

SPECIFICATION

Title of Invention

CHAIR-TYPE MESSAGE DEVICE AND CONTROL METHOD OF
CHAIR-TYPE MESSAGE DEVICE

Technical Field

[0001]

The present invention relates to a chair-type message device and a method for controlling the chair-type message device.

Background Art

[0002]

There is known a chair-type message device as shown in Patent Literature 1, wherein a message mechanism for causing a pair of right and left message members to perform a message motion is internally installed in a backrest. There has also been developed a chair-type message device as shown in Patent Literature 2, wherein a message mechanism such as airbags is disposed in side regions of a seat on which a user sits.

Citation List

Patent Literature

[0003]

Patent Literature 1: Japanese Unexamined Patent Publication JP-A
2009-297350

Patent Literature 2: Japanese Unexamined Patent Publication JP-A
2010-162071

Summary of Invention

Technical Problem

[0004]

In the chair-type massage devices of Patent Literatures 1 and 2, a pleasant massage treatment can be applied to a user by causing combinational motions of the above massage mechanism.

In such chair-type massage devices, there have been requests from users such as “a massage to intensively press acupuncture points”. However, a technique to achieve a massage without causing a feeling of discomfort such as “pain” while certainly pressing acupuncture points of a user has not been developed yet.

[0005]

The present invention was achieved in consideration of the above problems and aims at providing a chair-type massage device capable of implementing a pleasant “pressure point massage (local pressure massage)” and a method for controlling the chair-type massage device.

Solution to Problem

[0006]

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

Specifically, a chair-type massage device according to the present invention has a seat on which a user sits and a backrest provided at the rear of the seat, wherein a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, airbags for performing a pressure massage are provided in at least

one of an upper surface of the seat, side regions of the seat, and side regions of the backrest, and a control part is provided to cause a massage motion by cooperatively operating the massage bodies of the back region massage mechanism and inflation of the airbag.

[0007]

A chair-type massage device according to the present invention includes a seat on which a user sits, a backrest provided at the rear of the seat, and a footrest provided in front of the seat, wherein a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat, and side regions of the backrest, a leg kneading mechanism having kneading means for applying a massage to the lower legs of the user is provided in the footrest, and a control part is provided to cause a massage motion while cooperatively operating at least two of the massage bodies of the back region massage mechanism, inflation of the airbags, and the kneading means of the leg kneading mechanism.

[0008]

The control part is preferably configured to coordinate a motion to position the massage bodies to the affected area, a motion to make the massage bodies project toward the affected area, and a motion to inflate the airbags provided in at least one of the upper surface of the seat, the side regions of the seat and the side regions of the backrest, by operating the back region massage mechanism.

The back region massage mechanism preferably has a massage

mechanism including a pair of massage members containing treatment elements and disposed on right and left sides and an actuator for transmitting the massage motion to the massage members, a base member for holding the massage mechanism swingably in a back-and-forth direction by supporting the massage mechanism in a swing pivotal support part, a vertical movement mechanism for making the base member movable in a vertical direction within the backrest, an advancing/retracting motion mechanism for advancing/retracting the massage mechanism with respect to the base member in the back-and-forth direction, and a swing restricting mechanism for making the massage members sustainable in a forward projection state in bringing the massage members to project forward by the advancing/retracting motion mechanism.

[0009]

It is preferable that each of the massage members has treatment elements in an upper end portion and a lower end portion thereof and the swing restricting mechanism is configured to make the massage members sustainable in a forward projection state on the upper end portion side in bringing the upper end portions of the massage members to project forward by the advancing/retracting motion mechanism and to make the massage members sustainable in a forward projection state on the lower end portion side in bringing the lower end portions of the massage members to project forward by the advancing/retracting motion mechanism.

[0010]

A method for controlling a chair-type massage device according to the present invention includes a seat on which a user sits and a backrest provided

at the rear of the seat, wherein a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, and airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat and side regions of the backrest, and wherein a massage motion is caused by cooperatively operating the massage bodies of the back region massage mechanism and inflation of the airbags.

[0011]

A method for controlling a chair-type massage device according to the present invention includes a seat on which a user sits, a backrest provided at the rear of the seat, and a footrest provided in front of the seat, wherein a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat and side regions of the backrest, and a leg kneading mechanism having kneading means adopted to apply a massage to the lower legs of the user is provided in the footrest, and wherein a massage motion is caused by cooperatively operating at least two of the massage bodies of the back region massage mechanism, inflation of the airbags, and the kneading means of the leg kneading mechanism.

[0012]

It is preferable to coordinate a motion to position the massage bodies to the affected area, a motion to make the massage bodies project toward the affected area, and a motion to inflate the airbags provided in at least one of the upper surface of the seat, the side regions of the seat, and the side regions

of the backrest, by operating the back region massage mechanism.

Advantageous Effects of Invention

[0013]

According to the technique of the chair-type massage device according to the present invention, it is possible to implement a pleasant pressure point massage (local pressure massage) for a user.

Brief Description of Drawings

[0014]

[Fig. 1] Fig. 1 is a perspective view of a chair-type massage device according to the present invention.

[Fig. 2] Fig. 2 is a diagram to explain a method for controlling the chair-type massage device.

[Fig. 3] Fig. 3 is a diagram to explain the method for controlling the chair-type massage device.

[Fig. 4] Fig. 4 is a perspective view of a back kneading mechanism provided in the chair-type massage device according to the present invention.

[Fig. 5] Fig. 5 is a side view showing the back kneading mechanism provided in the chair-type massage device according to the present invention (in which kneading balls are positioned uppermost).

[Fig. 6] Fig. 6 is a side view showing the back kneading mechanism provided in the chair-type massage device according to the present invention (in which kneading balls are positioned lowermost).

[Fig. 7] Fig. 7 shows guide rail parts of the back kneading mechanism provided in the chair-type massage device according to the present invention.

Description of Embodiments

[0015]

The following describes embodiments of the present invention with reference to the drawings.

Fig. 1 shows an example of a chair-type massage device 102 according to the present invention.

The chair-type massage device 102 shown in Fig. 1 has a seat 103 on which a user sits, a backrest 104 provided at the rear of the seat 103, and a footrest 105 provided in front of the seat 103.

[0016]

A leg body 106 for installing the chair-type massage device 102 on a floor surface is provided beneath the seat 103 so that the seat 103 is supported at a prescribed height by the leg body 106.

It is noted that, in the following description, a back-and-forth direction and a right-and-left direction in the chair-type massage device 102 are based on arrow marks showing back-and-forth and right-and-left directions shown in Fig. 1. These directions correspond to those viewed by the user sitting on the chair-type massage device 102.

[0017]

The backrest 104 is held in the state of being swingable back and forth with its lower end portion pivoted with respect to the rear portion of the seat 103. This backrest 104 is capable of reclining relative to the seat 103 by a reclining mechanism composed of a linear actuator arranged within the leg body 106.

