

SPECIFICATION

Title of Invention

EXERCISE APPARATUS

Technical Field

[0001]

The present invention relates to an exercise apparatus for performing an exercise of a treatment target region such as an abdomen and a thigh by pressing a treatment member against the treatment target region.

Background Art

[0002]

Among regions of a body, an abdomen mainly around a waist is especially susceptible to such as obesity, and it has been known that a proportion is extremely deteriorated in the case where such as fat is accumulated in the abdomen. Meanwhile, an abdomen is a region where beauty and slimming effects are highly effective, and in the case where the fat accumulated in the abdomen can be removed, the waist can be braced and the proportion can be remarkably improved. Therefore, in various conventional exercise apparatuses (such as a massage machine, health promotion unit, slimming instrument, beauty equipment, exercise machine and the like), there

has been developed an exercise apparatus capable of performing an effective massage for a treatment target region of a user.

[0003]

For example, in Patent Literature 1, disclosed is an exercise apparatus (i.e., a visceral fat reduction promoting instrument) which is equipped with a pressure application unit capable applying a pressure to an abdomen, wherein the pressure application unit is attached to a belt-shaped attachment body capable of surrounding the abdomen around an umbilical region and the pressure application unit is expanded and contracted by feeding and removing air and the like to and from the pressure application unit, thereby allowing visceral fat of the abdomen to be reduced.

Further, in Patent Literature 2, disclosed is a massage device which is provided with a protrusion part protruded to a side of an abdomen, wherein the massaging protrusion part enters deeply an abdominal wall to perform a massage to thereby allowing to perform an effective massage of the abdomen.

Citation List

Patent Literature

[0004]

Patent Literature 1: Japanese Unexamined Patent

Publication JP-A2008-17890

Patent Literature 2: Japanese Patent Gazette No.
3539964

Summary of Invention

Technical Problem

[Problem to be solved by the invention]

[0005]

Although the exercise apparatus of Patent Literature 1 mentioned above is adapted to apply a stimulus to a treatment target region by expanding and contracting an air bag (i.e., a treatment member) to press the treatment target region, it cannot be expected to apply a sufficient strong stimulus to the treatment target region because of using an air bag. However, in the case where a treatment target region is intended to be stimulated to burn fat to thereby perform shape-up, when the treatment target region to be stimulated is a soft region such as an abdomen, the soft treatment target region possibly absorbs the applied stimulus mostly and a sufficient shape-up effect may not possibly be obtained by a weak stimulus applied by such as an air bag. Therefore, when the treatment target region is a place such as an abdomen, it is inexpedient to adopt a system such as an exercise apparatus of Patent Literature 1.

[0006]

Meanwhile, the exercise apparatus of Patent Literature 2 is intended to strongly stimulate the treatment target region using a hard massaging body acute or pointed like a protrusion. However, the abdomen is a very delicate region, and if the treatment target region is stimulated too much strongly by such an acute treatment member, the periphery of the treatment target region may become itchy or painful and this may possibly cause a user to be discomforted at the time of massaging.

The present invention has been made in consideration of the circumstances mentioned above and its essential object is to provide an exercise apparatus capable of applying an effective exercise to a treatment target region by surely applying a stimulus to the treatment target region without accompanying an uncomfortable sense such as an itchy or painful sense.

Solution to Problem

[0007]

In order to attain the object mentioned above, following measures are taken by the present invention.

That is, an exercise apparatus according to the present invention is adapted to allow a treatment target region to perform an exercise by pressing a treatment member against the treatment target region, wherein a

rotation treatment element freely rotatable along a movement direction of the treatment member is provided on a side facing to the treatment target region of the treatment member, thereby allowing the treatment target region to perform the exercise by pressing the rotation treatment element against the treatment target region.

[0008]

Preferably, a cylindrical shaped roller member formed as the rotation treatment element is provided on the side facing to the treatment target region of the treatment member, whereby the treatment target region is allowed to perform the exercise by pressing the roller member against the treatment target region.

More preferably, the exercise apparatus includes: a pair of the treatment members which are provided so as to face each other; and a drive mechanism adapted to swingably drive the paired treatment members, wherein the roller member is provided at a distal end of the treatment member so that a shaft center thereof is oriented to a direction intersecting a swinging direction of the treatment member, and the roller member is freely rotatable about the shaft center.

[0009]

More preferably, a plurality of the roller members are provided on the treatment member.

