LOWER LIMB MASSAGING MACHINE

Technical Field

[0001]

The present invention relates to a lower limb massaging machine suitable for massaging a lower limb.

Background Art

[0002]

Conventionally, there has been developed a lower limb massaging machine capable of massaging a lower limb of a human body, for example, as shown in Patent Literature 1.

A lower limb massaging machine disclosed in Patent Literature 1 includes: a plurality of massaging bags installed so as to encase a surrounding of a user's leg and performing a massage of the leg expanded and contracted by compressed air; a massaging device main body for controlling supply/discharge of the compressed air; and an air supply tube for supplying the compressed air from the massaging device main body to the massaging bags.

Citation List

Patent Literature

[0003]

Patent Literature 1: Japanese Unexamined Patent Publication JPA-2011-30948

Summary of Invention

Technical Problem

[0004]

In recent years, however, various demands have been requested from users.

For example, regarding the lower limb massaging machine as disclosed in Patent Literature 1 (particularly as shown in Fig. 1 of Patent Literature 1), the device per se is a large-scaled one and it is necessary to attach a boots-shaped massaging member so as to wrap around a lower limb, and it is very time-consuming for attachment and hard to use, and therefor there is a demand for wishing to have a development of a lower limb massaging machine which is easy to attach and detach a lower limb. Further, there is also a demand for wishing to have a development of a lower limb massaging machine capable of installation in various places.

[0005]

Therefore, in consideration of the above problems, the present invention has an object to provide a lower limb massaging machine having the number of components of the lower limb massaging machine reduced by compactly

storing a pair of tubular members performing a pressure massage to lower limbs, making it possible to install the lower limb massaging machine in various places, and allowing a user to perform a massage of the lower limbs at a desired place.

Solution to Problem

[0006]

In order to accomplish the object mentioned above, the following technical means has been taken in the present invention.

A lower limb massaging machine according to the present invention includes: a pair of tubular members formed in L-character shapes in a side view into which lower limbs of a user can be inserted from opened upper parts; an air bag provided on each of the tubular members and performing a pressure massage to the inserted lower limb; and a pump supplying air to the air bag, and in this configuration, the tubular members are supported side by side in the left and right inside a case body, and at least one surface of a front surface, side surfaces in the left and right direction and a rear surface of each of the tubular members is served as a supporting surface supported by the case body.

[0007]

Preferably, in a non-supporting surface different from the supporting surface, there is formed a cut portion along an insertion direction of each of the lower limbs.

Preferably, the front surface of the tubular member and/or inner side surface in the left and right direction of the tubular member is served as the supporting surface and the rear surface of the tubular member and/or outer side surface in the left and right direction of the tubular member is served as the non-supporting surface, and a line zipper or a surface zipper is used in the cut portion.

[0008]

Preferably, the pump is provided in the middle of the pair of left and right tubular members.

Preferably, the tubular members are formed in the L-character shapes in combination of a horizontal tubular member oriented in the horizontal direction and a vertical tubular member oriented in the vertical direction, a first air bag is provided on an upper side surface of the horizontal tubular member, a second air bag is provided on a lower side surface of the vertical tubular member, and a third air bag is provided on an upper side surface of the vertical tubular member.

[0009]

Preferably, on a lower part of said tubular member,

there is provided a massaging member performing a pressure massage to an inserted sole.

Preferably, a rotary rotating roller is adopted to the massaging member.

Advantageous Effects of Invention

[0010]

Regarding the lower limb massaging machine according to the present invention, the number of components of the lower limb massaging machine is reduced by compactly storing a pair of tubular members, making it possible to install the lower limb massaging machine in various places, and allowing a user to perform a massage of the lower limbs at a desired place.

Brief Description of Drawings

[0011]

Fig. 1 is a perspective view of a lower limb massaging machine according to the present invention.

Fig. 2 is a forward perspective view of an internal structure of the lower limb massaging machine of the present invention.

Fig. 3 is a side view showing the internal structure of the lower limb massaging machine of the present invention.