There is also provided a back region massage mechanism 114 for performing a massage motion such as kneading and patting within the backrest 104.

[0018]

The back region massage mechanism 114, whose detailed structure will be described later, has a pair of right and left massage members 17 and each of the massage members 17 has a support arm 20 of a boomerang shape with tip end portions projecting diagonally forward in upward and downward directions, and massage bodies 21 (treatment elements) provided in both upper and lower end portions of each of the support arms 20. The right and left massage members 17 perform a kneading massage by motions to approach and separate from each other and also perform a patting massage motion by vibratory advancing and retracting motions.

[0019]

When the massage members 17 perform a massage on a region such as user's hip, lower massage bodies 21b project forward and upper massage bodies 21a retract backward. At this time, the lower massage bodies 21b press an affected area of the user.

When the massage members 17 perform a massage on a region such as user's shoulders, the upper massage bodies 21a project forward and the lower massage bodies 21b retract backward. At this time, the upper massage bodies 21a press the affected area of the user.

[0020]

These advancing and retracting motions of the massage bodies 21 in the back-and-forth direction (direction to approach and separate from the

user) are caused by an advancing/retracting motion mechanism 14 and a swing restricting mechanism 15 to be described later.

The seat 102 has a wide area enough to support user's hips from beneath. Two of airbags A and B are disposed in an upper surface of the seat 102 in the right-and-left direction so as to constitute a seat region massage mechanism 112. Air is supplied to the airbags A and B that are therefore inflated to apply a pressure massage pressing the seat of the user from beneath.

[0021]

The airbag A is disposed in a left side portion of the seat 102 to apply a pressure massage to a region from the left leg to the left hip of the user, while the airbag B is disposed in a right side portion of the seat 102 to apply a pressure massage to a region from the right leg to the right hip of the user.

Side region kneading mechanisms 107 are provided on both sides of the backrest 104.

The side region kneading mechanisms 107 have airbags C and D provided on left and right sides of the backrest 104 respectively. It is configured to inflate and deflate these airbags C and D repetitively at a prescribed rhythm in order to press and massage the side of the upper arms and the side of the shoulders of the user who leans against the backrest 104 from right and left sides.

[0022]

Specifically, the airbag C is provided on the left side of the backrest 104. A pressure massage pressing a region from the side of the left shoulder to the side of the upper left arm of the user is applied by supplying air to

inflate the airbag C. The airbag D is provided on the right side of the backrest 104. A pressure massage pressing a region from the side of the right shoulder to the side of the upper right arm of the user is applied by supplying air to inflate the airbag D.

[0023]

The footrest 105 can support the lower legs (the right and left legs from the calves to the feet) of the user who sits on the seat 103. The footrest 105 can be moved by a footrest moving mechanism disposed within the leg body 106 to a position selected from a storage position in which the footrest 105 is stored beneath the seat 103, a use position (first use position, Fig. 1 shows the state in the first use position) in which the footrest 105 projects forward from the seat 103 so as to connect a floor surface F in front of the seat 103 and the upper surface of the seat 103 in an inclined position to fall forward, and a use position (second use position) in which the footrest 105 floats from the inclined position to an area above the floor surface F to be thrown into a substantially horizontal posture at the same height as the seat 103.

[0024]

The footrest 5 is formed with a pair of right and left holding grooves 110, 110 in which the lower legs of the user can be fitted one by one in a front surface of the footrest 5 when the footrest 5 is suspended in the first use position or the second use position or between the first and second use positions. A leg kneading mechanism 115 is built in inner opposing surfaces of these right and left holding grooves.

The leg kneading mechanism 115 has kneading means. In the case of

the present embodiment, the kneading means refers to a pair of right and left kneading plates 111, 111 and the pair of right and left kneading plates 111, 111 approach and separate from each other repetitively to press and massage user's lower legs fitted into the kneading plates 111, 111 from right and left sides. Note that, as the kneading means, airbags may also be adopted in place of the kneading plates 111, 111.

[0025]

Furthermore, armrests 108 are provided on both right and left sides of the seat 103.

In each of mutually opposing inner surfaces (right side surface of the left armrest 108 and left side surface of the right armrest 108) of the armrests 108, a thigh/hip massage mechanism 113 is provided. There is also an arm massage mechanism provided within each of the armrests 108.

The thigh/hip massage mechanism 113 is configured to massage the thighs and hips of the user who sits on the seat 3 by inflating and deflating airbags E and F repetitively at a prescribed rhythm. Specifically, the airbag E is disposed in the right side of the left armrest 108 to apply a pressure massage to a region from the left thigh to the left hip of the user and the airbag F is disposed in the left side of the right armrest 108 to apply a pressure massage a region from to the right thigh to the right hip of the user.

[0026]

Thus, the chair-type massage device 102 has a plurality of massage parts (the back region massage mechanism 114, the seat region massage mechanism 112, the side region kneading mechanism 107, the thigh/hip massage mechanism 113, and the leg kneading mechanism 115) for massaging

various kinds of treatment regions.

The chair-type massage device 102 as stated above can, in the case of the present embodiment, perform a massage (local pressure massage) to intensively press acupuncture points.

The local pressure massage is performed by cooperatively operating the back region massage mechanism 114, the leg kneading mechanism 115 (the pair of right and left kneading plates 111, 111), and other massage mechanisms (airbags A to F).

[0027]

Explained below, with reference to Fig. 2 and Fig. 3, will be massage motions in which the back region massage mechanism 114, the pair of right and left kneading plates 111 and the airbags A to F cooperate with each other, that is, a [first cooperative massage] to an [eighth cooperative massage].

These massage motions are controlled and caused by a control part built in the chair-type massage device 102.

[First cooperative massage]

In the first cooperative massage, firstly, the massage members 17 are moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupressure is applied. Then, the massage bodies 21 are made to project forward and pressed against the user by the advancing/retracting motion mechanism 14. Fig. 2 and Fig. 3 show the state where the massage bodies 21 project forward in shoulder positions. Then, air is supplied to inflate either the airbag A or the airbag B or both the airbag A and the airbag B provided in the seat 102.

[0028]

Owing to inflation of the airbag A and/or the airbag B, the user is lifted upward and the massage bodies 21 are in the state (pressure point state) of pressing an affected area locally.

Even if the massage bodies 21 are pressed against the affected area of the user by an excessive force, the airbags A and B can be recessed downward and therefore the user seldom feels “pain” in the pressure point state, whereby a pleasant local pressure massage can be performed.

[0029]

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by moving the massage members 17 vertically. There is also no problem to set the timing of operating the massage bodies 21 and the timing of inflating the airbags A and B in the opposite order.

[Second cooperative massage]

In the second cooperative massage, the massage members 17 are moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupressure is applied. Then, the massage bodies 21 are made to project forward and pressed against the user by the advancing/retracting motion mechanism 14. Fig. 2 and Fig. 3 show the state where the massage bodies 21 project forward

in shoulder positions. Then, air is supplied to inflate either the airbag A or the airbag B or both the airbag A and the airbag B provided in the seat 102.

