

[54] **EXERCISE DEVICE**
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 76448
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 267/41

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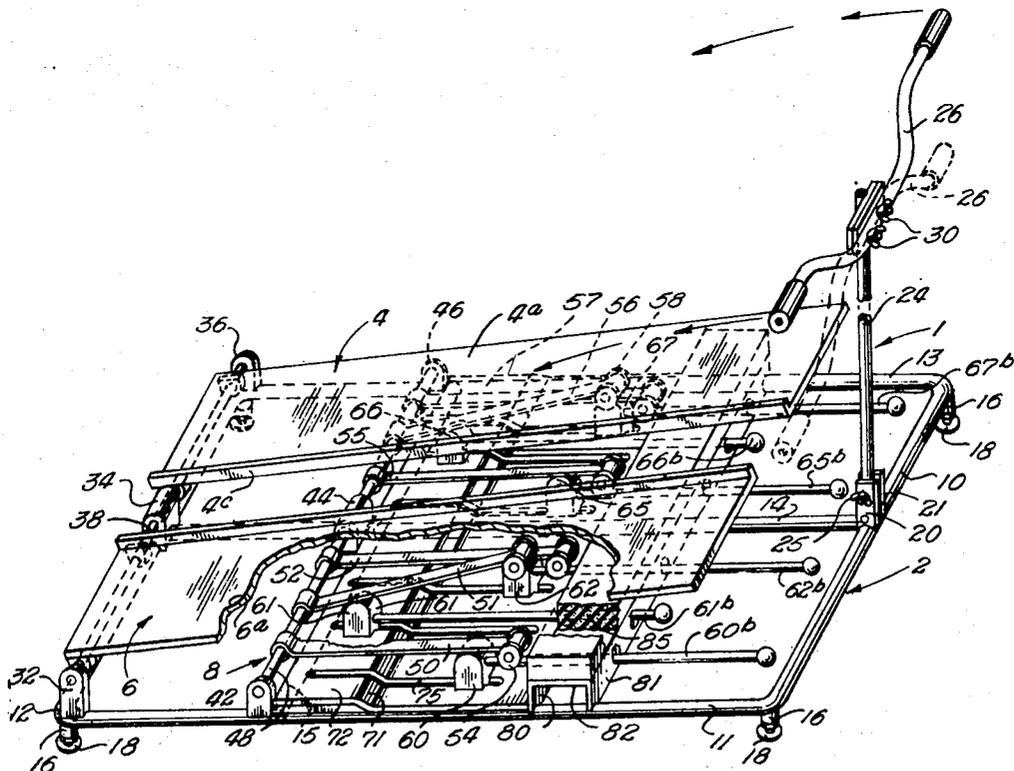
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[57] **ABSTRACT**

An exercise device comprising spaced pedals pivotally secured to a support shaft and resiliently urged upwardly by spring elements. One or more of a plurality of spring elements can be moved into engagement with the pedals to control the resultant spring constant and consequently the force resisting movement of the pedals.