Fig. 4 is a rearward perspective view showing the

internal structure of the lower limb massaging machine of the present invention.

Fig. 5 is a rear view of the lower limb massaging machine of the present invention.

Fig. 6 is a plan view of the lower limb massaging machine of the present invention.

Fig. 7 is a forward perspective view showing an internal structure of a massaging member in the case of adopting a roller.

Fig. 8 is a forward perspective view showing an internal structure of a massaging member in the case of adopting a projection.

Description of Embodiments

[0012]

The following describes an embodiment of a lower limb massaging machine according to the present invention with reference to the drawings.

Figs. 1 to 8 show a configuration and use mode of a lower limb massaging machine 1 according to the present invention.

Note that, in the present specification, "calf C" refers to a portion below a knee and upper than an ankle in a lower limb L of a human body, and "foot" refers to a portion below a knee and lower than an ankle in the

lower limb L of a human body. Further, “heel H” refers to a portion generally beneath an ankle and a portion of a rear side of the foot. Further, “instep F” refers to a horizontal intermediate portion of a foot and an upper side portion opposite to an arch.

[0013]

Note that, in the following description, a left and right direction in Fig. 3 refers to a back and forth direction in an actual device, and a vertical direction in Fig. 3 refers to a vertical direction in an actual device. A paper-surface penetrating direction in Fig. 3 refers to a left and right direction or a width direction in an actual device. These directions are shown by arrow marks in each of the drawings and are coincident with the directions viewed from a user who inserts the lower limbs L in the lower limb massaging machine 1.

As shown in Figs. 1 to 6, the lower limb massaging machine 1 is made it possible to perform a massage of the lower limbs L (calfs C, heels H, insteps F and the like) of a user sitting on such as, for example, a chair. Inside this lower limb massaging machine 1, there are mounted air bags 10a to 10c (air bag) for performing a pressure massage to the lower limbs L of a user.

[0014]

This lower limb massaging machine 1 includes: a pair

of tubular members 5 each of which is formed in an L-character shape in a side view into which the lower limb L of a user can be inserted from an opened upper part; air bags 10a to 10c provided in the tubular member 5 to perform a pressure massage to the inserted lower limb L; and a pump 12 for supplying pressurized air to the air bags 10a to 10c.

Further, this lower limb massaging machine 1 includes a case body 2 (casing) of a generally triangular shape in a side view, and one pair of the tubular members 5 (treating parts) are supported side by side in the left and right inside this case body 2. That is, the lower limb massaging machine 1 of the present invention has a configuration of one pair of the tubular members 5 and the case body 2 being integrally formed.

[0015]

As shown in Figs. 1 to 6, since the tubular members 5 are provided in a rear surface side of the case body 2, the lower limb massaging machine 1 of the present embodiment has a structure so that the user inserts the lower limbs L towards the forward lower sides from the rearward upper sides (above the rear sides) of the tubular members 5.

Further, the lower limb massaging machine 1 of the present embodiment is configured to be able to

selectively perform each of massaging operations of the calf C, heel H and instep F in addition to the massaging operation of the entire lower limbs L as described above.

[0016]

As shown in Fig. 1, the case body 2 is a housing which includes a front cover 2a, rear cover 2b and bottom part 2c and stores such as the tubular members 5 and a pump 12 (both to be described later). The case body 2 is formed to be a horizontally long or vertically long rectangle or a square shape in a front view and formed to be an L character (boots) shape substantially the same as the shape of the tubular members 5 in a side view.

Further, as shown in Fig. 5, in the rear surface side of the case body 2, there are formed a pair of insertion concave parts 3 continuously opened from the lower part side of the case body 2 to the top end of the case body 2 at a predetermined interval in the left and right direction. The tubular members 5 are fitted into these left and right insertion concaves 3.

