions 26R and 27R provided in a pair as well as the lateral midway portion narrower than the first and second radially expanded portions 26R and 27R.

[0133]

As described above, since the sole massage roller 11R includes the pair of radially expanded portions 26R and 27R respectively widened toward the left and right edges 24R and 25R (i.e., the sole massage roller 11R has the hourglass shape), the right foot FR is positioned at the center of the sole massage roller 11R without lateral shift, so that the user can be massaged reliably.

[0134]

The edge 24R of the right inner first radially expanded portion 26R (the left edge 24R of the sole massage roller 11R) is disposed adjacent to a sidewall (the right inner annular fitting portion 19R) of the right inner massage member 9R of the pair of massage members 9R and 10R.

[0135]

The term “adjacent” as used herein involves that the edge 24R of the first radially expanded portion 26R is slidably in contact with the right inner massage member 9R or a gap of several millimeters (approximately 0.1 mm to 3 mm) is defined between the edge 24R of the first radially expanded portion 26R and the right inner massage member 9R.

[0136]

In the present embodiment, the edge 25R of the right outer second radially expanded portion 27R (the right edge 25R (the outer edge 25R) of the sole massage roller 11R) is disposed adjacent to a sidewall (the right outer annular fitting portion 22R) of the right outer massage member 10R.

[0137]

The term “adjacent” as used herein involves that the edge 25R of the second radially expanded portion 27R is slidably in contact with the right outer massage member 10R or a gap of several millimeters (approximately 0.1 mm to 3 mm) is defined between the edge 25R of the second radially expanded portion 27R and the right outer massage member 10R.

[0138]

As illustrated in FIG. 3, in the present embodiment, the edge 24R (the radially widest part) of the first radially expanded portion 26R is flush with a first acupoint pressing protrusion 28R. Preferably, the edge 24R (the radius) of the first radially expanded portion 26R is equal to (is flush with) the height of the first acupoint pressing protrusion 28R or is larger than the first acupoint pressing protrusions 28R.

[0139]

The sole massage roller 11R of the present embodiment has, on its outer peripheral surface, acupoint pressing protrusions 28R, 29R, and 30R directed radially outward and spaced apart from each other in the axial direction of the rotary shaft 7 and the circumferential direction. The sole massage roller 11R of the present embodiment has a plurality of acupoint pressing protrusions 28R, 29R, and 30R different in shape from each other.

[0140]

As illustrated in FIGs. 2 and 3, the first radially expanded portion 26R is provided with the first acupoint pressing protrusions 28R configured to apply a pressing massage to the sole UR (the arch AR) of the right foot FR.

[0141]

The first acupoint pressing protrusions 28R extend from the first radially expanded portion 26R rightward, i.e., toward the second end of the sole massage roller 11R in the direction away from the right inner massage member 9R in the left-right direction.

[0142]

As illustrated in FIG. 2, the first acupoint pressing protrusions 28R extend from the edge 24R of the first radially expanded portion 26R rightward (i.e., in the direction away from the right inner massage member 9R) along the axial direction of the rotary shaft 7.

[0143]

The first acupoint pressing protrusions 28R each have a predetermined thickness and are disposed at positions corresponding to the inside (covering the arch AR) of the sole UR of the right foot FR. The first acupoint pressing protrusions 28R have corners rounded so as not to bite into the sole UR and the arch AR.

[0144]

Preferably, the heights of the first acupoint pressing protrusions 28R are equal to (are flush with) or lower than the radius of the first radially expanded portion 26R at the position of the edge 24R which is the radially widest part of the first radially expanded portion 26R (the right edge 24R of the sole massage roller 11R). In other words, preferably, the first acupoint pressing protrusions 28R each have a size not protruding beyond the edge 24R (the radially widest part) of the first radially expanded portion 26R.

[0145]

As illustrated in FIG. 3, in the present embodiment, the first acupoint pressing protrusions 28R are flush with the edge 24R (the radially widest part) of the first radially expanded portion 26R. The first acupoint pressing protrusions 28R overhang rightward from the edge 24R of the first radially expanded portion 26R (the right edge 24R of the sole massage roller 11R).

[0146]

As described above, the edge 24R of the first radially expanded portion 26R of the right sole massage roller 11R is disposed adjacent to the sidewall of the right inner massage member 9R, and the heights of the first acupoint pressing protrusions 28R are set equal to or lower than

the radius of the edge 24R which is the radially widest part of the first radially expanded portion 26R. This configuration substantially eliminates a gap between the right inner massage member 9R and each first acupoint pressing protrusion 28R.