6 Claims, 4 Drawing Figures



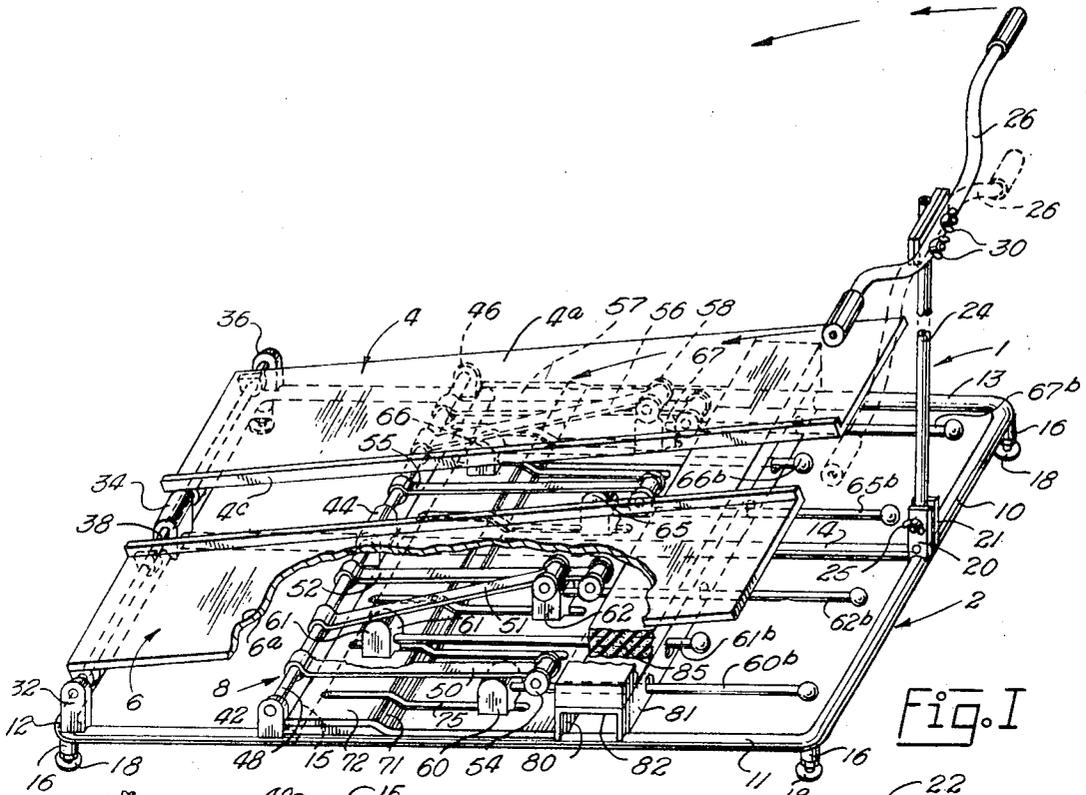


Fig. I

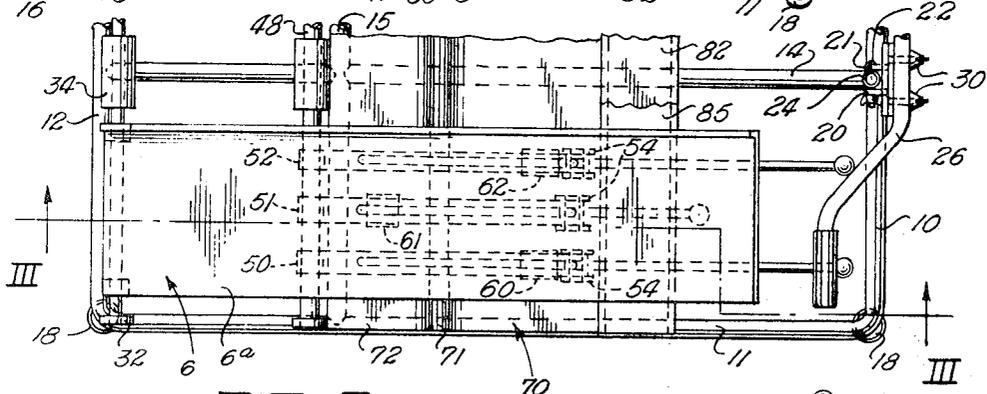


Fig. II

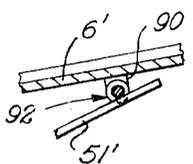


Fig. IV

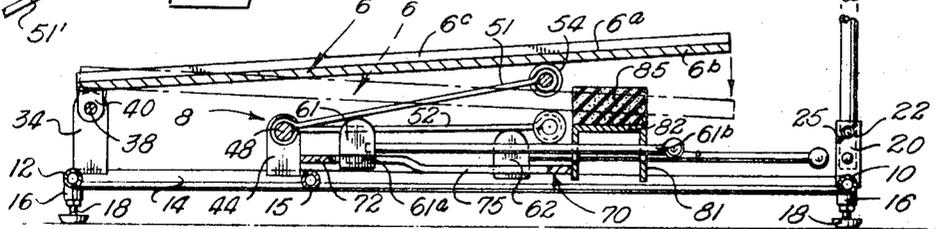
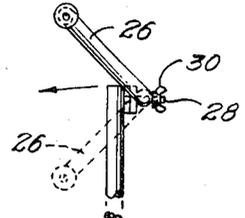


Fig. III

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EXERCISE DEVICE

BACKGROUND OF INVENTION

Paralysis resulting from an apoplectic seizure can often be overcome if the patient engages in a controlled exercising schedule. The paralysis at first is generally complete involving loss of motor power of muscles on one side of the body with power slowly returning to the muscles over a period of time.

In limb rehabilitation exercise programs, therapists often prescribe exercises with resistance gradually increasing daily as muscles regain strength.