[0030]

Then, after a while, air is supplied to inflate either the airbag C or the airbag D or both the airbag C and the airbag D of the side region kneading mechanism 107.

Owing to inflation of the airbag A and/or the airbag B, the user is lifted upward and the massage bodies 21 are in the state (pressure point state) of pressing the affected area locally. Even if the massage bodies 21 are pressed against the affected area of the user by an excessive force, the airbags A and B can be recessed downward to a certain extent and therefore the user seldom feels “pain” in the pressure point state, whereby a pleasant local pressure massage can be performed. It is also possible to prevent user’s body from escaping rightward and leftward because air is supplied to inflate the airbag C and/or the airbag D, while a more effective (stronger) local pressure massage can be performed.

[0031]

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by moving the massage members 17 vertically. The timing of inflating the airbags A and B provided in the seat 102 may also be set before or after the

timing of inflating the airbags C and D of the side region kneading mechanism 107 or these timings may also be set to be the same. There is also no problem to set the timing of operating the massage bodies 21 and the timing of inflating the airbags A to D in the opposite order.

[Third cooperative massage]

In the third cooperative massage, firstly, the massage members 17 are moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupuncture is applied. Then, the massage bodies 21 are made to project forward and pressed against the user by the advancing/retracting motion mechanism 14. Fig. 2 and Fig. 3 show the state where the massage bodies 21 project forward in shoulder positions. Then, air is supplied to inflate either the airbag A or the airbag B or both the airbag A and the airbag B provided in the seat 102.

[0032]

Then, after a while, air is supplied to inflate either the airbag E or the airbag F or both the airbag E and the airbag F of the thigh/hip massage mechanism 113.

Owing to inflation of the airbag A and/or the airbag B, the user is lifted upward and the massage bodies 21 are in the state (pressure point state) of pressing the affected area locally. Even if the massage bodies 21 are pressed against the affected area of the user by an excessive force, the airbags A and B can be recessed downward to a certain extent and therefore the user seldom feels “pain” in the pressure point state, whereby a pleasant local pressure massage can be performed. It is also possible to prevent user’s body from escaping rightward and leftward because air is supplied to inflate

the airbags E and/or F, while a more effective (stronger) local pressure massage can be performed.

[0033]

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by moving the massage members 17 vertically. The timing of inflating the airbags A and B provided in the seat 102 may also be set before or after the timing of inflating the airbags E and F of the side region kneading mechanisms 107 or these timings may also be set to be the same. There is also no problem to set the timing of operating the massage bodies 21 and the timing of inflating the airbags A, B, E, and F in the opposite order.

[Fourth cooperative massage]

In the fourth cooperative massage, firstly, the massage members 17 are moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupuncture is applied. Then, the massage bodies 21 are made to project forward and pressed against the user by the advancing/retracting motion mechanism 14. Fig. 2 and Fig. 3 show the state where the massage bodies 21 project forward in shoulder positions. Then, air is supplied to inflate either the airbag A or the airbag B or both the airbag A and the airbag B provided in the seat 102.

[0034]

Then, after a while, air is supplied to inflate either the airbag C or the airbag D or both the airbag C and the airbag D of the side region kneading mechanism 107. Thereafter, air is further supplied to inflate either the airbag E or the airbag F or both the airbag E and the airbag F of the thigh/hip massage mechanism 113.

Owing to inflation of the airbag A and/or the airbag B, the user is lifted upward and the massage bodies 21 are in the state (pressure point state) of pressing the affected area. Even if the massage bodies 21 are pressed against the affected area of the user by an excessive force, the airbags A and B can be recessed downward to a certain extent and therefore the user seldom feels “pain” in the pressure point state, whereby a pleasant local pressure massage can be performed. It is also possible to prevent user’s body from escaping rightward and leftward because air is supplied to inflate at least one of the four airbags C to F positioned in side of the user, while a more effective (stronger) local pressure massage can be performed.

[0035]

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by moving the massage members 17 vertically. The timing of inflating the airbags A and B provided in the seat 102, the timing of inflating the airbags C and D of the side region kneading mechanism 107, and the timing of inflating

the airbags E and F of the thigh/hip massage mechanism 113 may also be set in any order or all these timings may be set to be the same (simultaneous inflation). There is also no problem to set the timing of operating the massage bodies 21 and the timing of inflating the airbags A to F in the opposite order.

[Fifth cooperative massage]

In the fifth cooperative massage, firstly, the massage members 17 are moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupuncture is applied. Then, air is supplied to inflate both the airbags C and D of the side region kneading mechanism 107 to obtain a circumstance in which user's body can be prevented from deviating (escaping) rightward and leftward. Thereafter, the massage bodies 21 are made to project forward sequentially and pressed against the user locally by the advancing/retracting motion mechanism 14.

[0036]

Owing to the forward projecting motion of the massage bodies 21, the massage bodies 21 are in the state (pressure point state) of pressing the affected area.

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by

moving the massage members 17 vertically. There is also no problem to set the timing of operating the massage bodies 21 and the timing of inflating the airbags C and D in the opposite order.

[Sixth cooperative massage]

In the sixth cooperative massage, firstly, the user sits on the seat 103, after which the footrest 5 is set to the first use position (position to be pushed out forward) and the lower legs of the user are inserted into the pair of right and left holding grooves 110, 110.

[0037]

Then, the leg kneading mechanism 115 is operated to tuck the lower legs in the pair of right and left kneading plates 111. The reclining mechanism disposed within the leg body 106 is further operated to bring down the backrest 104 backward. Note that the holding motion by the pair of right and left kneading plates 111 may be performed before or after the reclining motion of the backrest 104 or these motions may also be performed simultaneously.

[0038]

Thereafter, the massage members 17 are further moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupressure is applied. Then, the massage bodies 21 are made to project forward sequentially and pressed against the user by the advancing/retracting motion mechanism 14. Therefore, an effective pressure point massage can be implemented.

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in

the case where the massage bodies 21 project at a position in the neck region, the back region or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by moving the massage members 17 vertically. Although explanation was made above in the state where the footrest 5 is set to the first use position, the footrest 5 may also be set to the second use position (forward floating position).

[Seventh cooperative massage]

In the seventh cooperative massage, firstly, the user sits on the seat 103, after which the footrest 5 is set to the first use position (position to be pushed out forward) and the lower legs of the user are inserted into the pair of right and left holding grooves 110, 110.

[0039]

Then, the leg kneading mechanism 115 is operated to tuck the lower legs in the pair of right and left kneading plates 111. The reclining mechanism disposed within the leg body 106 is further operated to bring down the backrest 104 backward. The holding motion by the pair of right and left kneading plates 111 may be performed before or after the reclining motion of the backrest 104 or these motions may also be performed simultaneously.

[0040]

Then, air is supplied to inflate either the airbag A or the airbag B or both the airbag A and the airbag B provided in the seat 102. Owing to inflation of the airbag A and/or the airbag B, the user is lifted upward to a certain extent.