[0017]

As shown in Figs. 1 and 3, the front cover 2a is a plate material formed in a downward convex shape in a side view and is formed to have a size coverable over the front surfaces of the paired tubular members 5. Further, on the rear surface side of the front cover 2a,

there are formed a pair of left and right R surfaces 4 corresponding to the upper parts of the front surfaces of the tubular members 5 and the R surfaces 4 are formed to closely contact with the above-mentioned curved front surfaces (supporting surfaces 6 to be described later) of the tubular members 5. In this way, by closely contacting the R surfaces 4 with the curved front surfaces, the tubular members 5 are supported so as to stand.

[0018]

As shown in Figs. 5 and 6, the rear cover 2b is an inverse T-character shaped member in a rear view and it has a shape of generally vertically extending from the upper part to the lower part and being divided into two in the lower part thereof in the generally horizontal direction.

The outer side edges of the upper part of the rear cover 2b are formed to correspond to the inner side surfaces in the left and right direction of the tubular members 5 and closely contact with the inner side surfaces in the left and right direction of the tubular members 5. Thus, by closely contacting the outer side edges of the upper part of the rear cover 2b with the inner side surfaces in the left and right direction of the tubular members 5, the tubular members 5 are supported so as to stand.

[0019]

On the other hand, the upper side edges of the lower part (divided into two parts in the horizontal direction) of the rear cover 2b are formed to correspond to the rear surfaces of the lower end parts of the tubular members 5.

Further, on the upper part of the rear cover 2b, there is disposed a driving operation switch 22 making the pressure massaging operation switchable, and a handle 23 for rendering to be handy portable is provided in the intermediate part in the vertical direction thereof. Further, in the lower part of the rear cover 2b, there are provided: a power switch 24 for supplying electric power to the pump 12 and an electric motor 19; and a power code 25 for receiving the electric power supply from an external portion.

[0020]

A space surrounded by the R surface 4 of the front cover 2a, the outer side edge of the upper part of the rear cover 2b and the upper side edge of the lower part of the rear cover 2b as described above is defined as the insertion concave part 3 for fitting the tubular member 5 therein.

On the other hand, the bottom part 2c is a dish-shaped plate material on which massaging members

14 (rotating rollers) for massaging soles, a rotating shaft 16 for rotating the massaging members 14, an electric motor 19 for driving the rotating shaft 16 and a solenoid valve 13 for controlling an amount of the air to be supplied to the air bags 10a to 10c (these are to be described later).

[0021]

Two supporting members 17 are stood on the bottom part 2c for supporting the rotating shaft 16 of the massaging members 14 and support the both end portions in the longitudinal direction of the rotating shaft 16 and an intermediate portion thereof. Bearings 18 (bearings) are disposed on the upper parts of these supporting members 17 to freely rotatably support the rotating shaft 16.

That is, the case body 2 is formed so as to cover the front sides of the paired tubular members 5.

[0022]

As shown in Figs. 2 to 4, the tubular member 5 is a treating part formed in an L-character shape in a combination of a horizontal tubular member 5a oriented in the horizontal direction and a vertical tubular member 5b oriented in the vertical direction, and the tubular member 5 is supported by the case body 2 in a substantially upright state. The tubular member 5 is a bottomed member

having a predetermined thickness formed of such as cloth having flexibility, and the horizontal tubular member 5a covers an instep F to a toe of a foot and the vertical tubular member 5b covers a heel H to a calf C.

[0023]

In the following description, since the paired left and right tubular members 5 are the same, the description is made focusing on the tubular member 5 into which the left side lower limb L of a user is inserted.

Since this tubular member 5 is formed of such as cloth having flexibility, it is applicable to various shapes of the lower limbs L.

At least one surface of the front surface, side surfaces in the left and right direction and rear surface of this tubular member 5 (vertical tubular member 5b) is served as the supporting surface 6 to be supported by the case body 2, and in the present embodiment, the front surface of the vertical tubular member 5b and the inner side surfaces of the vertical tubular member 5b are served as the supporting surface 6. On the other hand, the rear surface of the vertical tubular member 5b and the outer side surfaces in the left and right direction of the vertical tubular member 5b are served as a non-supporting surface 7.