More preferably, the drive mechanism includes: a drive motor; a rotating shaft rotated by the drive motor; and a conversion part adapted to convert a rotation drive power transmitted by the rotating shaft to a swinging of the treatment member, wherein the conversion part includes: a rotation boss part which is fixed to an axial intermediate portion of the rotating shaft and provided with an edgeless type cam surface inclined to the rotating shaft and the cam surface being formed over a circumference thereof; an annular fitting part formed at a proximal side of the treatment member and slidably fitting into the circumference of the rotating boss part; and a regulation part adapted to regulate a co-rotation of the annular fitting part with respect to the rotation boss part.

[0010]

More preferably, the regulation part includes a connecting rod connecting a proximal side of the treatment member and an installation fixing side, and one end portion of the connecting rod is connected to the installation fixing side via a first universal joint and the other end portion of the connecting rod is connected to the proximal end of the treatment member via a second universal joint.

More preferably, each of the first and second

universal joints is composed of a ball joint.

[0011]

More preferably, a half-turn clutch is provided on the rotating shaft, and this half-turn clutch enables a switching between a close departure swinging movement of the treatment member and a parallel swinging movement of the treatment member.

Advantageous Effects of Invention

[0012]

According to the exercise apparatus according to the present invention, it becomes possible to apply an effective exercise to a treatment target region by surely applying a stimulus to the treatment target region without accompanying an uncomfortable sense such as an itchy or painful sense.

Brief Description of Drawings

[0013]

Fig. 1 is a diagram showing a usage state of an exercise apparatus according to a first embodiment of the present invention;

Fig. 2 is a front perspective view showing an enlarged exercise apparatus in Fig. 1;

Fig. 3 is a back perspective view of the exercise apparatus of the first embodiment viewed from a treatment target region side (back side);

Fig. 4 is a back view of the exercise apparatus of the first embodiment;

Fig. 5 is a perspective view showing an internal structure of the exercise apparatus;

Fig. 6 is an enlarged view of a treatment member;

Fig. 7 is a perspective view showing a drive mechanism of the exercise apparatus;

Fig. 8A is a diagram showing a case where right and left treatment members are moved by close and departure swinging;

Fig. 8B is a diagram showing a case where the right and left treatment members are moved by swinging in parallel; and

Fig. 9 is a perspective view in the case where the exercise apparatus of the present invention is used for a massage machine (second embodiment).

Description of Embodiments

[0014]

[First Embodiment]

The following describes an embodiment of the present invention with reference to the accompanying drawings.

An exercise apparatus 1 of the present invention is adapted to apply an exercise by pressing a tip side

of a treatment member 2 against each region of a body (i.e., a treatment target region S) such as a neck, shoulder, lumbar and lower limb regions, and in particular the exercise apparatus 1 is appropriately used in the case of intending to apply an exercise to a soft treatment target region S such as an abdomen.

[0015]

In the following first embodiment, the exercise apparatus 1 of the present invention is described while illustrating an example making it possible to apply an exercise such as a shape-up exercise for slimming to an abdomen by pressing the exercise apparatus 1 against a treatment target region S of the abdomen to apply a stimulus.

As shown in Figs. 1 and 2, the exercise apparatus 1 of the first embodiment is adapted to be able to stimulate the treatment target region S of the abdomen by pressing the exercise apparatus 1 against the abdomen of a user using such as a belt 3.

[0016]

In specific, the exercise apparatus 1 of the first embodiment includes a laterally rectangular shaped main body part 4 formed in a degree of not being hindering even in the case of attaching the same to the abdomen of the user. On a surface (a rear surface or a back

surface) facing a user side of this main body part 4, there is provided a cover member 5 that prevents the treatment member 2 to be described later from directly contacting the abdomen (treatment target region S) of the user.

Further, as shown in Fig. 3, left and right treatment units 6 and 7 are laterally arranged in parallel inside the main body part 4, the left treatment unit 6 being adapted to apply a stimulus to a left half side of the treatment target region S and the right treatment unit 7 being adapted to apply a stimulus to a right half side of the abdomen. These left and right treatment units 6 and 7 are adapted to apply stimuli to the treatment target region S to allow a shape-up exercise of the treatment target region S.

[0017]

Further, the left and right treatment units 6 and 7 are driven by a drive mechanism 8 built in the main body part 4, whereby a stimulus can be applied to the treatment target region S. Moreover, the main body part 4 is equipped with an operation part (not shown) for switching the drive mechanism 8 on/off via a signal cable.