Thereafter, the massage members 17 are further moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupressure is applied. Then, the massage bodies 21 are made to project forward and pressed against the user by the advancing/retracting motion mechanism 14. Therefore, an effective pressure point massage can be implemented.

[0041]

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by moving the massage members 17 vertically. The timing of operating the massage bodies 21 and the timing of inflating the airbags A and B may also be set in the opposite order or these timings may be set to be the same. Although explanation was made above in the state where the footrest 5 is set to the first use position, the footrest 5 may also be set to the second use position (forward floating position).

[Eighth cooperative massage]

In the eighth cooperative massage, firstly, the user sits on the seat 103, after which the footrest 5 is set to the first use position (position to be pushed out forward) and the lower legs of the user are inserted into the pair of right and left holding grooves 110, 110.

[0042]

Then, the leg kneading mechanism 115 is operated to tuck the lower legs in the pair of right and left kneading plates 111. The reclining mechanism disposed within the leg body 106 is further operated to bring down the backrest 104 backward. Note that the holding motion by the pair of right and left kneading plates 111 may be performed before or after the reclining motion of the backrest 104 or these motions may also be performed simultaneously.

[0043]

Then, air is supplied to inflate both the airbag C and/or the airbag D of the side region kneading mechanism 107.

Thereafter (or at the same time as inflating the airbags C and D), the massage members 17 are moved vertically by operating the back region massage mechanism 114, after which the massage bodies 21 are placed in a position in which an acupuncture pressure is applied. Then, the massage bodies 21 are made to project forward and pressed against the user by the advancing/retracting motion mechanism 14. Therefore, it is possible to prevent user's body from escaping rightward and leftward, while a more effective (stronger) local pressure massage can be performed.

[0044]

By the way, the position at which the massage bodies 21 project forward is not limited to the shoulder region. There is no problem arising in the case where the massage bodies 21 project at a position in the neck region, the back region, or the hip region. Contrarily to the above explanation, the massage bodies 21 may also be made to project forward and pressed against the user by the advancing/retracting motion mechanism 14, followed by

moving the massage members 17 vertically. The timing of operating the massage bodies 21 and the timing of inflating the airbags C and D may also be set in the opposite order or these timings may also be set to be the same. Although explanation was made above in the state where the footrest 5 is set to the first use position, the footrest 5 may also be set to the second use position (forward floating position).

[0045]

As stated above, it is possible to perform an effective pressure point massage without giving a feeling of discomfort to the user by implementing the [first cooperative massage] to the [eighth cooperative massage] with the use of the control part of the chair-type massage device 102.

By the way, in implementation of the above first cooperative massage to the eighth cooperative massage, the structure of the back region massage mechanism 114 is not limited. Any structures may be adopted as long as the lower massage bodies 21b of the massage members 17 can project forward and the upper massage bodies 21a thereof can project forward. A preferable structure is such that the massage bodies 21 can be positioned and fixed temporarily so as not to retract due to a reaction force applied from the user when the massage bodies 21 project forward.

[0046]

In the case of the present embodiment, the back region massage mechanism 114 which satisfies the above conditions and is specific to the present invention is adopted.

Details of the back region massage mechanism 114 will be explained below.

Fig. 4 shows the back region massage mechanism 114 adopted in the present embodiment.

The back region massage mechanism 114 is provided with a massage mechanism 10, a base member 12 for supporting a lower end portion of the massage mechanism 10 via a swing pivotal support part 11, and a vertical movement mechanism 13 to enable movement of the base member 12 in the vertical direction within the backrest 3. The back region massage mechanism 114 further has the advancing/retracting motion mechanism 14 for moving an upper end portion of the massage mechanism 10 back and forth relative to the base member 12 so as to change a longitudinal inclination angle of the massage mechanism 10, and the swing restricting mechanism 15 for restricting rotation and swing of the massage members 17 provided in the massage mechanism 10.

[0047]

The massage mechanism 10 has the pair of right and left massage members 17 and an actuator 18 for causing these right and left massage members 17 to perform a massage motion as appropriate.

The massage members 17 has the support arms 20 of a boomerang shape with tip end portions projecting diagonally forward in upward and downward directions, and the massage bodies 21 (treatment elements) provided in both upper and lower end portions of the support arms 20. Each of the massage bodies 21 can be formed into a thick disk shape or spherical shape by, for example, resin and hard rubber or the like. Note that, in the following description, each of the massage bodies 21 on the upper end side is called the “upper massage body 21a” and each of the massage bodies 21 on the

lower end side is called the “lower massage body 21b” as needed.

[0048]

The actuator 18 has a kneading actuator 23 for causing the right and left massage members 17 to perform a motion of approaching and separating from each other, and a patting actuator 24 for causing the right and left massage members 17 to perform a patting motion alternately.

The kneading actuator 23 has inclined rotary members 25 embedded in central bent portions of the support arms 20 of the massage members 17, a first rotary shaft 26 whose shaft center is laid and directed to the right-and-left direction so as to penetrate through the inclined rotary members 25, a kneading motor for driving the first rotary shaft 26 to rotate, and clamper mechanisms 28 provided at the rear of the central bent portions in the support arms 20 in order to restrict rotation of the support arms 20 along with the first rotary shaft 26. For the clamper mechanisms 28, it is possible to adopt universal couplings such as, ball joints and universal joints.

[0049]

The inclined rotary members 25 are rotatably engaged with and held in, via bearings or the like, circumferences of mounting bosses that are concentrically provided in the first rotary shaft 26 by being inclined in an integrally rotatable manner. Accordingly, when the kneading motor is driven to rotate the first rotary shaft 26, the inclined rotary members 25 generate fluctuating rotational deflection around a rotation center of the first rotary shaft 26 as an axis and the rotational deflection is transmitted to the massage bodies 21 via the support arms 20.

[0050]

The support arms 20 are held by the clasper mechanisms 28 in the state without rotating with the first rotary shaft 26 but allowed to be in motion within a prescribed range along the back-and-forth direction, the right-and-left direction, and the vertical direction. A direction to which the inclined rotary members 25 are inclined between the right and left support arms 20 is also held with a phase difference of 180 degrees around the first rotary shaft 26.

Owing to such a configuration, the right and left support arms 20 operate in the kneading actuator 23 such that the upper massage bodies 21a approach and separate from each other repetitively in the right-and-left direction and the lower massage bodies 21b separate from and approach each other repetitively in the right-and-left direction. The lower massage bodies 21b separate from each other when the upper massage bodies 21a approach each other, and the lower massage bodies 21b approach each other when the upper massage bodies 21a separate from each other, whereby generating a kneading motion as the massage members 17.

