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Philbin

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[54] **PEDAL ACTUATED EXERCISING DEVICE WITH ADJUSTABLE LOAD CONTROL**

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[52] **U.S. Cl.** ..... **272/73,** 188/77 R

[51] **Int. Cl.** **A63b 23/04**

[58] **Field of Search** ..... 272/73, DIG. 3; 188/65.1, 188/65.4; 242/156, 156.2, 75.4; 254/156

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[57] **ABSTRACT**

An exercising device having a stationary frame assembly with handlebars and a seat so as to generally resemble a conventional bicycle, has a rotatable wheel actuated by pedals and a friction belt engaging a portion of the wheel for applying a braking load on the wheel. A load control mechanism is manually operated between positions for varying the load applied by the belt and a retainer device acting on the load control mechanism precludes an inadvertent and/or actual movement thereof from its set controlling position.

11 Claims, 6 Drawing Figures

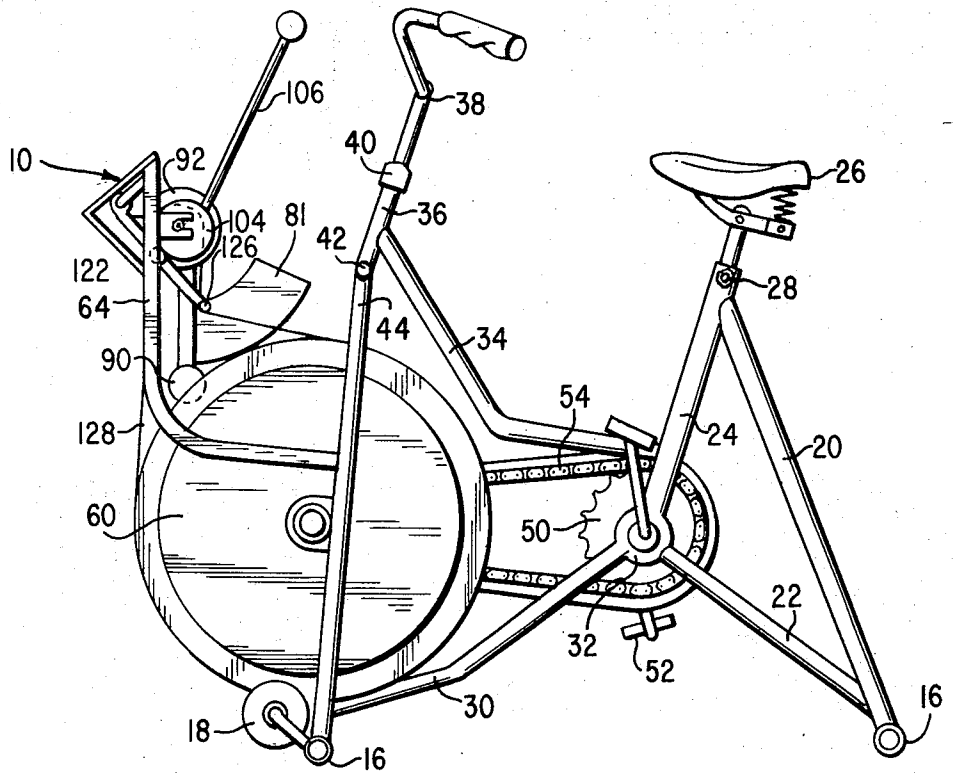


FIG. 1

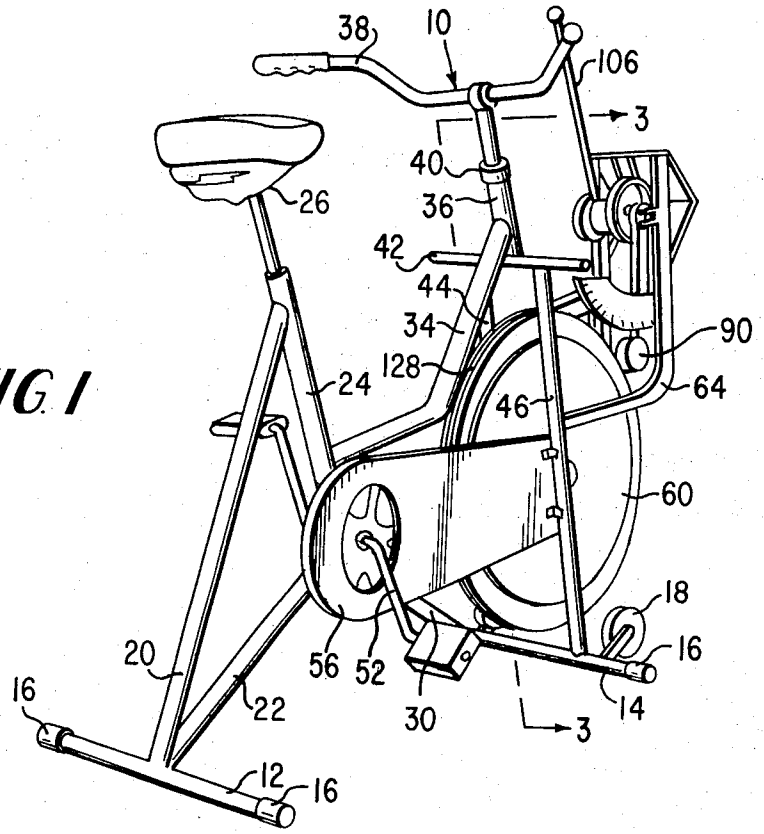
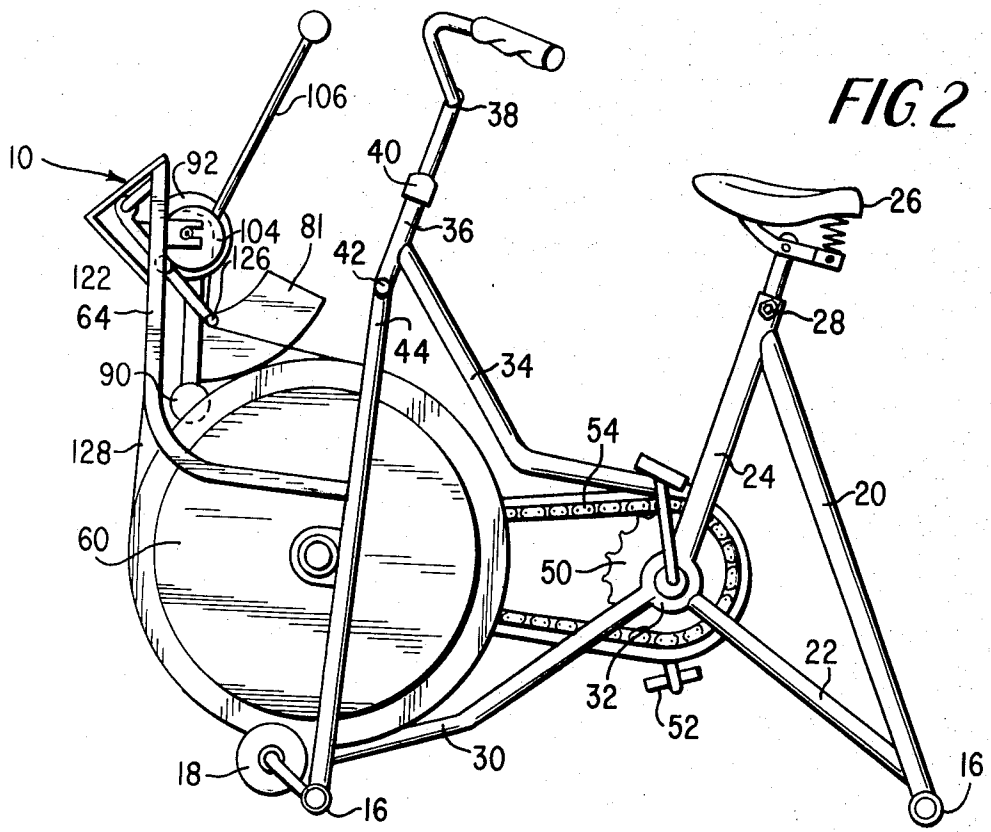