[0024]

The supporting surface 6 is a surface corresponding to the R surface 4 formed on the front cover 2a of the case body 2 mentioned above, outer side edge of the upper part of the rear cover 2b and the upper side edge of the lower part of the rear cover 2b and this supporting surface 6 is supported in close contact with the R surface 4, outer side edge of the upper part of the rear cover 2b and the upper side edge of the lower part of the rear cover 2b.

Further, in the non-supporting surface 7 which is a surface different from the supporting surface 6, there is formed a cut part 8 along the insertion direction of the lower limb L. In specific, the cut part 8 is cut into from the upper end of the rear surface side of the vertical tubular member 5b to the lower end like a line elongated in the vertical direction. By this cut part 8, the tubular member 5 is expandable in the width (left and right) direction and this makes it easy to attach and detach the lower limb L. Further, the cut part 8 is provided with an engagement member 9 such as, for example, a line zipper or a surface zipper (merely referred to as “zipper 9” hereinafter). By pulling down the zipper 9 (engagement member), it is possible to facilitate insertion of the lower limb L by opening the tubular member 5. Further, by pulling up the zipper 9, the lower

limb L inserted into the tubular member 5 can be surely fixed.

[0025]

In the outer periphery of this tubular member 5, there are provided a plurality of air bags 10a to 10c (lower limb massaging mechanism) for performing a pressure massage to the lower limb L.

More specifically, the first air bag 10a is provided on the upper side surface of the horizontal tubular member 5a of the tubular member 5, a pair of the second air bags 10b are provided on the lower side surface of the vertical tubular member 5b and a pair of the third air bags 10c are provided on the upper side surface of the vertical tubular member 5b.

[0026]

As shown in Figs. 2 to 4, the first air bag 10a to third air bag 10c are bag bodies formed to be able to store the pressurized air from the pump 12 and these bags are freely expandably and contractably formed so as to be largely expandable. As a shape of each of the first air bag 10a to third air bag 10c, such as, for example, a “rectangular shaped bag body” and an “elliptical shaped bag body” can be exemplified. Note that the shapes of the first air bag 10a to third air bag 10c are not especially limited so long as the pressure massage can

be performed to the lower limb L.

[0027]

At least one first air bag 10a is disposed on the upper side surface of the horizontal tubular member 5a and this first air bag 10a is intended to pressurize the horizontal tubular member 5a downward from the upper side surface.

This first air bag 10a has a size which can cover the outer peripheral surface from one end to the other end of the lower part (bottom) of the horizontal tubular member 5a in the width direction, i.e., the whole surface except for the lower part (bottom) of the horizontal tubular member 5a. That is, the first air bag 10a has a size substantially the same as the area of the upper side surface of the horizontal tubular member 5a together with the inner and outer side surfaces continuous to the upper side surface thereof.

[0028]

Further, this first air bag 10a is provided with an air supply hose 11 for supplying air fed out from the pump 12 to expand the first air bag 10a. Thus, by expanding the first air bag 10a, the pressure massage is performed to the instep F and the periphery thereof (such as a toe of a foot) inserted into the horizontal tubular member 5a.

A pair of the second air bags 10b are disposed in the lower side of the inner side surface and outer side surface of the vertical tubular member 5b in the width direction, and each of these second air bags 10b is intended to pressurize the lower side of the vertical tubular member 5b toward the inner part from the outside.

[0029]

Each of the paired second air bags 10b has a size covering substantially the whole surface of the lower side of the inner side surface and outer side surface in the width direction of the vertical tubular member 5b. More specifically, the area of the second air bag 10b is an extent capable of covering the lower surface having a height of the lower side from the intermediate part in the vertical direction of the vertical tubular member 5b and a width of a side surface surrounded over from the front end to the rear end of the vertical tubular member 5b (lower half side surface of the vertical tubular member 5b).

