

DESCRIPTION

BALANCE FITNESS MACHINE

TECHNICAL FIELD

[0001]

This invention relates to a balance fitness machine for contributing to improvement of the fitness of a user by promoting muscle exercise and stretch exercise of the user as well as developing the sense of balance of the user.

BACKGROUND ART

[0002]

Along with the fitness boom of recent years, various fitness machines have been developed and marketed. For example, an exercise-assisting device provided with a forwardly and backwardly rotatable circular plate on which a user (person) mounts in a standing posture so that the user can perform an exercise of twisting the hips to the left and right alternately is known (see for example Patent Document 1).

This exercise-assisting device is one that promotes twisting movement and stretching movement of the user's lower back. Consequently, exercising other parts such as for example thigh muscle and abdominal muscle with it has been difficult.

Examples of activities that involve exercising the whole body including the thigh muscles and the abdominal muscles include swimming and skiing. In particular, with skiing and the like it is possible to move the whole body about the lower body and to develop the sense of balance. And, as exercises similar to skiing, there are snowboarding and surfing, and skateboarding, which is popular among young people, and so on. With these exercises it is possible to obtain an exercise effect similar to that of skiing (muscle strengthening and stretch exercise of the whole body).

[0003]

A along with the above-mentioned fitness boom, there have been growing needs for the development of a fitness machine with which it is possible to obtain at home the exercise effects that can be gained through snowboarding and surfing.

In Patent Document 2, a snowboard training apparatus is disclosed which would seem to be able to meet the above needs. This training apparatus has an arch-shaped rail, a turning part consisting of a pair of elastic bodies positioned at the length-direction ends of this rail, a snowboard having a rear end engaged with the rail, a support part for rotatably and rockably supporting a front end of this snowboard, and a handle provided in the vicinity of this supporting part.

[0004]

By using this training apparatus, it is possible to learn

basic turns necessary in snowboarding, an effect of exercising the whole body about the lower body can be obtained, and the sense of balance can be developed.

Patent Document 1: JP-A-55-26946

Patent Document 2: JP-A-2001-149518

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0005]

However, when ordinary users use the snowboard training apparatus of Patent Document 2, it is expected that most of them do not know how to glide with a snowboard, and it is quite conceivable that they will have difficulty due to not knowing how to use the apparatus.

And, this snowboard training apparatus is operated by moving the snowboard with intent and movements of the user himself or herself. Consequently, there is no predetermined individual movement, and exercise rate and exercise duration time of the different parts of the body may differ every time.

For above reasons, users may fail to do whole body exercise and stretch exercise effectively, resulting in not only failure of achieving targets for dieting, shaping-up and the like, but also damages in muscles of the users themselves.

[0006]

The present invention was made in view of the

circumstances described above, and an object of the invention is to provide a balance fitness machine capable of automatically and stably and also uniformly effecting muscle exercise and stretch exercise and exercise for increasing sense of balance, so that a user can obtain an intended effect (diet effect, shape-up effect, effect of resolving a lack of exercise) without excess or deficiency.

MEANS FOR SOLVING THE PROBLEMS

[0007]

To achieve the above-mentioned object, in the invention the following technological means were devised.

That is, a balance fitness machine according to the invention is characterized in having:

a platform capable of carrying a user mounting thereon in a standing posture;

a rocking mechanism for rocking this platform in a front-rear or left-right direction; and

driving means for driving this rocking mechanism.

With this arrangement, when the driving means is driven, the platform undergoes complex rocking motion via the rocking mechanism. Since the rocking motion causes the user mounting on the platform in a standing posture to lose balance, the user tries to maintain the balance by moving the muscles of all parts of the body so as to resist the imbalance. Consequently, the

user's sense of balance is developed, and muscle exercise and stretch exercise is effected. As a result, the user can obtain various effects such as a dieting effect, a shape-up effect, and a resolution of a shortage of exercise.

[0008]

Preferably, the platform has a long-by-narrow shape.

With forming the platform in a long-by-narrow shape like the shapes of a surfboard, a snowboard, or a skateboard, the user can perform the balance exercise described above with a feeling of actually riding one of those boards.

More preferably, the platform is linked to the rocking mechanism by way of support members formed of resilient bodies.