[0147]

It is therefore possible to prevent the inside (covering the arch AR) of the right foot FR from being caught in the gap between the right inner massage member 9R and each first acupoint pressing protrusion 28R during massage operation.

[0148]

The first acupoint pressing protrusions 28R of the present embodiment each include a horizontal portion 31R extending rightward from the edge 24R of the first radially expanded portion 26R along the axial direction of the rotary shaft 7, and serving as a side of the first acupoint pressing protrusion 28L extending in the axial direction of the rotary shaft 7, a perpendicular portion 32R serving as a side of the first acupoint pressing protrusion 28L extending in the direction perpendicular to the axial direction of the rotary shaft 7, and a corner portion 33R connecting the horizontal portion 31R and the perpendicular portion 32R.

[0149]

The first acupoint pressing protrusions 28R each have an approximately triangular flat surface 34R defined by the horizontal portion 31R, the perpendicular portion 32R, the corner portion 33R, and an oblique side of the first radially expanded portion 26R. In addition, the first acupoint pressing protrusions 28R are protrusions protruding wide and rightward along the axial direction of the rotary shaft 7.

[0150]

As illustrated in FIG. 3, the first acupoint pressing protrusions 28R of the present embodiment are protrusions each protruding large and rightward from the edge 24R of the first radially expanded portion 26R and having a large and horizontally oriented shape to an extent

that each first acupoint pressing protrusion 28R has the flat surface 34R. The first acupoint pressing protrusions 28R are provided in a pair with the rotary shaft 7 interposed therebetween.

[0151]

Referring back to FIG. 2, the horizontal portion 31R extends long and rightward from the edge 24R of the first radially expanded portion 26R along the axial direction of the rotary shaft 7.

[0152]

As illustrated in FIG. 3, the horizontal portion 31R is located at the same height as the edge 24R which is the radially widest part of the first radially expanded portion 26R. In other words, the horizontal portion 31R serves as a long side extending straight and rightward from the edge 24R of the first radially expanded portion 26R (the left edge 24R of the sole massage roller 11R) along the axial direction of the rotary shaft 7.

[0153]

As described above, since the horizontal portion 31R serves as the side extending long and rightward from the edge 24R of the first radially expanded portion 26R (the left edge 24R of the sole massage roller 11R), the horizontal portion 31R is capable of supporting the sole UR (the arch AR) of the right foot FR in surface contact with the sole UR (the arch AR).

[0154]

The perpendicular portion 32R serves as a side extending perpendicularly from an end of the horizontal portion 31R. The corner portion 33R is located at a distal end of the horizontal portion 31R. The perpendicular portion 32R hangs down from the corner portion 33R in the axial direction of the rotary shaft 7. The corner portion 33R has a shape capable of strongly pressing the arch AR (the sole UR). On the other hand, the corner portion 33R is rounded so as not to excessively bite into the arch AR (the sole UR).

[0155]

The horizontal portion 31R and the corner portion 33R may be located lower than a lateral extension of the edge 24R of the first radially expanded portion 26R.

[0156]

As described above, since the first acupoint pressing protrusions 28R each include the horizontal portion 31R, the perpendicular portion 32R, and the corner portion 33R (i.e., has the horizontally oriented shape as illustrated in FIG. 3), the first acupoint pressing protrusions 28R are capable of stably supporting the right foot FR at the horizontal portions 31R and preventing the right foot FR from sinking. In addition, since the first acupoint pressing protrusions 28R each include the corner portion 33R, the first acupoint pressing protrusions 28R are capable of effectively applying a pressing massage like strong acupressure to the arch AR (the sole UR).

[0157]

Since the first acupoint pressing protrusions 28R of the present embodiment have the horizontally oriented shape and are axially provided in a pair at equal intervals, the first acupoint pressing protrusions 28R are capable of applying a pressing massage like strong acupressure to the arch AR of the right foot FR with a predetermined rhythm (at 180° intervals) while stably supporting the right foot FR.

[0158]

If an elongated and tapered acupoint pressing protrusion is used, an excessively strong pressing massage is applied to a sole in some cases. According to the present embodiment, on the other hand, the first radially expanded portion 26R and the horizontally oriented first acupoint pressing protrusions 28R provided on the first radially expanded portion 26R are capable of effectively applying a pressing massage to the sole UR (the arch AR).