Further, each the paired second air bags 10b is provided with an air supply hose 11 for supplying air fed out from the pump 12 to expand the second air bags 10b. Thus, by expanding each of the second air bags 10b, the pressure massage is performed to the inner side surface and outer side surface of a heel H inserted into

each of the vertical tubular members 5b, from the outside in the width direction.

[0030]

Further, this second air bag 10b is disposed so that the front end side thereof overlaps (overlap) the rear end side of the first air bag 10a. In specific, the front end side of the second air bag 10b is disposed so as to be overlapped by the rear end side of the first air bag 10a. By disposing in this way, the pressure massage can be uniformly applied to a range from the heel H to the tip of the foot.

A pair of the third air bags 10c are provided on the upper side of the inner side surface and outer side surface in the width direction of the vertical tubular member 5b, and each of these third air bags 10c is intended to pressurize the vertical tubular member 5b toward the inner part from the outside of the upper side.

[0031]

Each of the paired third air bags 10c has a size covering substantially the whole surface of the upper side of the inner side surface and outer side surface in the width direction of the vertical tubular member 5b. More specifically, the area of the second air bag 10b is an extent capable of covering a height and a width, the height being defined by the upper side from the

intermediate part in the vertical direction of the vertical tubular member 5b and the width being defined by a side surface (upper half side surface of the vertical tubular member 5b) surrounded over from the front end to the rear end of the vertical tubular member 5b.

Further, each the paired third air bags 10c is provided with an air supply hose 11 for supplying air fed out from the pump 12 to expand each of the third air bags 10c. Thus, by expanding each of the third air bags 10c, the pressure massage is performed to the inner side surface and outer side surface of a calf C inserted into each of the vertical tubular members 5b, from the outside in the width direction.

[0032]

The first to third air bags 10a to 10c mentioned above can be respectively independently operated for expansion and contraction. For example, in the case of performing the pressure massage of only the instep F, only the first air bag 10a can be operated for expansion and contraction, and in the case of performing the pressure massage to the heel H and calf C, the second and third air bags 10b and 10c can be operated for expansion and contraction.

[0033]

Note that, since the tubular member 5 and the air

bags 10a to 10c disposed in the right side are the same as those in the left side, the explanation thereof is omitted.

Further, inside the case body 2, there are stored: the pump 12 (compressor) for supplying pressurized air to the air bags 10a to 10c and expanding the air bags 10a to 10c; a solenoid valve 13 for switching between introduction of the air to the air bags 10a to 10c and discharge of the air from the air bags 10a to 10c; and a control device 21 for controlling this solenoid valve 13.

[0034]

The pump 12 is provided in the middle of the left and right tubular members 5 disposed in a pair and connected to the solenoid valve 13 via the hose. The pump 12 feeds out the pressurized air to the solenoid valve 13, and after passing through the solenoid valve 13, the air is supplied to each of the air bags 10a to 10c.

The solenoid valve 13 is disposed on the bottom part 2c and connected to the hose attached to each of the air bags 10a to 10c. This solenoid valve 13 is controlled by the control device 21 and feeds out the air fed out from the pump 12 to the predetermined air bags 10a to 10c.

[0035]

The control device 21 is incorporated with a plurality of pressure massage programs and controls the expansions of the air bags 10a to 10c by each program.

Thus, the user can select a desired pressure massage for the lower limb L.

On the other hand, under the lower parts of the left and right paired tubular members 5, there are respectively provided massaging members 14 for performing the pressure massages to the soles of the inserted lower limbs L, and cylindrical rotating rollers 14 are used as the massaging members 14. Further, under the lower parts of the left and right paired tubular members 5, there is provided a rotating shaft 16 so as to bridge over in the width direction of the bottom part 2c of the case body 2.

[0036]

The paired rotating rollers 14 mentioned above are attached to the rotating shaft 16, and upon rotating operation of this rotating shaft 16, also the rotating rollers 14 is co-rotated to perform the pressure massage to the soles.

