

# United States Patent

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[54] **ENDLESS BELT EXERCISER WITH  
ACCELERATING AND DECELERATING  
TREAD SURFACES**

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[58] Field of Search ..... **272/69**

[56] **References Cited**

**UNITED STATES PATENTS**

1,766,089 6/1930 Wood ..... **272/69**

2,842,365 7/1958 Kelley ..... **11/1**

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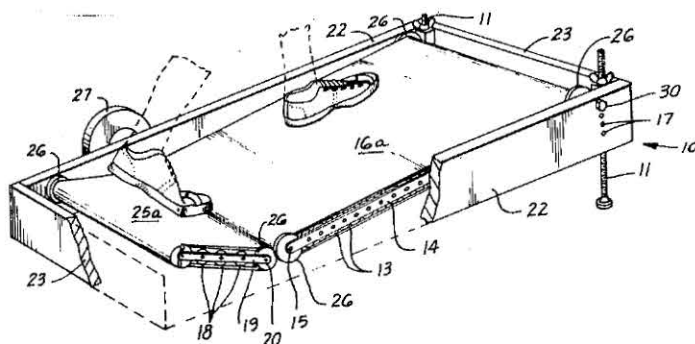
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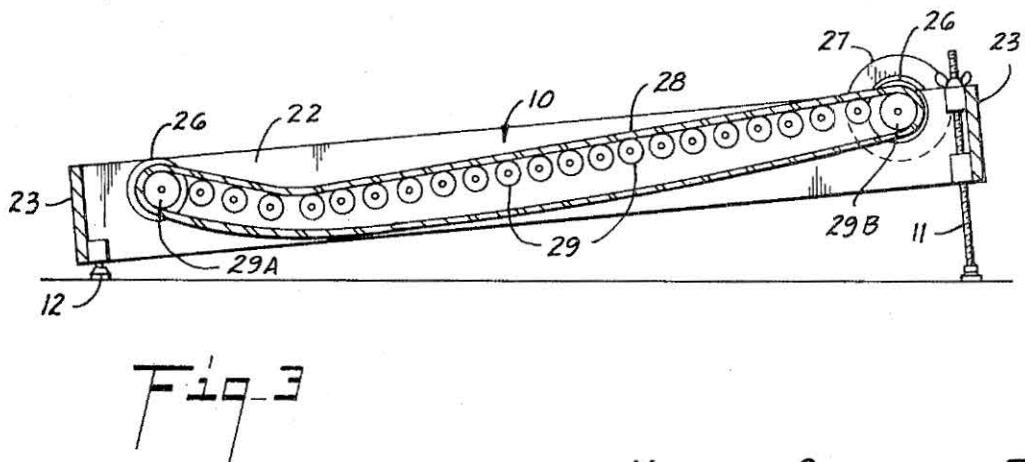
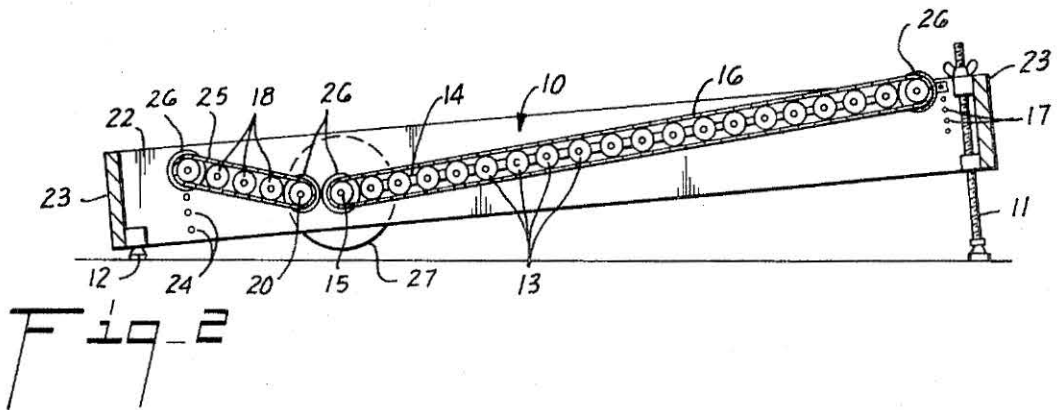
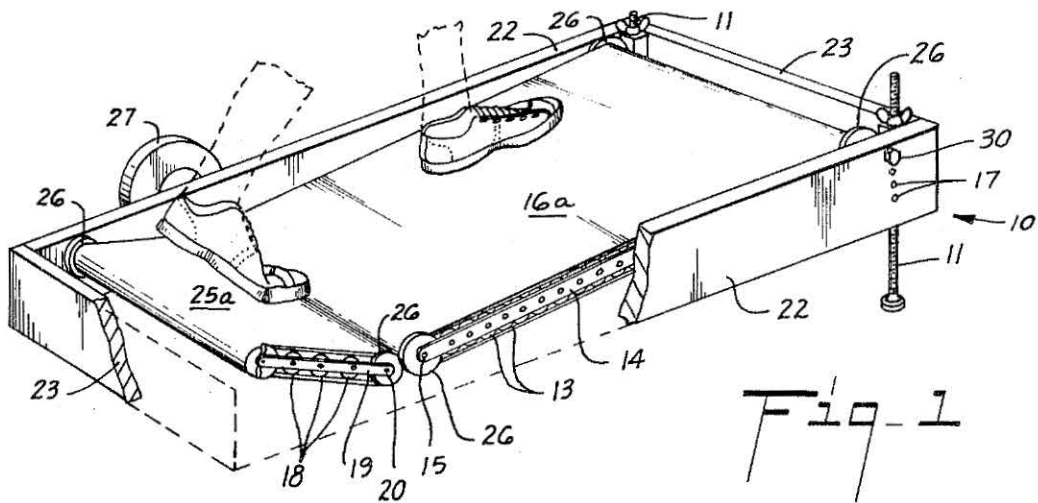
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[57] **ABSTRACT**