With this arrangement, the platform undergoes more complex rocking motion.

[0009]

It is also desirable that the rocking mechanism is disposed below the platform and for the driving means is disposed on a side of the rocking mechanism.

With this arrangement, an apparatus with reduced size can be obtained.

Further, the rocking mechanism has
a support plinth on which the platform is mounted,
a first support shaft and a second support shaft
supporting this support plinth from below, and
a support part for supporting the first support shaft

and the second support shaft, in which

the first support shaft has a first axle projecting from both ends in an axial direction thereof for eccentrically rotatably supporting the first support shaft,

the second support shaft has a second axle projecting from both ends in an axial direction thereof for oscillatably supporting the second support shaft, and

the first axle and the second axle are supported by the support part horizontally and with a predetermined spacing between them.

[0010]

The driving means preferably rotationally drives the first axle of the first support shaft of the rocking mechanism.

Further, the rocking mechanism has oscillating means for oscillating the support plinth in the axial direction of the first support shaft, and this oscillating means has

an oscillating member connected to the support plinth;

a slide support shaft disposed along the axial direction of the first support shaft for slidably supporting this oscillating member; and

a guide member for oscillating the oscillating member along this slide support shaft, in which

the guide member is formed in a cylindrical shape and is rotatable about an axis parallel with the axis of the first support shaft, a spiral cam groove is formed in an outer

circumferential face of this guide member, and a guide pin to be slidably fitted in the cam groove is provided on the oscillating member.

[0011]

Additionally, in the rocking mechanism, it is very desirable that the first axle, the second axle, and the guide member are disposed such as to be horizontally parallel to each other.

With this arrangement, the thickness of the rocking mechanism in the up-down direction can be made thinner.

Preferably, the ratio of the rotational speed of the guide member to the rotational speed of the first axle is set as 1:2.

With this arrangement, the rocking motion of the platform can be made more complex.

EFFECTS OF THE INVENTION

[0012]

According to this invention, it becomes possible to automatically and stably and also uniformly effect muscle exercise and stretch exercise extending over a whole human body and exercise for increasing sense of balance.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

[Fig. 1] Fig. 1 is a perspective view of an exterior of a balance fitness machine;

[Fig. 2] Fig. 2 is a perspective view of the balance fitness machine;

[Fig. 3] Fig. 3 is a front view of the balance fitness machine;

[Fig. 4] Fig. 4 is a perspective view of a rocking mechanism;

[Fig. 5] Fig. 5 is a perspective view of the rocking mechanism;

[Fig. 6] Fig. 6 is another perspective view of the rocking mechanism;

[Fig. 7] Fig. 7 is an enlarged perspective view of the rocking mechanism;

[Fig. 8] Fig. 8 is a front view of a balance fitness machine according to a second embodiment;

[Fig. 9] Fig. 9 is a front view of a balance fitness machine according to a third embodiment; and

[Fig. 10] Fig. 10 is a perspective view showing a mode of use of a balance fitness machine.

DESCRIPTION OF REFERENCE NUMERALS

[0014]

1: platform

2: rocking mechanism

3: driving means
7: first support shaft
8: second support shaft
9: support parts
10: support plinth
12: first axle
13: second axle
25: oscillating means
26: oscillating member
27: slide support shafts
28: guide member
33: guide pin
34: cam groove
48: support members

BEST MODE FOR CARRYING OUT THE INVENTION

[0015]

An embodiment of the invention will now be described with reference to the drawings.

Hereinafter, in Fig. 1 to Fig. 4, the direction X will be called the front-rear direction, the direction Y will be called the left-right direction, and the direction Z will be called the up-down direction.

Fig. 1 through Fig. 7 show a first embodiment of the invention.

As shown in Fig. 1 and Fig. 2, a balance fitness machine of this embodiment has a platform 1 on which a user H stands in an upright posture. Below this platform 1, there is provided a rocking mechanism 2 for rocking the platform 1 in the left-right direction or the front-rear direction or the up-down direction. This rocking mechanism 2 is driven by driving means 3 shown in Fig. 3. The rocking mechanism 2 and the driving means 3 are disposed on a machine bed 4.

Normally, the rocking mechanism 2 and the driving means 3 are covered by a cover 11, as shown in Fig. 1.