Further, a gear box 20 is coupled with this rotating shaft 16, and the rear side of this gear box 20 is coupled with an electric motor 19 for rotationally driving the rotating shaft 16.

[0037]

As shown in Fig. 7, one rotating shaft 16 is provided so as to bridge over from the one end side of the bottom part 2c to the other end side in the middle in the back and forth direction of the bottom part 2c of the case body 2 so that the shaft center of the rotating shaft 16 is oriented in the width direction of the bottom part 2c on the horizontal surface.

Both end sides of this rotating shaft 16 is freely rotatably supported by the supporting members 17 which is stood from the bottom part 2c of the case body 2, and the middle of the rotating shaft 16 is supported by the gear box 20. Therefore, this rotating shaft 16 is supported by three points of the gear box 20 and the supporting members 17.

[0038]

Each of the supporting members 17 is formed of a plate material having a predetermined thickness and a bearing 18 (bearing) for freely rotatably supporting the rotating shaft 16 is fitted into the upper part thereof.

The rotating rollers 14 (massaging members) for performing the pressure massages to the soles are respectively provided on the rotating shaft 16 at a position corresponding to the lower part of the tubular member 5 between the supporting member 17 at one end side

and the gear box 20 and provided on the rotating shaft 16 at a position corresponding to the lower part of the tubular member 5 between the gear box 20 and the supporting member 17 at the other end side.

[0039]

As shown in Fig. 7, the paired rotating rollers 14 have the inner parts through which the long sized rotating shaft 16 penetrates in a skewering state and the rotating rollers 14 and the rotating shaft 16 are intended to be co-rotated about the same shaft center.

This rotating roller 14 has an outer diameter in a degree of being able to support the arch of the sole in a surface contacting state and has an outer peripheral surface concentric or eccentric with the rotating shaft 16, and on the outer peripheral surface, there are provided a plurality of projection parts 15a and 15b respectively having different shapes, at intervals in the circumferential direction and the axial direction of the rotating shaft 16.

[0040]

For example, a pair of first projection parts 15a each of which is largely projected in a radially outward direction and having an end part formed in a semicircular arc-shaped state can apply pressure massages as to be strongly finger-pressed at a predetermined interval.

Further, second projection parts 15b each of which is small projected in a radially outward direction can apply pressure massages as to be weakly finger-pressed. That is, upon rotation of the rotating roller 14 which is respectively provided with a plurality of projection parts 15a and 15b having different shapes, multiple pressure massages can be applied to the sole.

[0041]

Further, when the first to third air bags 10a to 10c repeat the expansion and contraction operations mentioned above, this rotating roller 14 rotates while interlocking with them.

By the way, the electric motor 19 disposed in the rear of the lower parts of the tubular members 5 has one rotary drive shaft thereof projected in a forward direction and a worm gear (not shown) is attached to the rotary drive shaft. On the other hand, a worm wheel (not shown) is attached to a middle in the longitudinal direction of the rotating shaft 16 and the worm gear engages with this worm wheel. These worm gear and worm wheel are built in the gear box 20 and a rotating drive force of the electric motor 19 is to be transmitted to the rotating shaft 16 via them.

[0042]

The rotating operation of the rotating roller 14

(massaging member) described above is controlled by the control device 21 mentioned above. That is, the control device 21 is intended to control the expansion and contraction operation of the air bags 10a to 10c and the rotating operation of the rotating roller 14.

Further, as shown in Fig. 8, a massaging member 26 for performing a pressure massage to an inserted sole may have a configuration of placing a plate material on which a plurality of projections 27a and 27b are formed, on the bottom part 2c of the case body 2.

[0043]

In this case, the massaging member 26 has a slightly shortish length than the length in the back and forth direction of the bottom part 2c, and a plate material formed to have a width substantial the same as the width of the tubular member 5 and provided with a plurality of projections 27a and 27b is disposed between the lower part and the bottom part 2c of the tubular member 5 to thereby apply a pressure massage to the sole of the lower limb L inserted into the tubular member 5.