[0051]

Meanwhile, the patting actuator 24 has a second rotary shaft 31 provided in a position above the first rotary shaft 26 of the inclined rotary members 25 by with a shaft center thereof directed to the right-and-left direction so as to be in parallel with the first rotary shaft 26, a patting motor 32 for driving the second rotary shaft 31 to rotate, right and left eccentric actuator bodies 34 provided eccentric to right and left end portions of the second rotary shaft 31 with a phase difference of 180 degrees, and link levers

36 (long crankshafts) provided to project downward with respect to housings 35 that rotatably hold the right and left eccentric actuator bodies 34.

[0052]

Each of the eccentric actuator bodies 34 is equipped with an eccentric collar on an inner ring side or an outer ring side of a bearing so that a shaft center of the second rotary shaft 31 is inconsistent with that of the housings 35. Lower end portions of the link levers 36 are also coupled to the central bent portions of the support arms 20 belonging to the massage member 17 and these coupling portions are used to form the aforementioned clamber mechanism 28 (such as ball joints). Specifically, the clamber mechanisms 28 are provided in lower end portions of the link levers 36 that are coupled to proximal edge portions of the support arms 20 via the clamber mechanisms 28.

[0053]

Accordingly, in the patting actuator 24, the eccentric actuator bodies 34 rotate eccentrically with respect to the shaft center of the second rotary shaft 31 by driving the patting motor 32, which prompts the housings 35 to move circumferentially. As a result, a pushing/pulling motion in the vertical direction is transmitted from the housings 35 to the link levers 36 (long crankshafts). Therefore, the right and left support arms 20 swing the massage bodies 21 thereof around the first rotary shaft 26 and move the upper massage bodies 21a and the lower massage bodies 21b to mutually opposite directions in the back-and-forth direction, whereby generating a patting motion as the massage members 17.

[0054]

Note that the swing is generated alternately in the right and left

support arms 20 because the right and left eccentric actuator bodies 34 are provided with a phase difference of 180 degrees.

Specifically, the right support arm 20 moves the upper massage body 21a backward when the left support arm 20 moves the upper massage body 21a forward. In contrast, the right support arm 20 moves the lower massage body 21b backward when the left support arm 20 moves the lower massage body 21b forward.

[0055]

Note that, as shown in Fig. 4, a motor support base 37 for the patting motor 32, which is configured to incorporate a reduction gear, is provided in a portion to transmit rotary drive from the patting motor 32 to the second rotary shaft 31. Two of guide bars 38 directed so as to set its longitudinal direction vertically penetrate through the motor support base 37 like skewering in a parallel state with a prescribed interval to each other.

These guide bars 38 are laid within a guide frame 40 of a concave shape to be seen from the side and the guide frame 40 is fixed by being supported by (based on) a gear head 39, which is provided for the kneading motor of the kneading actuator 23 to transmit rotary drive to the first rotary shaft 26 and incorporates a reduction gear, in the state of extending above the gear head 39.

[0056]

Specifically, the patting motor 32 is held in the state of being movable in the vertical direction (direction approaching and separating from the kneading motor) along the guide bars 38 and herein the guide bars 38 and the guide frame 40 constitute a vertical guide support part 41 for holding the

patting actuator 24 in a vertically movable manner.

Owing to the arrangement of such a vertical guide support part 41, the following motion can be performed. Specifically, in principle, the massage members 17 are restricted from rotating with the first rotary shaft 26 by the clamper mechanisms 28 when the kneading motor causes the first rotary shaft 26 to rotate as well as when the patting motor 32 causes the second rotary shaft 31 to rotate.

[0057]

However, in the case where a load of the user who leans against the massage members 17 is applied thereon, the patting motor 32 moves vertically along with components that are in a conjunctive relation therewith including the clamper mechanisms 28, the link levers 36, the second rotary shaft 31, and the motor support base 37. Therefore, the massage members 17 move by being allowed to rotate and swing about the first rotary shaft 26 as a center in a prescribed range.

[0058]

The massage mechanism 10 including the above configuration is supported in a lower end portion thereof by the base member 12 via the swing pivotal support part 11. The swing pivotal support part 11 has a pivot 42 whose shaft center is directed to the right-and-left direction and the massage mechanism 10 is held with the pivot 42 as a fulcrum so that an upper end side thereof can swing in the back-and-forth direction relative to the base member 12.

In addition, a hinge piece part projecting downward is provided in the gear head 39 of the kneading motor and a hinge base part which projects

forward from a lower end portion of the base member 12 so as to hold the hinge piece part from both right and left sides is provided. The pivot 42 is provided in the state of penetrating through the hinge piece part and the hinge base part in the right-and-left direction.

[0059]

The vertical movement mechanism 13 vertically moves the massage mechanism 10 with the base member 12 as a whole, wherein guide rollers are provided above and below the base member 12 on both right and left sides thereof with a rotary shaft center thereof directed to the right-and-left direction, and these guide rollers are guided in a vertically movable manner along a pair of right and left guide rails each of which is embedded so as to set its longitudinal direction vertically.

[0060]

Then, as shown in Fig. 5 and Fig. 6, a screw shaft 48 which can be driven to rotate by a lifting motor 47 is provided in a space between both of the guide rails and a nut member screwed onto the screw shaft 48 is built in the base member 12. Accordingly, owing to the screw shaft 48 which is driven to rotate by activation of the lifting motor 47, the massage mechanism 10 moves vertically along with the base member 12 within the backrest 3.

[0061]

Therefore, the user who sits on the seat 2 and presses his back against the backrest 3 can receive a massage in a wide range extending from the shoulder region to the back and hip regions.

Next, with the use of Fig. 4, the “advancing/retracting motion mechanism 14” and the “swing restricting mechanism 15” serving as unique

mechanisms provided in the chair-type massage device 1 according to the present invention will be explained.

The advancing/retracting motion mechanism 14 has a slider 50 provided in a vertically movable manner relative to the base member 12, a slide mechanism for vertically moving the slider 50, transmission arms 52 for coupling the slider 50 and the massage mechanism 10, rail parts 53 provided in the base member 12, and sliding members 54 provided to project from the massage mechanism 10 toward the rail parts 53.

[0062]

The slider 50 is arranged in a front surface of the base member 12 and formed as a columnar block extending in the right-and-left direction. A guide bar laid between an upper bracket which is provided to project forward from an upper front surface of the base member 12 and a lower bracket which is provided to project forward from a lower front surface of the base member 12 penetrates through the slider 50 like skewering, whereby enabling vertical movement of the slider 50 relative to the base member 12.

[0063]

In contrast, the slide mechanism has a feed screw shaft which is rotatably laid between the upper bracket and the lower bracket in parallel with a guide bar for the slider 50 and an electric motor 64 for driving the feed screw shaft to rotate. The feed screw shaft penetrates through the slider 50 in the vertical direction and the slider 50 is provided with a female screw part which is screwed onto the feed screw shaft. The screw structure made of the female screw part and the feed screw shaft is formed by a square thread or preferably a trapezoidal thread, each of which is excellent in the screw thrust

force and backlash resistance.