[0016]

As shown in Fig. 2 and Fig. 3, the machine bed 4 has a pair of base plates 5, 5 extending in the front-rear direction, and a substantially rectangular machine plate 6 that connects the pair of the base plates 5, 5 at intermediate portions thereof, and the pair of base plates 5, 5 and the machine plate 6 form an H shape in plan view.

The rocking mechanism 2 is mounted on the machine plate 6. This rocking mechanism 2, as shown in Fig. 4 and Fig. 6, has a first support shaft 7, a second support shaft 8, and support parts 9 that support the first support shaft 7 and the second support shaft 8. On the first support shaft 7 and the second support shaft 8, a support plinth 10 is disposed to be supported by them.

[0017]

The first support shaft 7 has a first axle 12 projecting from both ends in an axial direction thereof and eccentrically rotatably supporting the first support shaft 7. The second support shaft 8 has a second axle 13 projecting both ends in an axial direction thereof and capable of oscillatably supporting the second support shaft 8. The first axle 12 and the second axle 13 are supported by the support parts 9, 9 with a predetermined spacing between them in the front-rear direction.

Specifically, the support parts 9 extending in the front-rear direction are uprightly mounted on side portions of the machine plate 6 in the left-right direction. Each of the first axles 12 extending on left and right sides is rotatably fitted in each of front portions of this left and right pair of support parts 9, 9, so that the first support shaft 7 is supported with its axis oriented in the left-right direction. The first support shaft 7 is eccentric with respect to the first axle 12, and when the first axle 12 is rotated, the first support shaft 7 rotates eccentrically.

[0018]

Each of the second axles 13 extending on left and right sides is rotatably fitted in each of rear portions of the support parts 9, so that the second support shaft 8 is supported with its axis oriented in the left-right direction. The second support shaft 8 also is eccentric with respect to the second

axle 13, and, as shown by the arrow A in Fig. 4, the second support shaft 8 oscillates in the front-rear direction.

As shown in Fig. 4 and Fig. 5, the support plinth 10, which is formed in a rectangular parallelepiped box shape with its underside opened, is disposed above the first support shaft 7 and the second support shaft 8. The support plinth 10 and the support shafts 7, 8 are connected by way of a plurality of support shaft receiving members 14.

Specifically, the support shaft receiving members 14 project downward from four points in front/rear and left/right, respectively, of the underside of the support plinth 10. A boss part 15 is provided on each end of two support shaft receiving members 14 on the front side. The boss part 15 fits rotatably on the first support shaft 7. Similarly, a boss part 15 provided on each end of two support shaft receiving members 14 on the rear side fits rotatably on the second support shaft 8.

[0019]

The boss parts 15 are slidable in the axial directions of the first support shaft 7 and the second support shaft 8, and enable the support plinth 10 to reciprocate in the left-right direction, which will be described later.

The platform 1 on which a user H stands is attached to an upper face of this support plinth 10. Specifically, as shown in Fig. 2 and Fig. 3, extension plates 16 are disposed

on the front and rear portions of the support plinth 10 such as to project in the front and rear directions from positions a predetermined distance below the upper face of the support plinth 10, respectively. And the platform 1 is attached to the upper face of this extension plate 16 by way of an unresilient connecting member 17.

The platform 1 of this embodiment has a long-by-narrow plate shape that is substantially the same shape as a rideable board such as a snowboard or a skateboard, and each of its length-direction ends is formed to curve upward.

[0020]

The driving means 3, which rotationally drives the first axle 12, is provided on a side of the rocking mechanism 2.

That is, as shown in Fig. 5, an electric motor 20 is mounted on the outer side of the support member 9 on the right side in plan view. Rotation of the drive shaft of this electric motor 20 is converted into rotation about the first axle 12 by a worm gear mechanism 22 provided in a gearbox 21 mounted at the front end of this drive shaft, and rotates this first axle 12.

With this construction, driving the electric motor 20 causes the first axle 12 to rotate. And, along with that, the eccentric first support shaft 7 rotates eccentrically up and down and to the front and rear. Consequently, the support plinth 10 and the platform 1 oscillate up and down and to the

front and rear.