It is noted that the following description is made to proceed based on the directions shown in Fig. 4. According to the directions, the lateral direction in

Fig. 4 is a lateral direction (width direction) of the exercise apparatus 1 and the vertical direction in Fig. 4 is a vertical direction of the exercise apparatus 1. The direction passing through the paper in Fig. 4 is a back and forth direction of the exercise apparatus 1.

[0018]

The following describes a configuration of the exercise apparatus 1 of the first embodiment in turn.

As shown in Figs. 3 and 4, the main body part 4 of the exercise apparatus 1 includes a casing 9 having a rectangular shape long in the lateral direction in plan view. This casing 9 includes a bowl-shaped front side casing 10 formed in a state of opening rearward (toward a user side) and a lid member 11 fitted to the rearward opening of the front side casing 10. This lid member 11 exhibits a curved surface shape and two rectangular shaped openings 12 are laterally formed in parallel in the middle of the lid member 11. The left and right treatment members 2 (to be described in detail later) are provided so as to be protruded rearward from the left and right openings 12, respectively. This lid member 11 is formed in a plate shape made of a flexible material such as polypropylene, silicon rubber and the like. A cover member 5 (protective buffer cover body) composed of such as a cloth is provided on a rear surface of the

lid member 11 (in the user side) so that the treatment member 2 and the treatment target region S are indirectly contacted to each other via the cover member 5. That is, in the main body part 4, the front side casing 10 and the lid member 11 are fitted to each other to thereby form an accommodation space capable of accommodating the drive mechanism 8 to be described later inside the front side casing 10.

[0019]

As shown in Fig. 4, two massage units of the left and right treatment units 6 and 7 are laterally provided in parallel in the exercise apparatus 1 of the first embodiment. The left treatment unit 6 is provided in the left side opening 12 of the lid member 11 mentioned above, and the right treatment unit 7 is provided in the right side opening 12 of the lid member 11 mentioned above.

Each of the left and right treatment units 6 and 7 includes the treatment member 2 protruded rearward via the opening toward the side of the treatment target region S from the inside of the main body part 4. A cylindrical shaped roller member 13 (rotating treatment element) is provided on the tip of this treatment member 2 and the treatment target region S can be stimulated by pressing the roller member 13 against the treatment target region S.

[0020]

In specific, the treatment member 2 includes an arm member 14 and the roller member 13. The arm member 14 in each of the left and right treatment units 6 and 7 is provided so as to be protruded rearward. The roller member 13 is attached to the tip side of the arm member 14.

These left and right treatment units 6 and 7 have the same structures and arrangements to each other except for being symmetric left and right. Therefore, the right treatment unit 7 is exemplified and the configuration of the treatment unit is described in detail in the following description and an explanation of the left treatment unit 6 is omitted.

[0021]

As shown in Fig. 5, the arm member 14 of the right treatment unit 7 (treatment unit) is provided as a long rod-shaped member passing through the opening 12 of the lid member 11 mentioned above and protruding rearward from the inside of the main body part 4. In specific, the arm member 14 is provided with its proximal side in the longitudinal direction disposed in an inner upper side of the main body part 4 and is disposed in an inclined state with its tip side from the proximal portion side in the longitudinal direction slightly oriented downward.

The tip side of the arm member 14 protruded rearward in this way is positioned at a substantially intermediate portion of the main body part 4 in the vertical direction and is branched in a T-character shape (fork shape) in the left and right directions. The roller member 13 (rotating treatment element) mentioned above is provided at each of the branched the tip side.

[0022]

The proximal portion (front edge portion) of the arm member 14 is annular-shaped and is crossingly connected to a rotating shaft 15 of the drive mechanism 8 to be described later, and the arm member 14 can be swung in the lateral direction by rotating the rotating shaft 15. The drive of this arm member 14 is to be described in detail in the following explanation of the drive mechanism 8.

A first roller member 16 is provided at the right side branched tip of the branched tips of the arm member 14, and a second roller member 17 having a smaller width than that of the first roller member 16 is provided at the left side branched tip. The arrangements of these roller members 16 and 17 are symmetric between the left treatment unit 6 and the right treatment unit 7. That is, in the left treatment unit 6 arranged to be symmetric to the right treatment unit 7, the first roller member

16 is provided at the tip of the left side branched arm member 14 and the second roller member 17 is provided at the tip of the right side branched arm member 14. By arranging the first and second roller members 16 and 17 in this way, the arrangements of the four roller members 13 are symmetric with respect to a center, and the respective roller members 13 can be surely contacted to the abdomen having a curved surface along the curved surface, whereby the abdomen can be effectively stimulated with the treatment member 2.