For example, it is preferable that, a large projection (first projection 27a) is formed in the intermediate portion in the back and forth direction of the plate material 26 to thereby apply a pressure massage to the arch of the foot and that a plurality of slightly

smallish projections (second projection 27b) are formed in the front side and rear side of the plate material 26 to thereby apply a pressure massage to the entire sole (sole of the foot).

[0044]

Next, based on a situation of using the lower limb massaging machine 1 shown in Figs. 1 to 7, the operation thereof is described.

In the lower limb massaging machine 1, when the power switch 24 or the driving operation switch 22 is in an off state, the first to third air bags 10a to 10c are in a constructed state and the rotating roller 14 is stopped as shown in Figs. 2 to 4.

[0045]

Therefore, first of all, the user pulls down the zippers 9 (engagement member) to open the tubular members 5 and the left and right lower limbs L are fitted into the tubular members 5. Then, the instep F is disposed in the position of the first air bag 10a, the heel H is disposed on the second air bag 10b and the calf C is disposed on the third air bag 10c. Then the zipper 9 is pulled up to fix the lower limb L.

Upon turning on the power switch 24 or the driving operation switch 22 in this state, the pump 12 and the electric motor 19 are operated.

[0046]

By the pump 12, the pressurized air is supplied to the first to third air bags 10a to 10c via the solenoid valve 13. By the electric motor 19, the outputted driving force is transmitted to the rotating shaft 16 via the worm gear and worm wheel to thereby rotate the rotating shaft 16. At this time, the first to third air bags 10a to 10c and the rotating roller 14 (massaging member) are configured to interlock together.

[0047]

In the first to third air bags 10a to 10c, upon starting the expansion by supplying the air, the instep F is pressurized by the first air bag 10a, the side surface in the width direction of the heel H is pressurized by the second air bag 10b and the side surface in the width direction of the calf C is pressurized by the third air bag 10c, and the lower limb L becomes in a state of being effectively pressure-massaged.

On the other hand, in the rotating roller 14, the driving force of the electric motor 19 is transmitted to the rotating shaft 16 to thereby rotate the rotating roller 14 serving as the massaging member 14, and consequently the pressure massage is applied to the sole. At this time, upon expansion of the first air bag 10a, the first air bag 10a presses the instep F (foot per se)

downward from the upper side and the sole is compressed against the rotating roller 14 to thereby effectively perform the pressure massage of the sole. Furthermore, upon expansion of the second air bag 10b, the foot is suppressed from movement to the left and right by the second air bag 10b, and the massaging effect of the rotating roller 14 to the sole strongly exerts.

[0048]

Further, by performing the expansion and contraction operation in a manner that, the first air bag 10a is expanded, and thereafter the first air bag 10a is contracted while the second air bag 10b is expanded, and further thereafter the second air bag 10b is contracted while the third air bag 10c is expanded, it becomes possible to feed blood of the lower limb L upward (upper than a femur) and the blood circulation of the lower limb L can be promoted.

[0049]

According to the lower limb massaging machine 1 described above, the number of components of the lower limb massaging machine 1 is reduced by compactly storing the paired tubular members 5, making it possible to be installed in various places, and allowing a user to perform a massage of the lower limbs L at a desired place.

By the way, it should be considered that the

embodiments disclosed this time are exemplified ones in all of the points but not limited ones. The scope of the present invention is shown by a range of claims but not by the above description, and it is intended to include all of the modifications within the meanings and range equivalent to the claims.

[0050]

For example, although a configuration of forming the cut part 8 in the back surface of the tubular member 5 is described in the present embodiment, the cut part 8 may be formed on the outer side surface in the left and right direction of the tubular member 5.

Further, although the lower limb massaging machine 1 supporting (covering) the front surface side of the tubular member 5 with the case body 2 is exemplified and described, this lower limb massaging machine 1 is one example and, for example, the lower limb massaging machine 1 supporting the rear surface side of the tubular member 5 with the case body 2 may be used.