[0159]

The shapes of the first acupoint pressing protrusions 28R of the present embodiment prevent the fabric cover (the liner) of the treatment recess portion 4R from being caught on the

first acupoint pressing protrusions 28R and therefore prevent the fabric cover from shedding lint.

[0160]

The second radially expanded portion 27R is provided with the second acupoint pressing protrusions 29R. The second acupoint pressing protrusions 29R are disposed at positions corresponding to the outside (covering the little toe) of the sole UR of the right foot FR. The second acupoint pressing protrusions 29R are disposed facing the first acupoint pressing protrusions 28R in the axial direction of the rotary shaft 7.

[0161]

The second acupoint pressing protrusions 29R protrude small and radially outward and are provided in a pair with the rotary shaft 7 interposed therebetween. The second acupoint pressing protrusions 29R are capable of applying a pressing massage like soft acupressure to the outside of the foot with a predetermined rhythm (at 180° intervals).

[0162]

With regard to the sizes of the acupoint pressing protrusions 28R and 29R of the present embodiment, the first acupoint pressing protrusions 28R for pressing the inside (covering the arch AR) of the right foot FR are large. On the other hand, the second acupoint pressing protrusions 29R for pressing the outside (covering the little toe) of the right foot FR are smaller than the first acupoint pressing protrusions 28R.

[0163]

Alternatively, the second acupoint pressing protrusions 29R may be equal in shape to the first acupoint pressing protrusions 28R and may be provided on the second radially expanded portion 27R so as to face the first acupoint pressing protrusions 28R. In other words, the first acupoint pressing protrusions 28R may be provided on the left and right radially expanded portions 26R and 27R so as to face each other in the axial direction of the rotary shaft 7.

[0164]

Since the acupoint pressing protrusions 28R and 29R face each other, the acupoint pressing protrusions 28R and 29R are capable of applying a pressing massage like acupressure to the inside (covering the arch AR and the big toe) of the right foot FR and the outside (covering the little toe) of the right foot FR at the same timing. In addition, the right foot FR can be brought close to the center of the sole massage roller 11R.

[0165]

The third acupoint pressing protrusions 30R are disposed at positions corresponding to the center of the sole UR of the right foot FR. The third acupoint pressing protrusions 30R protrude large and radially outward and are provided in a pair with the rotary shaft 7 interposed therebetween. The size, shape, arrangement, and the like of the third acupoint pressing protrusions 30R are optionally settable. The third acupoint pressing protrusions 30R are capable of applying a pressing massage like strong acupressure to the sole UR with a predetermined rhythm (at 180° intervals).

[0166]

As described above, the sole massage roller 11R of the lower limb massage machine 1 of the present disclosure is disposed between the pair of left and right massage units 9R and 10R and serves as the hourglass-shaped roller body including the radially expanded portion 26R that has the shape widened toward the edge 24R of the first end and is provided with the horizontally oriented acupoint pressing protrusions 28R each including the horizontal portion 31R, the perpendicular portion 32R, and the corner portion 33R, and the second radially expanded portion 27L. It is therefore possible to stably support the right foot FR without lateral shift of the right foot FR. It is also possible to apply an effective pressing massage to the sole UR (the arch AL) by moderately pressing the sole UL (the arch AR) while preventing the sole UR (arch AR) from being pressed excessively.

[0167]

It should be understood that embodiments disclosed herein are illustrative and are not restrictive in all respects. Especially, as matters that are not explicitly described in the embodiments disclosed herein, such as activating conditions or operating conditions, and dimensions, weights, and the like of constituents, matters are adopted that can be easily conceived by a person skilled in the art without departing from the scope of ordinary implementations by a person skilled in the art.

[0168]

In the present embodiment, the shapes of the massage members 9 and 10 (kneading plates 9 and 10), the inclination angles of the massage members 9 and 10 with respect to the rotary shaft 7, the distance between the pair of massage members 9 and 10, and the like are changeable as appropriate in view of a treatment range. The massage members 9 and 10 each may be an air bag configured to repeatedly expand and contract, thereby massaging the foot F.