[0023]

Each of the first and second roller members 16 and 17 is a cylindrical body with its axis center oriented in the substantially vertical direction (so as to intersect the swinging direction of the arm member 14) and is rotatable about the axis oriented to the vertical direction. In other words, each of the first and second roller members 16 and 17 is formed to be a cylindrical body with its axis center oriented to the direction intersecting the swinging direction thereof.

[0024]

In addition, the first roller member 16 is a cylindrical body having a diameter substantially equal to that of the second roller member 17 and a roll length thereof along the vertical direction is made longer (in

a degree of 1.5 times in the example shown in Fig. 5) than that of the second roller member 17. By arranging the four roller members in this way, a force applied to the treatment target region S can be equally divided by the four roller members 13 to be transmitted, whereby the stimulus can be equally applied to the whole surface of the treatment target region S.

[0025]

Next, the drive mechanism 8 for driving the arm member 14 of the left treatment unit 6 and the arm member 14 of the right treatment unit 7 mentioned above will be described.

As shown in Figs. 5 to 8A and 8B, the drive mechanism 8 is equipped with a drive part 18, a conversion part 19 and a regulation part 20, wherein a rotating drive force generated by an electric motor of the drive part 18 is converted by the conversion part 19 and the converted drive force is transmitted to a rotating shaft 15 and the rotating shaft 15 is rotated to thereby swing the arm member 14.

[0026]

The drive part 18 is configured of an electric motor 22 arranged on the underside of a center of the main body part 4 (front side casing 10) with its drive shaft 21 oriented in the vertical direction and a power

transmission part 23 for transmitting a rotating drive power generated by the electric motor 22 to the rotating shaft 15 oriented in the lateral direction. The electric motor 22 is connected to a control part (not shown) and a power supply part (not shown), and by operating an operation part (remote control part) by a user, the rotation can be switched ON/OFF, the number of revolutions of the electric motor 22 can be changed and a rotating direction can be switched between a normal rotation and a reverse rotation. Further, the drive shaft 21 of the electric motor 22 is arranged along the vertical direction and a tip side (top side) of the drive shaft 21 is connected to the power transmission part 23.

[0027]

The power transmission part 23 is adapted to decelerate the rotating movement of the drive shaft 21 oriented in the vertical direction and switch the rotating direction by 90 degrees to thereby convert to a rotating movement of the rotating shaft 15 arranged along the lateral direction. In addition, the power transmission part 23 of the present embodiment is configured of a worm gear and a worm wheel.

The conversion part 19 is adapted to convert the rotating movement of the rotating shaft 15 provided to be oriented in the lateral direction to a swinging

movement to swing the arm member 14 along the lateral direction. The conversion part 19 is configured of an annular fitting part 24 which is integrally formed with the proximal portion of the arm member 14 and a rotating boss part 25 which is fixed to the rotating shaft 15. The annular fitting part 24 is attached so as to be relatively rotatably fitting into an outer periphery (circumference) of the rotating boss part 25. Moreover, the conversion part 19 is equipped with a regulation part 20 for regulating the annular fitting part 24 from co-rotating with respect to the rotating boss part 25.

[0028]

In specific, on the outer peripheral surface (circumferential surface) of the rotating boss part 25, there is formed a generally circular edgeless typed track (cam surface) having an axis center inclined with respect to the rotating shaft 15. The annular fitting part 24 is relatively rotatable with respect to the rotating boss part 25 along this track. It is noted that the inclination direction of the track formed on the rotating boss part 25 of the arm member 14 of the left treatment unit 6 is reverse to the inclination direction of the track formed on the rotating boss part 25 of the arm member 14 of the right treatment unit 7, and the swinging direction of the arm member 14 of the left treatment unit

6 and the swinging direction of the arm member 14 of the right treatment unit 7 are set to be reverse to each other.

[0029]

The regulation part 20 includes a connecting rod 26 for connecting between the inner peripheral surface of the casing 9 and the arm member 14, and the rotation by co-rotating of the annular fitting part 24 (i.e., arm member 14) about the axis center of the rotating shaft 15 can be regulated. This connecting rod 26 is a long rod-shaped member with its both ends formed to be spherical shaped. The portions of the both ends formed to be spherical shaped are loosely fitted to a first and second gearing parts 27 and 28 to be described later.