[0051]

Then, it is preferable that the rear surface of the tubular member 5 and/or the inner side surface in the left and right direction of the tubular member 5 is used as the supporting surface 6 and that the front surface of the tubular member 5 and/or the outer side surface

in the left and right direction of the tubular member 5 is used as the non-supporting surface 7. Further, it is preferable that the cut part 8 is formed in the front surface or the outer side surface in the left and right direction of the tubular member 5.

Further in the tubular member 5 of the present embodiment, although the configuration of forming the cut part 8 in the rear surface is exemplified and described, the cut part 8 may be a non-formed tubular member 5 in the case where the lower limb can be inserted.

[0052]

Further, although the rotating roller 14 is used as the massaging member in the present embodiment, a projection stood from the bottom part 2c of the case body 2 may be used.

That is, the present invention should not be limited in particular so long as the lower limb massaging machine 1 supporting a surface of a partial portion of the tubular member 5 with the case body 2 is used.

Further, by providing the lower limb massaging machine 1 according to the present invention in the forward of a seat part of a chair typed massaging machine, it is also possible to be commonly and usably provided as a footrest.

Reference Signs List

[0053]

1 … Lower limb massaging machine

2 … Case body (casing)

2a … Front cover

2b … Rear cover

2c … Bottom part

3 … Insertion concave part

4 … R surface

5 … Tubular member (treating part)

5a … Horizontal tubular member

5b … Vertical tubular member

6 … Supporting surface

7 … Non-supporting surface

8 … Cut part

9 … Engagement member (zipper)

10a … First air bag

10b … Second air bag

10c … Third air bag

11 … Air supply hose

12 … Pump (compressor)

13 … Solenoid valve

14 … Massaging member (rotating roller)

15a … First projection part

15b … Second projection part

16 … Rotating shaft

17 … Supporting member

18 … Bearing

19 … Electric motor

20 … Gear box

21 … Control device

22 … Driving operation switch

23 … Handle

24 … Power switch

25 … Power code

26 … Massaging member (plate material)

27a … First projection

27b … Second projection

L … Lower limb

C … Calf

H … Heel

F … Instep

CLAIMS

1. A lower limb massaging machine comprising:

a pair of tubular members formed in L-character shapes in a side view into which lower limbs of a user can be inserted from opened upper parts; an air bag provided on each of said tubular members and performing pressure massage to said inserted lower limb; and a pump supplying air to said air bag, wherein

said tubular members are supported side by side in the left and right inside a case body, and

at least one surface of a front surface, side surfaces in the left and right direction and a rear surface of each of said tubular members is served as a supporting surface supported by the case body.

2. The lower limb massaging machine according to claim 1, wherein, in a non-supporting surface different from said supporting surface, there is formed a cut portion along an insertion direction of each of the lower limbs.

3. The lower limb massaging machine according to claim 2, wherein said front surface of said tubular member and/or inner side surface in the left and right direction

of said tubular member is served as said supporting surface and said rear surface of said tubular member and/or outer side surface in the left and right direction of said tubular member is served as said non-supporting surface, and

a line zipper or a surface zipper is used in said cut portion.

4. The lower limb massaging machine according to claim 1, wherein said pump is provided in the middle of said one pair of left and right tubular members.

5. The lower limb massaging machine according to claim 3, wherein said tubular members are formed in the L-character shapes in combination of a horizontal tubular member oriented in the horizontal direction and a vertical tubular member oriented in the vertical direction,

a first air bag is provided on an upper side surface of said horizontal tubular member,

a second air bag is provided on a lower side surface of said vertical tubular member, and

a third air bag is provided on an upper side surface of said vertical tubular member.

6. The lower limb massaging machine according to any one of claims 1 to 5, wherein, on a lower part of said tubular member, there is provided a massaging member performing a pressure massage to an inserted sole.

7. The lower limb massaging machine according to claim 6, wherein a rotary rotating roller is adopted to said massaging member.