[0064]

The rail parts 53 are provided in opposing inner surfaces of side plate parts 66 projecting forward from right and left side portions of the base member 12. In the present first embodiment, the rail parts 53 each of which is recessed in the side plate part 66 as a groove are shown. The rail parts 53 are formed to have an arc-shaped curve of an upward bulging shape with the swing pivotal support part 11, in which the base member 12 swingably supports the lower end portion of the massage mechanism 10, as a center.

[0065]

The sliding members 54 are formed by rotatable rollers that are swingably engaged with (fitted in) the rail parts 53 (grooves) in the slidable state. Accordingly, when an external force is added to the massage mechanism 10 to cause a swing about the swing pivotal support part 11 as a center, the sliding members 54 perform circular arc movement along the rail parts 53 to stabilize the swing of the massage mechanism 10.

[0066]

The transmission arms 52 are provided as a pair (two arms) on the right and left sides and arranged so as to be distributed to the right and left sides of the massage mechanism 10 and the slider 50. In each of the transmission arms 52, a portion coupled to the massage mechanism 10 is provided with a first pivot shaft whose shaft center is directed to the right-and-left direction, and a link joint part which can swing about the first pivot shaft as a center is formed. The link joint parts are arranged in upper

end portions of the massage mechanism 10.

[0067]

Note that positions (rotational center of the roller) in which the sliding members 54 are provided with respect to the massage mechanism 10 and the link joint parts to face the massage mechanism 10 in the transmission arms 52 are arranged uniaxially on the shaft center of the first pivot shaft belonging to the link joint parts. Therefore, a pushing/pulling force transmitted to the massage mechanism 10 via the transmission arms 52 is also transmitted to the sliding members 54 efficiently, which makes it easier, as a result, for the sliding members 54 to smoothly move along the rail parts 53.

[0068]

In portions coupled to the slider 50 in the transmission arms 52, a second pivot shaft whose shaft center is directed to the right-and-left direction is provided and link joint parts that can swing about the second pivot shaft as a center are formed.

In the advancing/retracting motion mechanism 14 including such a configuration, the feed screw shaft is driven to rotate by the electric motor 64 of the slide mechanism in order to generate an upward movement force or a downward movement force in the slider 50 via the female screw part which is screwed onto the feed screw shaft, whereby the slider 50 is allowed to move upward or downward along the guide bar of the slide mechanism.

[0069]

When the slider 50 moves upward, the transmission arms 52 push out the sliding members 54 forward along the rail parts 53 as shown in Fig. 5,

whereby the massage mechanism 10 swings so as to project forward with the swing pivotal support part 11 as a center. Accordingly, the right and left massage members 17 are pushed out forward. Fig. 5 shows the state where the massage mechanism 10 is moved to an upper end position (user's shoulder position) by the vertical movement mechanism 13 and suspended.

[0070]

By driving the electric motor 64 of the slide mechanism reversely to the above, the slider 50 moves downward via the female screw part which is screwed onto the feed screw shaft, as shown in Fig. 6. At this time, the transmission arms 52 pull the sliding members 54 backward along the rail parts 53, whereby the massage mechanism 10 swings so as to return to an original state (backward) with the swing pivotal support part 11 as a center. Accordingly, the right and left massage members 17 also return to the original state (backward). Fig. 6 shows the state where the massage mechanism 10 is present in a lower end position (user's hip position) by the vertical movement mechanism 13.

[0071]

Meanwhile, the swing restricting mechanism 15 operates while being added to and cooperative with (interlocked with) the advancing/retracting motion mechanism 14. The swing restricting mechanism 15 has a function to partially restrict rotation and swing of the massage members 17 about the first rotary shaft 26 as a center, which is allowed by the vertical guide support part 41, when the massage mechanism 10 is inclined forward or stands backward.

The swing restricting mechanism 15 is provided with first rotation restricting parts 80 for restricting rotation (rotation about the first rotary shaft

26) of the support arms 20 in a position in which the upper massage bodies 21a project to the foremost position and the lower massage bodies 21b retract to the rearmost position. The swing restricting mechanism 15 is also provided with second rotation restricting parts 81 for restricting rotation of the support arms 20 in a position in which the upper massage bodies 21a retract to the rearmost position and the lower massage bodies 21b project to the foremost position.

[0072]

The swing restricting mechanism 15 further has rotation allowing parts 82 for allowing rotation (rotation about the first rotary shaft 26) of the massage members 17 in the state where the massage members 17 (the support arms 20) are in other positions than those restricted by the first rotation restricting parts 80 and the second rotation restricting parts 81.

These first rotation restricting part 80, second rotation restricting part 81, and rotation allowing part 82 are configured to exhibit functions as the first rotation restricting part 80, second rotation restricting part 81, and rotation allowing part 82 when prescribed portions of guide rail parts 85 provided in the base member 12 correspond to the first rotation restricting part 80, second rotation restricting part 81, and rotation allowing part 82, and a sliding members 86 of a roller shape provided to project from the massage mechanism 10 to the guide rail parts 85 are positioned in the prescribed portions.

[0073]

In explanation of the above configuration in detail, the guide rail parts 85 are formed into an endless rail orbit in mutually opposing inner walls of

the side plate parts 66 (being the same as those in which the rail parts 53 of the advancing/retracting motion mechanism 14 are provided) projecting forward from the right and left side portions of the base member 12. In other words, in each of the inner walls of the side plate parts 66, a concave part (rhombic opening) having a rhombic opening shape to be seen from the right or left side is formed and an elected side wall of the rhombic opening serves as the guide rail part 85. Note that the aforementioned rail parts 53 of the advancing/retracting motion mechanism 14 are also formed in the side plate parts 66.

[0074]

Each of the guide rail parts 85 has a semicircular part L1 in which the sliding member 86 of a roller shape is fitted. A linear part L2 is formed to extend from an upper end of the semicircular part L1 in a diagonally upward direction so as to be connected to a linear part L3 which is inclined more gently than the linear part L2. At the tip end of the linear part L3 on a side opposing the semicircular part L1, a semicircular part L4 in which the sliding member 86 of a roller shape is fitted is formed. An upper end of the semicircular part L4 and the linear part L3 are connected smoothly with each other.

[0075]

A linear part L5 is formed to extend in a diagonal downward direction from a lower end of the semicircular part L4 so as to be connected to a linear part L6 which is inclined more gently than the linear part L5. Eventually, a tip end of the linear part L6 is connected smoothly to a lower end of the semicircular part L1 so that the guide rail part 85 of a loop shape is formed.

In such a guide rail part 85, for a connection point P3 between the linear part L2 and the linear part L3, a connection point between the linear part L3 and the upper end of the semicircular part L4, a connection point P4 between the linear part L5 and the linear part L6, and a connection point between the linear part L6 and the lower end of the semicircular part L1, a smooth curve is used for connection. Meanwhile, a connection point P2 between the upper end of the semicircular part L1 and the linear part L2 and a connection point P1 between the lower end of the semicircular part L4 and the linear part L5 are of a projecting shape (projecting point P1 and projecting point P2) and a curve having an extreme value is used for connection.