[0030]

For example, in the case of exemplifying the connecting rod 26 provided in the right treatment unit 7, one end (bottom end) of the connecting rod 26 is pivoted by the first bearing part 27 provided in an inner wall surface (setting fixture side) of the front side casing 10 and the other end (top end) of the connecting rod 26 is pivoted by the second bearing part 28 provided in the intermediate side in the longitudinal direction of the arm member 14. The other end of this connecting rod 26 is positioned in a rear upper side when viewing from the one end, and the connecting rod 26 is arranged so as to

be inclined rearward to the upper side.

[0031]

The first bearing part 27 is a recess formed to be recessed in a semi-spherical shape to an intermediate side in the vertical direction in the inner surface wall of the casing 9 and configured to be able to pivot the spherical end portion provided in the side of one end of the connecting rod 26 mentioned above. One end portion of this connecting rod 26 and the first bearing part 27 are rotatably connected by a first universal joint 29 of a ball joint type. As shown in Fig. 6, the second bearing part 28 is a recess formed to be recessed in a semi-spherical shape to an intermediate side from the proximal side to the distal side in the arm member 14 and configured to be able to pivot the spherical end portion provided in the side of the other end of the connecting rod 26 mentioned above. The other end portion of this connecting rod 26 and the second bearing part 28 are rotatably connected by a second universal joint 30 of a ball joint type.

[0032]

As described above, by using the regulation part 20 of the ball joint type configured of the connecting rod 26, first bearing part 27 and second bearing part 28, in the case where the rotating boss part 25 fixed

to the rotating shaft 15 is rotated and the annular fitting part 24 is to be co-rotated, since the arm member 14 is connected to the front side casing 10 by the connecting rod 26, the annular fitting part 24 attached with the arm member 14 is also prevented from rotating and the co-rotation of the annular fitting part 24 can be regulated. At this time, since the connecting rod 26 is connected to the first and second bearing parts 27 and 28 respectively in a manner of being freely swingable in the vertical and lateral directions, it becomes possible to permit the arm member 14 to swing not only in the lateral direction but also in the vertical direction to some degree. With this configuration, the first and second roller members 16 and 17 are mainly perform a reciprocal movement along the lateral direction. As a result of this, the first and second roller members 16 and 17 roll along the surface of the treatment target region S to thereby apply a stimulus to such as muscles etc. within the treatment target region S, whereby the muscles in the treatment target region S are contracted to perform an exercise and blood circulation is improved to remove swelling and the like to make it possible to shape up the treatment target region S.

[0033]

As shown in Fig. 7 and the like, a half-turn clutch

31 is mounted to the rotating shaft 15 (rotating axis center) of the drive mechanism 8 mentioned above for switching between the close departure swinging movement and the parallel swinging movement of the treatment member 2. In specific, the rotating shaft 15 is divided into left and right two shaft parts in the right side of the left side rotating boss part 25, and the half-turn clutch 31 is provided between the two shaft parts for connecting both of the two shaft parts. The half-turn clutch 31 is configured by combining a first coupling member 32 provided in a drive side (right side) and a second coupling member 33 provided in a side of the arm member 14 (left side). The first coupling member 32 is a cylindrical member which is provided so as to be protruded leftward, and the second coupling member 33 is a cup shaped member to which the first coupling member 32 can be inserted. Connecting recesses 34 are formed in two positions at intervals of 180 degrees in the circumferential direction in an opening of the second coupling member 33, while a connecting protrusion 35 which can be inserted to any of the two connecting recesses 34 are provided on the outer peripheral surface of the first coupling member 32. This connecting recess 34 is formed by cutting off a part of an opening edge of the second coupling member 33 so as to be recessed

in a semicircular shape at a relatively shallow depth made in a degree of the connecting protrusion 35 being able to be fitted shallowly.

[0034]

Therefore, by using the half-turn clutch 31, in the case where a power is applied to the second coupling member 33 so as to stop a rotation in a state that the connecting protrusion 35 of the first coupling member 32 is connected to one of the two connecting recesses 34, the connecting protrusion 35 of the first coupling member 32 is disengaged from one of the connecting recesses 34. Then, the connecting protrusion 35 of the first coupling member 32 is rotated by a half rotation integrally with the rotating shaft 15, and the connecting protrusion 35 is fitted into the other connecting recess 34, whereby a rotation phase of the arm member 14 with respect to the rotating shaft 15 is changed by 180 degrees.

[0035]

That is, with use of the half-turn clutch 31 as described above, as shown in Fig. 8A, the swinging direction of the left side arm member 14 and the swinging direction of the right side arm member 14 can be made different to each other in the lateral direction. In this case, the left side arm member 14 and the right side

arm member 14 perform the swinging movements so as to mutually repeat the close and departure movements.