[0021]

And, in cooperation with (following) the rotation of the first support shaft 7, the second support shaft 8 oscillates forward and rearward about the second axle 13, as shown by the arrow A in Fig. 4, and the platform 1 performs a motion similar to this.

The rocking mechanism 2 of this embodiment has oscillating means 25 for oscillating the support plinth 10 and the platform 1 in the left-right direction (axial direction of each of the support shafts), which is disposed between the first support shaft 7 and the second support shaft 8 disposed at the front and rear positions.

This oscillating means 25, as shown in Fig. 6, has an oscillating member 26 for oscillating the support plinth 10 to the left and right, slide support shafts 27 for supporting this oscillating member 26 slidably in the left-right direction, and a guide member 28 for sliding the oscillating member 26 in the axial direction of the slide support shafts 27.

[0022]

The oscillating member 26 has a main body part 29 attached to the slide support shafts 27, and a pair of projecting parts 30, 30 projecting upward from this main body part 29. The main body part 29 is formed in a plate shape or a box shape that

is square in plan view. And, through holes 31 for passing the slide support shafts 27 therethrough are formed in the main body part 29 such as to pass therethrough in the left-right direction. The through holes 31 are formed in two front-and-rear locations of the main body part 29.

The projecting parts 30 are provided as a left-right pair, and the projecting parts 30 of this left-right pair are disposed apart from each other by a predetermined spacing in the left-right direction.

[0023]

On the other hand, an engaging shaft (not shown) to be sandwichingly held between the pair of projecting parts 30 is provided on an intermediate position of the support shaft receiving members 14 of the support plinth 10. This engaging shaft is disposed with its axis oriented in a direction (the front-rear direction) perpendicular to the slide support shafts 27. And, both ends of this engaging shaft are respectively fixed to front and rear wall parts of the support shaft receiving members 14. By the engaging shaft sandwichingly held between the pair of projecting parts 30 as explained above, the support plinth 10 moves in linkage with the oscillation of the oscillating member 26.

In this way, by means of a construction in which the support plinth 10 is connected to the oscillating member 26 by way of an engaging shaft, attachment and removal of the

support plinth 10 to and from the oscillating member 26 is facilitated.

[0024]

The slide support shafts 27 are disposed as a pair spaced to each other in the front-rear direction, and support the oscillating member 26. The slide support shafts 27 are mounted in parallel with the first support shaft 7 and the second support shaft 8, and pass through the through holes 31 in the oscillating member 26. The ends of the slide support shafts 27 are supported by support brackets 32 mounted on the upper faces of the support parts 9, respectively.

As shown in Fig. 7, the main body part 29 is provided with a guide pin 33 downwardly projecting from the underside thereof for engaging the guide member 28. The guide member 28 is formed in a cylindrical shape having an outer circumferential face formed with an endless cam groove 34 for receiving the guide pin 33 which slants with respect to the axis of a guide member axle 37.

[0025]

On the other hand, an engaging ring 35 for engaging with the cam groove 34 is fitted about the guide pin 33, and this engaging ring 35 is rotatable about the axis of the guide pin 33.

The guide member 28 is rotatably supported in an intermediate position of each of the support members 9 by the

guide member axle 37, which is formed to project from both its axial direction ends. The axis of the guide member axle 37 is substantially parallel with the axes of the first support shaft 7 and the second support shaft 8.

And, as shown in Fig. 4, a following gear 38 is mounted on one end of the guide member axle 37. This following gear 38 is driven by a driving gear 39 mounted on one end of the first support shaft 7 (on an end opposite to the end on which the worm gear mechanism 22 is mounted). The ratio of the number of teeth of this driving gear 39 to the number of teeth of the following gear 38 is 1:2.

[0026]

When the first axle 12 is rotated by the above-mentioned electric motor 20 (driving means 3), the first support shaft 7 rotates eccentrically to cause the support plinth 10 to reciprocate in the up-down direction and the front-rear direction. At the same time, the support plinth 10 is caused to reciprocate in the left-right direction (the axial direction of the support shafts or the axial direction of the slide support shafts 27) by the oscillating means 25. At this time, since the ratio of teeth numbers of the driving gear 39 to the following gear 38 is 1:2, while the first support shaft 7 rotates through 2 revolutions, the guide member 28 rotates through 1 revolution. Since the front-rear, up-down and left-right reciprocating motions of the support plinth 10 are

performed simultaneously, when it is seen in plan view, the support plinth 10 oscillates in a direction slanting with respect to the front-rear direction. That is, it reciprocates in the direction of arrow B or C of Fig. 6. The directions of the arrow B, C are at $\theta =$ approximately 45° in the left-right direction.