[0076]

Although the guide rail parts 85 were described as having the rhombic opening shape to be seen from the side, lines connecting the semicircular part L1 and the semicircular part L4 serve as major axes of the rhombic opening and each of the guide rail parts 85 is formed in the side plate part 66 so that the major axes are disposed in the back-and-forth direction. Specifically, the guide rail parts 85 are arranged in a radially inward direction to the rail parts 53 of the advancing/retracting motion mechanism 14 to be seen from the pivot 42 of the swing pivotal support part 11, wherein the major axes of the rhombic opening are directed obliquely along an arc with the swing pivotal support part 11 as a center.

[0077]

Minor axes (lines substantially vertical to the major axes) of each of the guide rail parts 85 corresponding to the rhombic opening are substantially half the length of the major axes. The minor axes are directed to a direction

along the guide bars 38 for movably supporting the patting motor 32 in the vertical direction (direction to approach and separate from the kneading motor). The length of each of the minor axes of the guide rail parts 85 is substantially the same as a range in which the patting motor 32 moves vertically.

Meanwhile, the sliding members 86 are formed of rotatable rollers projecting from right and left end portions of the second rotary shaft 31 to right and left outer sides coaxially with the shaft center of the second rotary shaft 31, and each of the sliding members 86 can roll on the right or left guide rail part 85 in the state of being fitted in the concave portions of the rhombic opening.

[0078]

In each of the guide rail parts 85 whose arrangement and opening shape are determined as stated above, a portion corresponding to the semicircular part L4 serves as the first rotation restricting part 80. The semicircular part L1 also serves as the second rotation restricting part 81. Each of the first rotation restricting part 80 and the second rotation restricting part 81 has an opening width to fit the sliding member 86 without having backlash.

Each of the guide rail parts 85 is gradually made wider within the concave portion in the vertical direction as approaching the intersection point P3 from the first rotation restricting part 80, and on the contrary, each of the guide rail parts 85 is gradually made narrower within the concave portion in the vertical direction as approaching the second rotation restricting part 81 from the intersection point P3. Therefore, these regions (a vertical region

between the linear part L3 and the linear part L5 and a vertical region between the linear part L2 and the linear part L6) are wider than the sliding members 86 in the vertical direction. Specifically, these regions serve as a space in which the sliding members 86 can move freely in the vertical direction and this space corresponds to the rotation allowing parts 82.

[0079]

Furthermore, in each of the guide rail parts 85 provided in the swing restricting mechanism 15, a first projection adjusting part 93 and a second projection adjusting part 92 are provided.

The swing restricting mechanism 15 has the first rotation restricting parts 80, the second rotation restricting parts 81, and the rotation allowing parts 82 for allowing rotation about the first rotary shaft 26 by the massage members 17, which is substantially the same as the first embodiment. A configuration of forming the guide rail parts 85 into an endless rail orbit in the mutually opposing inner walls of the side plate parts 66 projecting forward from the right and left side portions of the base member 12 is also substantially the same as the first embodiment, and each of the guide rail parts 85 includes formation of the first rotation restricting part 80, the first projection adjusting part 93, the second rotation restricting part 81, the second projection adjusting part 92, and the rotation allowing part 82 (corresponding to prescribed portions within the guide rail part 85).

[0080]

Firstly, each of the guide rail parts 85 has a semicircular part G1 in which the sliding member 86 of a roller shape is fitted in a lower rear portion thereof. A linear part G2 is formed to extend forward from an upper end of

the semicircular part G1 in a slightly diagonal and upward direction, and a linear part G3 is formed to extend from a front end of the linear part G2 at an inclined angle which is directed to a further diagonally upward direction so as to be further connected to a linear part G4 which is inclined more gently than the linear part G3.

[0081]

The linear part G4 extends forward exceeding a length required in one side of the rhombic shape, and at a front end thereof on a side opposing the semicircular part G1, a semicircular part G5 in which the sliding member 86 of a roller shape is fitted is formed. The linear part G4 is connected to an upper end of the semicircular part G5.

From a lower end of the semicircular part G5, a linear part G6 is formed to extend backward in parallel with a range in which the linear part G4 extends forward, and a linear part G7 is formed to extend from a rear end of the linear part G6 in a diagonally downward direction so as to be further connected to a linear part G8 which is inclined more gently than the linear part G7.

[0082]

The linear part G8 which has a length required in one side of the rhombic shape further extends backward in parallel with the linear part G2 and a rear end of the extended portion is connected to a lower end of the semicircular part G1, and the endless guide rail part 85 is formed by these components as a whole.

Since each of the sliding members 86 is fitted in the semicircular part G1 positioned backward, a portion arranged to correspond to a diameter of the

semicircular part G1, in which the linear part G2 runs parallel with the linear part G8, can be used as a passage for the sliding member 86 to move therebetween. Therefore, the semicircular part G1 on the rear side is formed as the second rotation restricting part 81 for abutting on the sliding members 86 to stop backward movement thereof, and a rear passage portion disposed between the second rotation restricting part 82 and the rhombic opening (portion between the linear parts G2 and G8) is also formed as the second projection adjusting part 92 for allowing the sliding member 86 to slide only in the back-and-forth direction in the state of fitting the sliding member 86 therein.

[0083]

Similar to this configuration, since each of the sliding members 86 is fitted in the semicircular part G5 positioned to the front, a portion arranged to correspond to a diameter of the semicircular part G5, in which the linear part G4 runs parallel with the linear part G6, can be used as a passage for the sliding member 86 to move therebetween. Therefore, the semicircular part G5 on the front side is formed as the first rotation restricting part 80 for abutting on the sliding member 86 to stop forward movement thereof, and a front passage portion disposed between the first rotation restricting part 80 and the rhombic opening (portion between the linear parts G4 and G6) is also formed as the first projection adjusting part 93 for allowing the sliding member 86 to slide only in the back-and-forth direction in the state of fitting the sliding member 86 therein.

[0084]

For each of a connection point between an upper end of the

semicircular part G1 and the linear part G2, a connection point between the linear part G4 and an upper end of the semicircular part G5, a connection point between a lower end of the semicircular part G5 and the linear part G6, and a connection point between the linear part G8 and a lower end of the semicircular part G1, a straight line or a smooth curve is used for connection.

Meanwhile, a connection point Q2 between the linear part G2 and the linear part G3 and a connection point Q1 between the linear part G6 and the linear part G7 are formed as convex cross parts having a convex shape, that is, projecting parts (projecting point Q1 and projecting point Q2) so as to hinder the sliding member 86 from crossing thereover.

[0085]

Although the guide rail parts 85 were described as having the rhombic opening shape to be seen from the side, lines connecting the second projection adjusting part 92 disposed nearer to the second rotation restricting part 81 (the semicircular part G1) and the first projection adjusting part 93 disposed nearer to the first rotation restricting part 80 (the semicircular part G5) serve as major axes and the guide rail parts 85 are formed in the side plate parts 66 such that the major axes are directed to the back-and-forth direction.