This disclosure relates to a new type of treadmill exercising device having a base, rollers carried by the base, and an endless belt disposed about the rollers to provide a tread surface. The tread surface inclines upward toward each end to provide a forward accelerating area and a rear decelerating area. This abstract is not to be construed in any way to define or limit the invention set forth below.

**7 Claims, 3 Drawing Figures**





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# ENDLESS BELT EXERCISER WITH ACCELERATING AND DECELERATING TREAD SURFACES

This invention relates to a new type of treadmill exercising device, and more particularly to an exercising device on which the user can simulate the acts of walking, jogging and running without relying on handles, belts or other external supports for maintaining his balance.

Treadmill-type exercising devices have been known and used for many years. They enable users to enjoy within a confined space many of the beneficial effects of walking, jogging and running exercise. However, a major disadvantage of treadmill exercising devices as heretofore known is that the user must hold onto handles or railings, or use some type of body harness in order to maintain his balance and position. See, for example, the U.S. Pat. Nos. to Schmidt 1,211,765 issued Jan. 9, 1917, to Morairty 759,296 issued May 10, 1904, and to Wood 1,766,809 issued Aug. 6, 1928. The use of such supports decreases the benefits of the exercise to the body as a whole, and also makes the exercise less pleasurable for the user.

In Schmidt, the handles are necessitated by the fact that the tread surface is frictionally mounted so that the user must have some support to push against in order to move the tread with his feet. In Wood and Morairty, which exemplify the more common type of treadmills in general use today, the problem is just the opposite. There the support harness and railings are necessitated by the fact that the tread surface on each device is frictionless—comprising merely an endless belt which is disposed about a series of frictionless rollers on an inclined base. A person exercising on this type of treadmill is likely to lose his balance because the frictionless surface offers no resistance to the movement of his feet, and he is therefore unable to obtain the leverage necessary for proper balance. Also, the user is likely to run off the lower end of the treadmill because the faster he runs the faster the belt accelerates and moves beneath his feet, carrying him to the rear. Thus, some external support is necessary to enable the user of such treadmills to maintain his balance, as well as his position on the moving belt.

It is a principal object of this invention to provide a treadmill type exercising device which removes the necessity for external support means for the user.

Another object is to provide such an exercising device upon which the user may accurately simulate the acts of walking, jogging and running without relying on handles, railings, belts, or the like, for maintaining his balance and his position.