The axis of the guide member 28 and the axes of the above-mentioned first support shaft 7 and second support shaft 8 are disposed so as to be substantially horizontal.

[0027]

Referring to Fig. 10, an operating mode of the balance fitness machine will be explained.

The balance fitness machine is provided with a remote controller 40 to be remotely controlled. A user H standing on the platform 1 can control ON/OFF-operation of the balance fitness machine and the strength of the rocking movement of the support plinth 10 with the remote controller 40. As shown in Fig. 10, it is very desirable that the controller of the remote controller 40 is formed to be worn on arms like a wristwatch.

[0028]

When the controller of the remote controller 40 is operated to turn ON the balance fitness machine, the rocking mechanism 2 is driven by the driving means 3. Specifically, the electric motor 20 rotationally drives the first axle 12

to cause the first support shaft 7 to rotate eccentrically about an axis oriented in the left-right direction. The second support shaft 8 oscillates forward and rearward about the second axle 13 in correspondence with this rotation of the first support shaft 7.

As a result of the movements of the first support shaft 7 and the second support shaft 8, the support plinth 10 and the platform 1 linked to the support plinth 10 undergo complex reciprocating movements in the front-rear direction and the up-down direction. Further, the platform 1 is reciprocated in the left-right direction by the oscillating means 25 of the rocking mechanism 2.

[0029]

As a result of the above, the platform 1 undergoes a complex rocking motion and the posture of the user H standing on the platform 1 is collapsed due to the rocking motion of the platform 1, thereby causing the user to move his whole body to gain his balance. Consequently, the user can obtain an exercising effect effective in dieting and recovering from back fatigue and the like, and also the user's sense of balance is developed.

Fig. 8 shows a second embodiment of the invention.

In this second embodiment, the attachment structure of the platform 1 to the support plinth 10 is different from that in the first embodiment.

That is, between the extension plate 16 (the support plinth 10) and the platform 1, instead of the connecting member 17, supporting means 45 for supporting the platform 1 so as to allow rocking of the platform 1 with respect to the support plinth 10 are provided.

[0030]

The supporting means 45 has upper projecting arms 46 provided on the underside of the platform 1 at front and rear positions thereof, and lower projecting arms 47 projecting from the upper face of the extension plate 16, and these upper and lower projecting arms 46, 47 are connected to be rotatable about an axis oriented in the front-rear direction.

Further, the supporting means 45 has multiple support members 48 formed of resilient bodies such as coil springs, which are provided on either side of the lower projecting arms 47 in the left-right direction in front view. The upper ends of the support members 48 are connected to the underside of the platform 1, while the lower ends of the support members 48 are connected to the support plinth 10, such that the support members 48 are disposed substantially vertically in the up-down direction.

[0031]

With this construction, the platform 1 is rockable to the left and right (about an axis oriented in the length direction) with respect to the support plinth 10, and when the

platform 1 tilts to the right a force tending to push the platform 1 back to the left side arises in the support members 48, and when the platform 1 tilts to the left a force tending to push the platform 1 back to the right side arises in the support members 48. Consequently, the balance of a user H standing on this platform 1 can be collapsed still more complexly than in the first embodiment.

Fig. 9 shows a third embodiment of the invention.

This embodiment is a variation of the second embodiment, and the attachment positions of the support members 48 are different. That is, the upper ends of the support members 48 are connected to the underside of the platform 1, while the lower ends of the support members 48 are connected to the vicinities of the lower projecting arms 47, such that their configuration forms V shape in plan view.

[0032]

With this construction also, the platform 1 is rockable to the left and right (about an axis oriented in the length direction) with respect to the support plinth 10, and when the platform 1 tilts to the right a force tending to push the platform 1 back to the left side arises in the support members 48, and when the platform 1 tilts to the left a force tending to push the platform 1 back to the right side arises in the support members 48. Consequently, the balance of a user H standing on this platform 1 can be collapsed still more

complexly than in the second embodiment.