Further, by restraining the arm member 14 to render the second coupling member 33 to stop the rotation and to render the half-turn clutch 31 to operate, as shown in Fig. 8B, the swinging direction of the left side arm member 14 and the swinging direction of the right side arm member 14 can be made equal to each other in the lateral direction. In this case, the left side arm member 14 and the right side arm member 14 perform the swinging movements in the lateral direction so as to be interlocked with each other.

[0036]

That is, by moving the left and right arm members 14 as shown in Fig. 8A, the left and right arm members 14 repeats the close and departure to each other, whereby it becomes possible to perform a close and departure swinging movement so as to pinch and stretch the treatment target region S. Further, by moving the left and right arm members 14 as shown in Fig. 8B, the left and right arm members 14 perform the reciprocal movement in the lateral direction while keeping the same distance from each other, whereby it becomes possible to perform a parallel travel swinging movement so as to largely slide the treatment target region S in the lateral direction,

and it becomes possible to apply a shape-up movement to the treatment target region S with high variation.

[0037]

With use of the exercise apparatus 1 as described above, the left side and right side arm members 14 swing along the lateral direction and the first and second roller members 16 and 17 (rotating treatment elements) provided on the tips of the arm members 14 apply stimuli to the treatment target region S while rolling on the surface of the treatment target region S. Thus, the muscles in the treatment target region S are contracted to perform an exercise and blood circulation is improved to remove swelling and the like to make it possible to shape up the treatment target region S.

[0038]

At this time, since the lid member 11 is configured of an elastic material with high flexibility, even if a foreign substance is caught between the treatment member 2 (such as the arm member 14 and the roller member 13) protruded from the opening 12 and the opening 12, the equipment is less likely to be damaged.

Further, in the exercise apparatus 1 as described above, a strong power is likely to act on the treatment target region S from the roller member 13 (rotating treatment element), the roller member 13 rolls to relieve

the power. Therefore, a sense of discomfort such as itching and a pain is never affected to the treatment target region S compared to a case of pressing with such as a hard protrusion. Further, since the roller member 13 rolls to relieve the power, the cover member 5 can be prevented from being damaged.

[0039]

Moreover, in the exercise apparatus 1 as described above, since the regulation part 20 of the ball joint type is used, the arm member 14 can be permitted to swing not only in the lateral direction but also swing in the vertical direction to some degree. As a result of this, it becomes possible that the first and second roller members 16 and 17 roll laterally and vertically (mainly swing in the lateral direction) on the surface along the surface of the treatment target region S to thereby cover a wide range. Thus, it becomes possible to apply an effective shape-up exercise also to a wide ranging treatment target region S such as an abdomen.

[Second Embodiment]

By the way, the exercise apparatus 1 as described above may be also adopted as a configuration of a massage machine. For example, the massage machine is attached to a region generating "stiffness" (i.e., a region where fatigues are accumulated) such as a neck and a waist to

thereby mainly massage the target region to be able to improve the blood circulation.

[0040]

Preferably, the massage machine as mentioned above may have a configuration as following.

That is, it is preferable to configure that, in the massage machine adapted to apply a massage by pressing a treatment member 2 against a treatment target region S, a rotation treatment element freely rotatable along a movement direction of the treatment member 2 is provided on a side facing to the treatment target region S of the treatment member 2, thereby applying the massage to the treatment target region S by pressing the rotation treatment element against the treatment target region S.

[0041]

In the massage machine described above, preferably, a cylindrical shaped roller member 13 formed as the rotation treatment element is provided on the side facing to the treatment target region S of the treatment member 2, whereby the treatment target region S is allowed to perform the exercise by pressing the roller member 13 against the treatment target region S.

In the massage machine described above, preferably, a pair of the treatment members 2 are provided so as to

face each other; and a drive mechanism 8 adapted to swingably drive the paired treatment members 2 is included, wherein the roller member 13 is provided at a distal end of the treatment member 2 so that a shaft center thereof is oriented to a direction intersecting a swinging direction of the treatment member 2, and the roller member 13 is freely rotatable about the shaft center.

[0042]

In the massage machine described above, preferably, a plurality of the roller members 13 (for example, a first roller member 16 and a second roller member 17) are provided along the swinging direction of the treatment member 2.