Heretofore persons suffering from apoplectic seizures or strokes have been urged by therapists to attempt stationary jogging exercises and cycling exercises while attempting to strengthen and regain control of muscles. However, jogging exercises are difficult to accomplish since muscles may not have sufficient strength to support the weight of the body of the patient.

SUMMARY OF INVENTION

I have devised an exercise device particularly adapted for therapeutic exercising of leg muscles. The device comprises spaced pedals arranged such that a patient stands with one foot on each pedal while retaining his balance by grasping handle bars.

A plurality of spring elements are pivotally secured below each pedal and each spring is individually actuated by movement of a fulcrum such that the spring engages the lower surface of the pedal to exert force on the pedal resisting downward movement thereof. By moving various combinations of springs into engagement with the pedals, the spring constant of the resistive force can be varied to provide a prescribed resistance which can be increased periodically in small increments as muscular development of the patient progresses.

A primary object of the invention is to provide an exercise device for therapeutic use particularly adapted to strengthen legs, ankles, and hips.

Another object of the invention is to provide an exercise device permitting movement of legs in a simulated jogging movement wherein resistive force is controlled such that leg muscles do not support the entire weight of the body of the patient.

Another object of the invention is to provide an exercise device to provide controlled variable resistance to movement of the legs.

A further object of the invention is to provide an exercise device which is portable, compact and inexpensive to manufacture making use thereof convenient and economically feasible.

Other and further objects of the invention will become apparent upon referring to the detailed description hereinafter following and to the drawings annexed hereto.

DESCRIPTION OF DRAWINGS

Drawings of a preferred embodiment of the invention are annexed hereto so that the invention may be better and more fully understood, in which:

FIG. I is a perspective view of the exercise device, parts being broken away to more clearly illustrate details of construction;

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FIG. II is a fragmentary plan view of the apparatus illustrated in FIG. I;

FIG. III is a cross-sectional view taken along lines III-III of FIG. II; and

FIG. IV is a fragmentary cross-sectional view illustrating a modified form of anti-friction means.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. I of the drawing, the numeral 1 generally designates an exercise device comprising a base 2 having pedals 4 and 6 pivotally secured thereto urged upwardly by adjustable resistive force exerting means generally designated by numeral 8.

Base 2 preferably comprises tubular members 10, 11, 12 and 13 secured together to form a rectangular frame. Tubular members 10, 11, 12 and 13 preferably comprise a unitary member bent into a rectangular configuration having opposite ends secured together by suitable means such as welding.

Suitable cross braces such as longitudinal extending member 14 and transversely extending member 15 are employed to provide structural rigidity to the base 2.

Base 2 preferably has downward extending internally threaded legs 16 secured thereto forming a socket to receive externally threaded levelling screw support elements 18.

Lugs 20 and 21 have lower ends welded or otherwise secured to a central portion of tubular member 10 and have apertures extending therethrough to receive a bolt 22 extending through an aperture in the lower end of post 24 and secured in position by wing nut 25.

The upper end of post 24 has handlebars 26 secured thereto by suitable means such as a bolt 28 and wing nut 30. It should be readily apparent that the particular embodiment of the handlebar assembly 26 illustrated in FIG. III of the drawing permits loosening of wing nut 30 allowing handlebars 26 to be moved to the position illustrated in dashed outline.

Bearing means such as lugs 32, 34, and 36 are secured to base member 2 and have apertures extending therethrough into which shaft 38 extends.

As best illustrated in FIG. III, each of the pedals 4 and 6 has downwardly extending lugs 40 secured to the lower side thereof each of which has an aperture formed therein through which shaft 38 extends.

Pedal 4 has an upper surface 4a, a lower surface 4b and an upward extending ledge 4c secured adjacent the inner edge thereof. Pedal 6 has an upper surface 6a, a lower surface 6b and a ledge 6c extending along the inner edge thereof.

As best illustrated in FIG. I bearings 42, 44, and 46 are secured intermediate opposite ends of tubular members 11, 14 and 13, respectively and have apertures formed therein through which shaft 48 extends.

Elongated resilient lever elements or springs 50, 51, and 52 are pivotally secured to shaft 48 and have roller elements 54 on the outer end thereof positionable in engagement with the lower surface 6b of pedal 6. Elongated resilient lever elements or springs 55, 56, and 57 have ends pivotally secured to shaft 48 and have rollers 58 rotatably secured to outer ends thereof positionably in engagement with the lower surface 4b of pedal 4.