The present invention is not limited to the embodiments described above, and the following variations and modifications are possible.

For example, the resilient bodies used for the supporting means 45 are not limited to coil springs, and alternatively, plate springs, air springs, or ones formed of a material such as rubber may be employed. They may also be ones using hydraulic cylinders or the like or reaction forces of magnets.
[0033]

And, the platform 1 is not limited to a long-by-narrow shape, and alternatively, rectangular or circular shape may be employed without any problem.

INDUSTRIAL APPLICABILITY

[0034]

This invention provides a balance fitness machine suitable for obtaining a muscle-exercising effect extending over a whole human body and/or developing the sense of balance of the body. Therefore, the invention can be used in products for providing a muscle-exercising effect extending over a whole human body and/or developing the sense of balance of the body.

CLAIMS

[1] A balance fitness machine comprising:
a platform capable of carrying a user mounting thereon in a standing posture;
a rocking mechanism for rocking the platform in a front-rear, left-right, or up-down direction; and
driving means for driving the rocking mechanism.

[2] A balance fitness machine according to claim 1, wherein the platform has a long-by-narrow shape.

[3] A balance fitness machine according to claim 1, wherein the platform is connected to the rocking mechanism through a supporting member formed of a resilient body.

[4] A balance fitness machine according to any one of claims 1 to 3, wherein the rocking mechanism is disposed below the platform and the driving means is disposed on a side of the rocking mechanism.

[5] A balance fitness machine according to claim 4, wherein the rocking mechanism comprises:
a support plinth on which the platform is mounted;
a first support shaft and a second support shaft that support the support plinth from below; and

a support part that supports the first support shaft and the second support shaft,

the first support shaft having a first axle projecting from both ends in an axial direction thereof for eccentrically rotatably supporting the first support shaft,

the second support shaft having a second axle projecting from both ends in an axial direction thereof for oscillatably supporting the second support shaft,

the first axle and the second axle being supported by the support part horizontally and with a predetermined spacing between them.

[6] A balance fitness machine according to claim 5, wherein the driving means rotationally drives the first axle of the first support shaft of the rocking mechanism.

[7] A balance fitness machine according to claim 6, wherein the rocking mechanism has oscillating means for oscillating the support plinth in the axial direction of the first support shaft,

the oscillating means comprising:

an oscillating member connected to the support plinth;

a slide support shaft disposed along the axial direction of the first support shaft for slidably supporting the oscillating member; and

a guide member for oscillating the oscillating member along the slide support shaft,

the guide member being formed in a cylindrical shape and being rotatable about an axis parallel with the axis of the first support shaft, the guide member having an outer circumferential face formed with a spiral cam groove,

the oscillating member being provided with a guide pin to be slidably fitted in the cam groove.

[8] A balance fitness machine according to claim 6, wherein

the rocking mechanism has oscillating means for oscillating the support plinth in the axial direction of the first support shaft,

the oscillating means comprising:

an oscillating member connected to the support plinth;

a slide support shaft disposed along the axial direction of the first support shaft for slidably supporting the oscillating member; and

a guide member for oscillating the oscillating member along the slide support shaft,

the guide member being formed in a cylindrical shape and being rotatable about an axis parallel with the axis of the first support shaft, the guide member having an outer circumferential face formed with a spiral cam groove,

the oscillating member being provided with a guide pin

to be slidably fitted in the cam groove,

the first axle, the second axle, and the guide member being disposed such as to be horizontally parallel to each other.

[9] A balance fitness machine according to claim 6, wherein the rocking mechanism has oscillating means for oscillating the support plinth in the axial direction of the first support shaft,

the oscillating means comprising:

an oscillating member connected to the support plinth;

a slide support shaft disposed along the axial direction of the first support shaft for slidably supporting the oscillating member; and

a guide member for oscillating the oscillating member along the slide support shaft,

the guide member being formed in a cylindrical shape and being rotatable about an axis parallel with the axis of the first support shaft, the guide member having an outer circumferential face formed with a spiral cam groove,

the oscillating member being provided with a guide pin to be slidably fitted in the cam groove,

the ratio of the rotational speed of the guide member to the rotational speed of the first axle being set as 1:2.