A still further object is to provide such an exercising device which enables the user to more accurately simulate the movements of ordinary walking, jogging and running so as to obtain the greatest possible benefits and pleasure from such exercise.

These and other objects and advantages of the invention will become apparent from the drawing, the specification and claims.

In the accompanying drawing, which illustrates the preferred embodiment of the present invention, and wherein like numerals indicate like parts:

FIG. 1 is an isometric view, with a portion cut away, of an exercising device constructed in accordance with the present invention;

FIG. 2 is a sectional view in side elevation of the exercise device of FIG. 1;

FIG. 3 is a sectional view in side elevation of an alternate form of the exercising device of the present invention.

The preferred form of the exercising device as shown in FIGS. 1 and 2 has a base 10 which comprises an inclined rectangular frame having two sidewalls 22 and two end walls 23. The base may be of any suitable material such as wood or metal. Jackscrews 11 are provided at the forward corners of base 10 for adjusting its angle of inclination. Leveling buttons 12 may be used on the rear corners to keep the base steady.

Antifriction means are carried by the base 10 for supporting an endless belt or belts. These antifriction means preferably comprise transverse parallel rollers. In the embodiment as illustrated in FIGS. 1 and 2 a first and second series of such

transverse parallel rollers are carried by the base preferably as follows: Two elongate support arms 14 are provided, one such arm being pivotally mounted at 15 to the inside of each sidewall 22 of base 10. The forward and free end of each arm 14 is supported by a pin 30 inserted through one of several holes 17 provided in each sidewall 22 near its forward end. Two other similar but preferably shorter support arms 19 are carried by base 10, one arm 19 being pivotally connected at 20 to each sidewall 22 and having its rearward and free end supported by a pin (not shown) inserted through one of several holes 24 provided in each sidewall 22 near its rearward end.

A first series of transverse parallel rollers 13 have their ends journaled in arms 14. An endless belt 16 of some suitable material such as rubber or heavy cloth, is disposed about the series of rollers 13 to provide a first tread surface 16a.

A second series of transverse parallel rollers 18 have their ends journaled in arms 19. An endless belt 25 is disposed about the series of rollers 18 to provide a second tread surface 25a adjacent the first tread surface.

Flanges 26 are preferably provided on at least the first and last rollers in each series for maintaining the belts 16 and 25 in proper alignment. A flywheel 27 is also provided which turns with the rollers 13 to maintain momentum and provide a smoother operation of the rollers 13 and belt 16.

The relative inclinations of the first and second series of rollers 13 and 18, and consequently of the tread surfaces 16a and 25a, to each other and to the horizontal can be adjusted by means of the support pins in holes 17 and 24 and by means of the elevating jackscrews 11. In the operation of the exercising device, the first and second series of rollers 13 and 18, respectively, will be so disposed that the first tread surface 16a will provide an accelerating area inclined downwardly from the forward end of base 10, while the second tread surface 25a provides a decelerating area inclined upwardly toward the rear end of base 10. The upwardly sloping decelerating area offers enough resistance to the user's foot to enable him to maintain his balance and position on the exercising device.

The first series of rollers 13 and tread surface 16a operate much like a conventional treadmill. As a person walks or runs on the tread surface 16a, his weight will cause the rollers 13 and belt 16 to rotate in a counterclockwise motion, carrying the user's foot rearwardly and downwardly. When a faster pace is desired, the inclination of the tread surface 16a is increased by moving pins 30 into one of the upper holes 17, or by elevating the forward end of the base 10 with jackscrews 11, or both. A slower pace is attained by reversing these operations.

When a person is using the exercise device, during each step his foot moves in an approximate arc. The foot first contacts the tread surface 16a as shown in FIG. 1, and moves rearwardly and downwardly, the weight of the person acting to accelerate the motion of the belt 16. Near the bottom of the arc the foot leaves surface 16a and may for a brief instant be out of contact with any surface. However, further rearward movement will bring at least a portion of the foot into contact with tread surface 25a. While the forward rollers and belt may act as an ordinary treadmill, the rear rollers and belt act in exactly the opposite manner since the foot-engaging surface 25a must move upwardly against the force of gravity. This absorbs part of the momentum imparted during the downward movement and tends to decelerate the foot. Also, the surface 25a, due to its upward inclination, will support a forward component of force which enables the person using the exercise device to "push off" against surface 25a at the end of each step. These combined decelerating and forward force-supporting characteristics of surface 25a enable a user of the device to both overcome the rearward motion and momentum imparted to his body during the first part of each step, and also to gain enough forward push to maintain his balance and position.