Fulcrum or support blocks 60, 61, and 62 are employed for movement of spring elements 50, 51, and 52, respectively, into engagement with pedal 6 as will

be hereinafter more fully explained. Fulcrum blocks 65, 66, and 67 are employed for moving rollers 58 on ends of spring elements 55, 56 and 58, respectively, into engagement with lower surface 4b of pedal 4.

A mounting plate 70 rests upon longitudinally extending member 14 and has opposite ends secured to tubular members 11 and 13. Mounting plate 70 has a deflected central portion 71 forming an elevated platform 72.

Each of the fulcrum blocks 60, 61, 62, 65, 66, 67 has a downwardly extending tongue along the lower side thereof which is slidably disposed in slots 75 formed in mounting plate 70.

Each of the fulcrum blocks is of identical construction. As best illustrated in FIG. III fulcrum block 61 is movable longitudinally of slot 75 by exerting external force on rod 61b extending through apertures in flanges 80 and 81 of a channel member having a web portion 82.

The web portion 82 of the channel member has a resilient bumper 85 extending therealong to cushion impact of the lower surface of pedals 4 and 6.

A modified form of the anti-friction means between the spring elements and the pedals is illustrated in FIG. IV.

In the modified form of the apparatus downwardly extending lugs 90 are secured adjacent opposite edges of pedals, 4' and 6' and have apertures extending there-through in which rollers 92 are mounted. Rollers 92 preferably have spaced annular grooves formed along the length thereof into which spring elements 50-56 extend.

The operation and function of the apparatus heretofore described is as follows:

Resistive force exerted upwardly on each of the pedals 4 and 6 is controlled by moving a desired number of fulcrum blocks along slots 75 onto the elevated platform portion 72 of mounting plate 70.

As illustrated in FIG. I, fulcrum blocks 61 and 66 engage springs 51 and 56 respectively moving outer ends of the springs upwardly into engagement with the lower surfaces of pedal 6 and 4. Thus, only springs 61 and 66 exert forces upon the pedals.

To increase the resistive force one or more additional springs may be moved into engagement with the lower surface of the pedals by moving additional fulcrum blocks onto the elevated platform 72.

To operate the apparatus hands are placed upon handle bars 26 and one foot is positioned on each of the pedals 4 and 6 moving the lower surfaces of the pedals downwardly into engagement with resilient bumper 85.

As first one foot and then the other is raised and lowered pedals 4 and 6 pivot about shaft 38 partially supporting the weight of the body.

As the strength of leg muscles increases resistive force may be increased by moving additional fulcrum blocks upon the elevated platform 72 to increase resistive force exerted on pedals 4 and 6.

tive force exerted on pedals 4 and 6.

It should be appreciated that while three fulcrum blocks are illustrated positionable for engagement with three springs under each of the pedals, any desired number of springs and fulcrum blocks associated therewith may be employed to provide the desired degree of adjustment of resistive force.

It should further be appreciated that springs 50, 51 and 52 may have equal spring constants or different spring constants as desired.

While a preferred embodiment of the invention has been described and illustrated in the attached drawings, it should be appreciated that other and further embodiments of the invention may be devised without departing from the basic concept thereof.

Having described my invention I claim:

1. Exercise apparatus comprising, support means; first and second pedals; means to pivotally secure an end of each of said pedals to said support means; a plurality of resilient elements; means to pivotally secure each of said resilient elements to said support means; and means engageable with said resilient elements intermediate opposite ends to move ends of said resilient elements between a first position in engagement with at least one of said pedals, and a second position disengaged from each of said pedals.

2. The combination called for in claim 1 wherein each of said resilient elements comprises, a spring.

3. The combination called for in claim 2 wherein each of said springs comprises an elongated resilient element.

4. The combination called for in claim 3 wherein the means to secure each of the elongated resilient spring elements to the support means comprises, a shaft; means to secure the shaft to the support means; and means to pivotally secure an end of each of said spring elements to said shaft.

5. The combination called for in claim 1 with the addition of a handle bar; and means to secure the handle bar to the frame.

6. Exercise apparatus comprising, support means; first and second pedals; means to pivotally secure an end of each of said pedals to said support means; a plurality of elongated resilient lever elements; means to pivotally secure an end of each of said elongated resilient lever elements to said support means; a support block associated with each of said elongated resilient lever elements; means to movably secure each of said support blocks to said support means; and means to move each of said support blocks between a first position in engagement with a central portion of one of said elongated resilient lever elements wherein an end of said lever element is in engagement with at least one of said pedals, and a second position wherein the end of the lever element is disengaged from each of said pedals.

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