In the massage machine described above, preferably, the drive mechanism 8 includes: a drive motor 22; a rotating shaft 15 rotated by the drive motor 22; and a conversion part 19 adapted to convert a rotation drive power transmitted by the rotating shaft 15 to a swinging of the treatment member 2, wherein the conversion part 19 includes: a rotation boss part 25 which is fixed to an axial intermediate portion of the rotating shaft 15 and provided with an edgeless type cam surface inclined to the rotating shaft 15 and the cam surface being formed over a circumference thereof; an annular fitting part

24 formed at a proximal side of the treatment member 2 and slidably fitting into the circumference of the rotating boss part 25; and a regulation part 20 adapted to regulate a co-rotation of the annular fitting part 24 with respect to the rotation boss part 25.

[0043]

In the massage machine described above, preferably, the regulation part 20 includes a connecting rod 26 connecting a proximal side of the treatment member 2 and an installation fixing side, and one end portion of the connecting rod 26 is connected to the proximal end of the treatment member 2 via a first universal joint 29 and the other end portion of the connecting rod 26 is connected to the installation fixing side via a second universal joint 30.

In the massage machine described above, preferably, each of the first and second universal joints 29 and 30 is composed of a ball joint.

[0044]

In the massage machine described above, preferably, a half-turn clutch 31 is provided on the rotating shaft center, and this half-turn clutch 31 enables a switching between a close and departure swinging movement of the treatment member 2 and a parallel swinging movement of the treatment member 2.

Fig. 9 shows a usage of a technique of the exercise apparatus 1 described in the first embodiment for application of the massage machine.

[0045]

The massage machine 100 of the second embodiment shown in Fig. 9 is a pillow typed massage machine formed to have a shape such as a long cylindrical body crushed to be flattened along the lateral direction, wherein a center side in a width direction (lateral direction) is constricted so as to be recessed downward, and by putting a head of a user on the constricted portion (recess 39), the treatment target region S covering the neck and shoulder of the user can be treated (massaged).

[0046]

In specific, similarly to the first embodiment, the massage machine 100 includes, in a hollow casing 9, the treatment member 2 composed of the arm member 14 and the roller member 13 and further includes the drive mechanism 9 for driving the treatment member 2. In this casing 9, there are formed a pair of left and right openings 12 each of which is opened toward a neck and shoulder regions of a user. In an example shown in Fig. 9, the openings 12 are formed in the left and right sides of an edge of an upper surface of the casing 9. Among these two openings 12, a left treatment unit 6 is provided in the

left side opening 12 and a right treatment unit 7 is provided in the right side opening 12, and it becomes possible to massage the treatment target region S using the left and right treatment units 6 and 7.

[0047]

The massage machine 100 of the second embodiment described above is different from that of the first embodiment in view of the arrangement of the roll member 13 attached to the tip side of the arm member 14 and a configuration of the regulation part 20 of the drive mechanism 9 regulating a co-rotation of the annular fitting part 24 with respect to the rotating boss part 25.

That is, in the massage machine 100 of the second embodiment, the arm member 14 is branched in a Y character shape from a middle portion into two arm members (i.e., a first arm member which extends long downward from the annular fitting part 24 and a second arm member which is provided in a protruded shape protruded upward from the annular fitting part 24). Similarly to the first embodiment, the roll member 13 composed of the first and second roll members 16 and 17 is provided in the tip side of the branched arm member 14. These first and second roll members 16 and 17 are different from those of the first embodiment and these first and second roll members

16 and 17 are provided in parallel along the direction (back and forth direction) perpendicular to the swinging direction of the arm member 14. Thus, in the case of arranging the plurality of roll members 13, a wide range can be treated at the same time by swinging the arm member 14.

[0048]

In addition, the regulation part 20 provided in the drive mechanism 9 of the second embodiment is different from that of the first embodiment and is composed of a rod-shaped regulation protrusion 37 protruded downward from the annular fitting part 24 and a regulation groove portion 38 into which the regulation protrusion 37 is fitted. The groove of the regulation groove portion 38 is formed along the lateral direction so as to be along the shaft center of the rotating shaft 15. That is, the regulation groove portion 38 permits the movement of the regulation protrusion 37 along the lateral direction but does not permit a movement of the regulation protrusion 37 in the back and forth direction. In other words, the regulation groove portion 38 does not permit the annular fitting part 24 to co-rotate to be rotated about the shaft center of the rotating shaft 15, whereby it becomes possible to massage the treatment target region S by swinging similarly to the first embodiment.