An alternate form of the exercising device of the present invention is shown in FIG. 3, wherein a single endless belt 28 forms both the accelerating and decelerating areas. In the

device shown in FIG. 3, a single series of rollers 29 are provided journaled in the sidewalls 22 of base 10. However, the rollers are so disposed that the forward rollers lie approximately in a plane slanting downwardly from the front of the base, while the rear rollers lie approximately in a plane slanting upward toward the rear of the base 10. Thus, when the endless belt 28 is placed about the rollers, it follows their contour and provides a forward accelerating area and a rear decelerating area which are inclined from the horizontal with each being lowest at their point of nearest proximity.

When a single belt is used, it may be necessary to use heavier belting material so that the belt will lie flat upon the rollers without being under tension. When such heavier belting material is used, it may also be desirable to provide larger end rollers as at 29a and 29b to give a larger turning radius for the belt. These larger end rollers could, of course, be used on the two-belt model as well as the single-belt model.

While the present invention can be embodied in an exercise device having either one or two endless belts, the two-belt form may be preferable for several reasons. The one-belt model requires a fairly heavy belt since the belt must remain in contact with the rollers due to its weight alone. With the two-belt model, the belts may be under tension and a much lighter and less expensive belt may be used with satisfactory results. Also with the two-belt model the rear belt and rear series of rollers move only as the exercisor's foot pushes against them. They will then tend to slow down or stop before the next foot comes into engagement. This cyclic-operating characteristic enables the rear belt and rollers to absorb more momentum since they must be accelerated by each foot coming into contact with the rear belt. Thus, the rear belt may move at a slower or intermittent pace, while the forward belt, with its associated flywheel, moves at a faster, more constant pace. One further advantage is that with the two-belt model the inclination of the decelerating area may be adjusted independently of that of the accelerating area.

While the exercising device is usable without external supports such as handles, railings and the like, such supports may be provided, if desired, without departing from the spirit of the invention.

The foregoing disclosure and description of the invention is illustrative and explanatory thereof, and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. An exercising device comprising:

a base,

a first antifriction means carried by said base,

an endless belt disposed about said first antifriction means to provide a first tread surface,

a second antifriction means carried by said base adjacent said first means,

another endless belt disposed about said second antifriction means to provide a second tread surface,

said endless belts being so disposed that said first and second tread surfaces provide, respectively, an accelerating area which tends to prevent a user from running off the front end and a decelerating area which tends to prevent a user from running off the rear end.

2. An exercising device according to claim 1, wherein said accelerating and decelerating areas are inclined from the horizontal each being lowest at their point of nearest proximity.

3. An exercising device according to claim 1, wherein means are provided for adjusting the inclinations of said accelerating and decelerating areas.

4. An exercising device according to claim 1, wherein said first antifriction means comprises a first series of transverse parallel rollers and said second antifriction means comprises a second series of transverse parallel rollers.

5. An exercising device according to claim 4, wherein at least the first and last rollers in each series have flanges for maintaining said endless belts in proper alignment.

6. An exercising device comprising:

a base,

a plurality of rollers comprising forward and rear rollers carried by said base,

said forward rollers lying approximately in a plane slanting downwardly from the front of the base,

said rear rollers lying approximately in a plane slanting upwardly toward the rear of said base,

an endless belt disposed about and lying upon said rollers to provide a tread surface,

the portion of said tread surface overlying said forward rollers providing a forward accelerating area which tends to prevent a user from running off the front end of said exercising device, and

the portion of said tread surface overlying the rear rollers providing a rear decelerating area which tends to prevent a user from running off the rear end of said exercising device.

7. An exercising device according to claim 6, wherein said base comprises an inclined frame together with means for adjusting its angle of inclination.

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