Note that, in implementation of “the first cooperative massage to the eighth cooperative massage” that are characteristic motions of the present invention, the back region massage mechanism 114 is not limited to the above configuration.

[0086]

For example, even though the massage mechanism 10 is exemplified as the four-ball configuration (the upper massage body 21a and the lower

massage body 21b are provided in each of the pair of right and left massage members 17), the massage mechanism 10 may also be configured to have two balls (the massage bodies 21 are provided in the pair of right and left massage members 17 one by one).

Also, for the advancing/retracting motion mechanism which advances/retracts the massage mechanism in the back-and-forth direction, a configuration in which the amount of forward projection of the massage bodies 21 is variable based on an operation by a controller may also be adopted. In this case, in implementation of “the first cooperative massage to the eighth cooperative massage”, the user can change the amount of projection of the massage bodies 2 so that a cooperative massages can be carried out with preferable pressure intensity. If it is desired, the massage bodies 2 can be set to the maximum projection amount and fixed to a position in which the pressures strength is adjusted to the strongest level.

[0087]

It is also possible to adopt the massage mechanism 10 which is configured to have energizing means acting on (a spring having effect on) the massage bodies 21, wherein the projection amount of the massage bodies 21 is variable depending on the energizing force and the energizing amount of the energizing means.

By the way, the embodiments disclosed here are exemplified ones in every viewpoint and should not be interpreted as limited ones. The scope of the present invention is not defined by the above description but defined by the scope of the claims and it is intended to include meanings of the equivalents of the scope of the claims and all of the modifications within a

range of the scope.

Reference Signs List

[0088]

- 10 ... Massage mechanism
- 11 ... Swing pivotal support part
- 12 ... Base member
- 13 ... Vertical movement mechanism
- 14 ... Advancing/retracting motion mechanism
- 15 ... Swing restricting mechanism
- 17 ... Massage member
- 18 ... Actuator
- 20 ... Support arm
- 21 ... Massage body
- 21a ... Upper massage body
- 21b ... Lower massage body
- 23 ... Kneading actuator
- 24 ... Patting actuator
- 25 ... Inclined rotary member
- 26 ... First rotary shaft
- 28 ... Clamper mechanism
- 31 ... Second rotary shaft
- 32 ... Patting motor
- 34 ... Circumferential actuator body
- 35 ... Housing
- 36 ... Link lever

37 ... Motor support base
38 ... Guide bar
39 ... Gear head
40 ... Guide frame
41 ... Vertical guide support part
42 ... Pivot
47 ... Lifting motor
48 ... Screw shaft
50 ... Slider
52 ... Transmission arm
53 ... Rail part
54 ... Non-slip member
64 ... Motor
66 ... Side plate part
80 ... First rotation restricting part
81 ... Second rotation restricting part
82 ... Rotation allowing part
85 ... Guide rail part
86 ... Sliding member
102 ... Chair-type massage device
103 ... Seat
104 ... Backrest
105 ... Footrest
106 ... Leg body
107 ... Side region kneading mechanism

- 108 ... Armrest
- 110 ... Holding groove
- 111 ... Kneading plate
- 112 ... Seat region massage mechanism
- 113 ... Thigh/hip massage mechanism
- 114 ... Back region massage mechanism
- 115 ... Leg kneading mechanism

CLAIMS

1. A chair-type massage device including a seat for a user to sit and a backrest provided at the rear of the seat, wherein:

a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, and airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat, and side regions of the backrest, and

a control part is provided to cause a massage motion by cooperatively operating the massage bodies of the back region massage mechanism and inflation of the airbags.

2. A chair-type massage device including a seat for a user to sit, a backrest provided at the rear of the seat, and a footrest provided in front of the seat, wherein:

a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat, and side regions of the backrest, and a leg kneading mechanism having kneading means adapted to apply a massage to the lower legs of the user is provided in the footrest, and

a control part is provided to cause a massage motion by cooperatively operating at least two of the massage bodies of the back region massage mechanism, inflation of the airbags, and the kneading means of the leg

kneading mechanism.

3. The chair-type massage device according to claim 1 or 2, wherein the control part is configured to coordinate by operating the back region massage mechanism:

a motion to position the massage bodies to the affected area;

a motion to make the massage bodies project toward the affected area;

and

a motion to inflate the airbags provided in at least one of the upper surface of the seat, the side regions of the seat, and the side regions of the backrest.

4. The chair-type massage device according to any one of claims 1 to 3, wherein

the back region massage mechanism has:

a massage mechanism including a pair of massage members containing treatment elements and disposed on right and left sides, and an actuator for transmitting the massage motion to the massage members;

a base member for holding the massage mechanism swingably in a back-and-forth direction by supporting the massage mechanism in a swing pivotal support part;

a vertical movement mechanism for making the base member movable in the vertical direction within the backrest;

an advancing/retracting motion mechanism for advancing/retracting the massage mechanism in the back-and-forth direction with respect to the

base member; and

a swing restricting mechanism for making the massage members sustainable in a forward projection state in bringing the massage members to project forward by the advancing/retracting motion mechanism.

5. The chair-type massage device according to claim 4, wherein:

each of the massage members is provided with treatment elements in an upper end portion and a lower end portion thereof; and

the swing restricting mechanism is configured to make the massage members sustainable in a forward projection state on the upper end portion side in bringing the upper end portions of the massage members to project forward by the advancing/retracting motion mechanism, and make the massage members sustainable in a forward projection state on the lower end portion side in bringing the lower end portions of the massage members to project forward by the advancing/retracting motion mechanism.

6. A method for controlling a chair-type massage device including a seat for a user to sit and a backrest provided at the rear of the seat, wherein a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, and airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat, and side regions of the backrest, and

a massage motion is caused by cooperatively operating the massage bodies of the back region massage mechanism and inflation of the airbags.

7. A method for controlling a chair-type massage device including a seat for a user to sit, a backrest provided at the rear of the seat, and a footrest provided in front of the seat, wherein a back region massage mechanism having massage bodies for applying a kneading massage to an affected area is provided in the backrest, airbags for performing a pressure massage are provided in at least one of an upper surface of the seat, side regions of the seat, and side regions of the backrest, and a leg kneading mechanism having kneading means adapted to apply a massage to the lower legs of the user is provided in the footrest, and

a massage motion is caused by cooperatively operating at least two of the massage bodies of the back region massage mechanism, inflation of the airbags, and the kneading means of the leg kneading mechanism.

8. The method for controlling the chair-type massage device according to claim 6 or 7, wherein a motion to position the massage bodies to the affected area, a motion to make the massage bodies project toward the affected area, and a motion to inflate the airbags provided in at least one of the upper surface of the seat, the side regions of the seat, and the side regions of the backrest are coordinated by operating the back region massage mechanism.