REFERENCE SIGNS LIST

[0169]

- 1 lower limb massage machine
- 2 massage mechanism
- 6L left massage section
- 6R right massage section
- 7 rotary shaft
- 8 driver
- 9L left inner massage member
- 9R right inner massage member
- 10L left outer massage member
- 10R right outer massage member

11L sole massage roller
11R sole massage roller
24L first edge
24R first edge
25L second edge
25R second edge
26L first radially expanded portion
26R first radially expanded portion
27L second radially expanded portion
27R second radially expanded portion
28L first acupoint pressing protrusion
28R first acupoint pressing protrusion
29L second acupoint pressing protrusion
29R second acupoint pressing protrusion
31L horizontal portion
31R horizontal portion
32L perpendicular portion
32R perpendicular portion
33L corner portion
33R corner portion
34L flat surface
34R flat surface
FL left foot
FR right foot
UL sole

UR sole

AL arch

AR arch

CLAIMS

[Claim 1] A sole pressing member of a lower limb massage machine including a pair of left and right massage members configured to apply a kneading massage to a foot with the foot sandwiched between the pair of left and right massage members, and a rotary shaft having an axis extending in a left-right direction,

 the sole pressing member being disposed between the pair of left and right massage members and mounted to the rotary shaft so as to rotate together with the rotary shaft,

 the sole pressing member serving as a roller body disposed sidelong with an axis extending in the left-right direction,

 the sole pressing member as the roller body comprising at least a radially expanded portion having a shape widened toward a first end of the sole pressing member,

 wherein the radially expanded portion has an edge located adjacent to one of the pair of left and right massage members,

 wherein the radially expanded portion is provided with an acupoint pressing protrusion configured to apply a pressing massage to the sole, and

 wherein the acupoint pressing protrusion extends from the radially expanded portion toward a second end of the sole pressing member in a direction away from the one of the pair of left and right massage members in the left-right direction.

[Claim 2] The sole pressing member of the lower limb massage machine according to claim 1,

 the sole pressing member comprising a pair of the radially expanded portions including a first radially expanded portion having a shape widened toward the first end and a second radially expanded portion having a shape widened toward the second end.

[Claim 3] The sole pressing member of the lower limb massage machine according to claim 2,

the sole pressing member comprising a lateral midway portion disposed between the first radially expanded portion and the second radially expanded portion, and having a hourglass shape formed of the first radially expanded portion and the second radially expanded portion provided in a pair as well as the lateral midway portion narrower than the first radially expanded portion and the second radially expanded portion.

[Claim 4] The sole pressing member of the lower limb massage machine according to claim 3,

wherein the first radially expanded portion has an edge located adjacent to one of the pair of left and right massage members, and

wherein the second radially expanded portion has an edge located adjacent to the other of the pair of left and right massage members.

[Claim 5] The sole pressing member of the lower limb massage machine according to claim 1,

wherein a height of the acupoint pressing protrusion is equal to or lower than a radius of the radially expanded portion at a position of the edge which is a radially widest part of the radially expanded portion.

[Claim 6] The sole pressing member of the lower limb massage machine according to claim 5,

wherein the acupoint pressing protrusion includes a horizontal portion extending in the left-right direction, a perpendicular portion extending in a direction perpendicular to the left-right direction, and a corner portion connecting the horizontal portion and the perpendicular portion.

[Claim 7] The sole pressing member of the lower limb massage machine according to claim 2,

wherein the first radially expanded portion is provided with a first acupoint pressing protrusion,

wherein the first acupoint pressing protrusion serves as the acupoint pressing protrusion extending in the left-right direction,

wherein the second radially expanded portion is provided with a second acupoint pressing protrusion, and

wherein the first acupoint pressing protrusion and the second acupoint pressing protrusion face each other in the left-right direction.

[Claim 8] The sole pressing member of the lower limb massage machine according to claim 7,

wherein a height of the first acupoint pressing protrusion is higher than or equal to a height of the second acupoint pressing protrusion.

[Claim 9] The sole pressing member of the lower limb massage machine according to claim 7,

wherein the first radially expanded portion is provided with a plurality of the first acupoint pressing protrusions arranged in a circumferential direction of the first radially expanded portion and/or the second radially expanded portion is provided with a plurality of the second acupoint pressing protrusions arranged in a circumferential direction of the second radially expanded portion.

[Claim 10] The sole pressing member of the lower limb massage machine according to claim 1,

wherein at least one of the pair of left and right massage members has a base end that is inclined with respect to the rotary shaft and has a through hole, and

wherein the edge of the radially expanded portion of the roller body is inclined so as to be adjacent to a sidewall of the at least one of the pair of left and right massage members.