[0049]

It is noted that, in the second embodiment, although there is exemplified a configuration of providing the regulation protrusion 37 in the side of the annular fitting part 24 and providing the regulation groove portion 38 in the side of the casing 9, a regulation part 20 composed of the regulation groove portion 38 provided in the side of the annular fitting part 24 and the regulation protrusion 37 provided in the side of the casing 9 may be used.

By the way, in the embodiments disclosed this time, matters which are not explicitly described, for example, a working condition and an operating condition, a size or weight of the composition and the like are not depart from a range to be normally carried out by those skilled in the art, but matters easily be anticipated by those ordinary skilled in the art is adopted.

[0050]

For example, although there is exemplified using the roll member 13 with its axis center oriented in the vertical direction as the rotating treatment element in the embodiments, there can be used a member other than the roll member 13 as the rotating treatment element, or for example, a single or a plurality of ball type members may be also used.

Reference Signs List

[0051]

- 1 ... Exercise apparatus
- 2 ... Treatment member
- 3 ... Belt
- 4 ... Main body part
- 5 ... Cover member
- 6 ... Left treatment unit
- 7 ... Right treatment unit
- 8 ... Drive mechanism
- 9 ... Casing
- 10 ... Front side casing
- 11 ... Lid member
- 12 ... Opening
- 13 ... Roller member
- 14 ... Arm member
- 15 ... Rotating shaft
- 16 ... First roller member
- 17 ... Second roller member
- 18 ... Drive unit
- 19 ... Conversion part
- 20 ... Regulation part
- 21 ... Drive shaft
- 22 ... Electric motor
- 23 ... Power transmission part

- 24 ... Annular fitting part
- 25 ... Rotating boss part
- 26 ... Connecting rod
- 27 ... First bearing part
- 28 ... Second bearing part
- 29 ... First universal joint
- 30 ... Second universal joint
- 31 ... Half-turn clutch
- 32 ... First coupling member
- 33 ... Second coupling member
- 34 ... Coupling recess
- 35 ... Coupling protrusion
- 37 ... Regulation protrusion
- 38 ... Regulation groove part
- S ... Treatment target region

CLAIMS

1. An exercise apparatus adapted to allow a treatment target region to perform an exercise by pressing a treatment member against the treatment target region, wherein

a rotation treatment element freely rotatable along a movement direction of the treatment member is provided on a side facing to the treatment target region of the treatment member, thereby allowing the treatment target region to perform the exercise by pressing the rotation treatment element against the treatment target region.

2. The exercise apparatus according to claim 1, wherein a cylindrical shaped roller member formed as the rotation treatment element is provided on the side facing to the treatment target region of the treatment member, and wherein

the treatment target region is allowed to perform the exercise by pressing the roller member against the treatment target region.

3. The exercise apparatus according to claim 2 comprising:

a pair of the treatment members which are provided

so as to face each other; and

a drive mechanism adapted to swingably drive the paired treatment members, wherein

the roller member is provided at a distal end of the treatment member so that a shaft center thereof is oriented to a direction intersecting a swinging direction of the treatment member, and the roller member is freely rotatable about the shaft center.

4. The exercise apparatus according to claim 3, wherein a plurality of the roller members are provided on the treatment member.

5. The exercise apparatus according to claim 3, wherein the drive mechanism comprises: a drive motor; a rotating shaft rotated by the drive motor; and a conversion part adapted to convert a rotation drive power transmitted by the rotating shaft to a swinging of the treatment member, wherein

the conversion part includes: a rotation boss part which is fixed to an axial intermediate portion of the rotating shaft and provided with an edgeless type cam surface inclined to the rotating shaft and the cam surface being formed over a circumference thereof; an annular fitting part formed at a proximal side of the treatment

member and slidably fitting into the circumference of the rotating boss part; and a regulation part adapted to regulate a co-rotation of the annular fitting part with respect to the rotation boss part.

6. The exercise apparatus according to claim 5, wherein the regulation part includes a connecting rod connecting a proximal side of the treatment member and an installation fixing side, and wherein

one end portion of the connecting rod is connected to the installation fixing side via a first universal joint and the other end portion of the connecting rod is connected to the proximal end of the treatment member via a second universal joint.

7. The exercise apparatus according to claim 6, wherein each of the first and second universal joints is composed of a ball joint.

8. The exercise apparatus according to any one of claims 3 to 7, wherein a half-turn clutch is provided on the rotating shaft, and this half-turn clutch enables a switching between a close departure swinging movement of the treatment member and a parallel swinging movement of the treatment member.