38
10
106
3
40
26
36
42
44
34
90
128
24
46
64
60
18
16
20
56
52
30
3
14
16
22
12
16

FIG. 2


106
38
10
92
40
26
104
81
126
36
42
122
64
28
44
34
90
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128
24
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60
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32
52
18
30
16
16

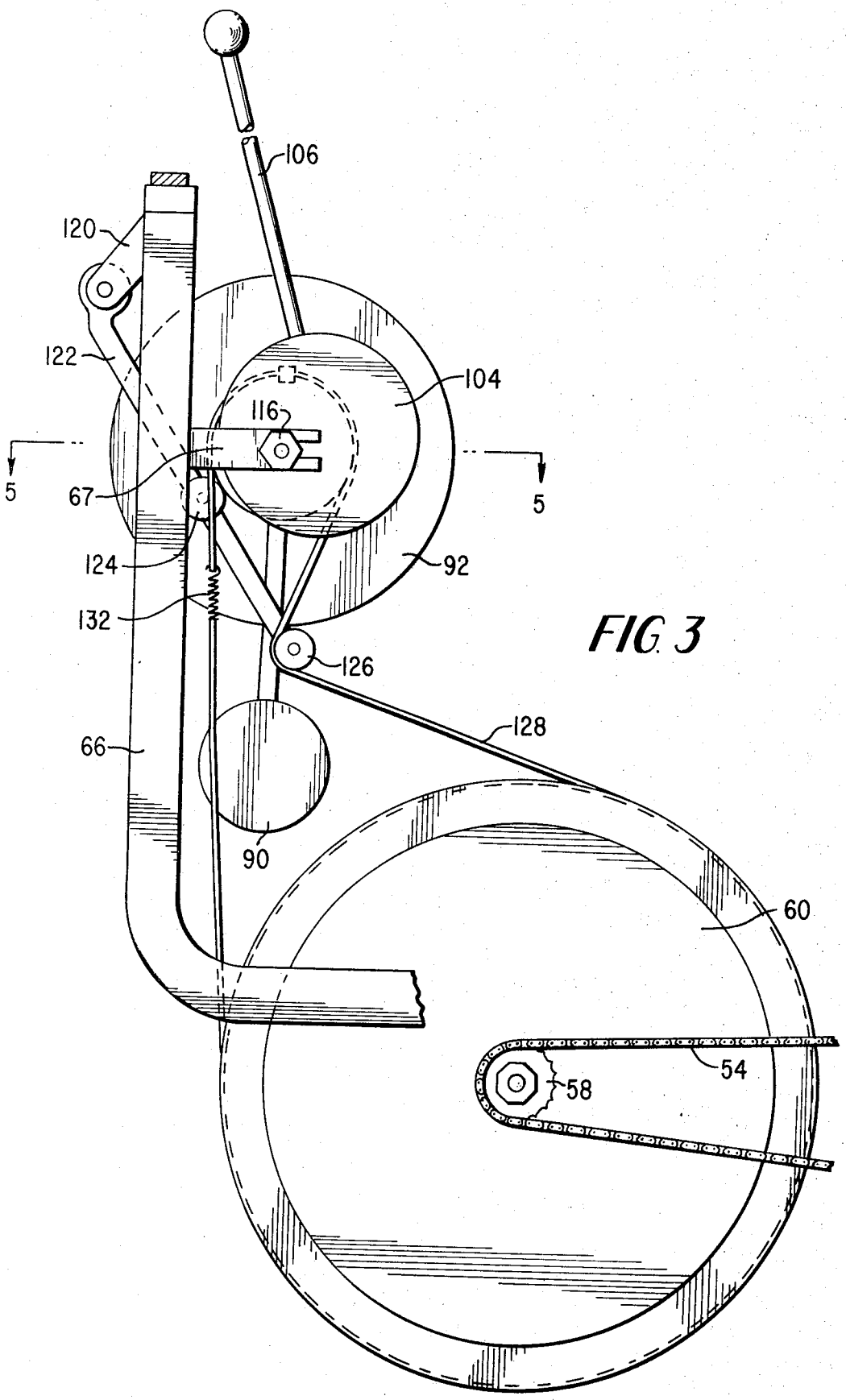


FIG 3

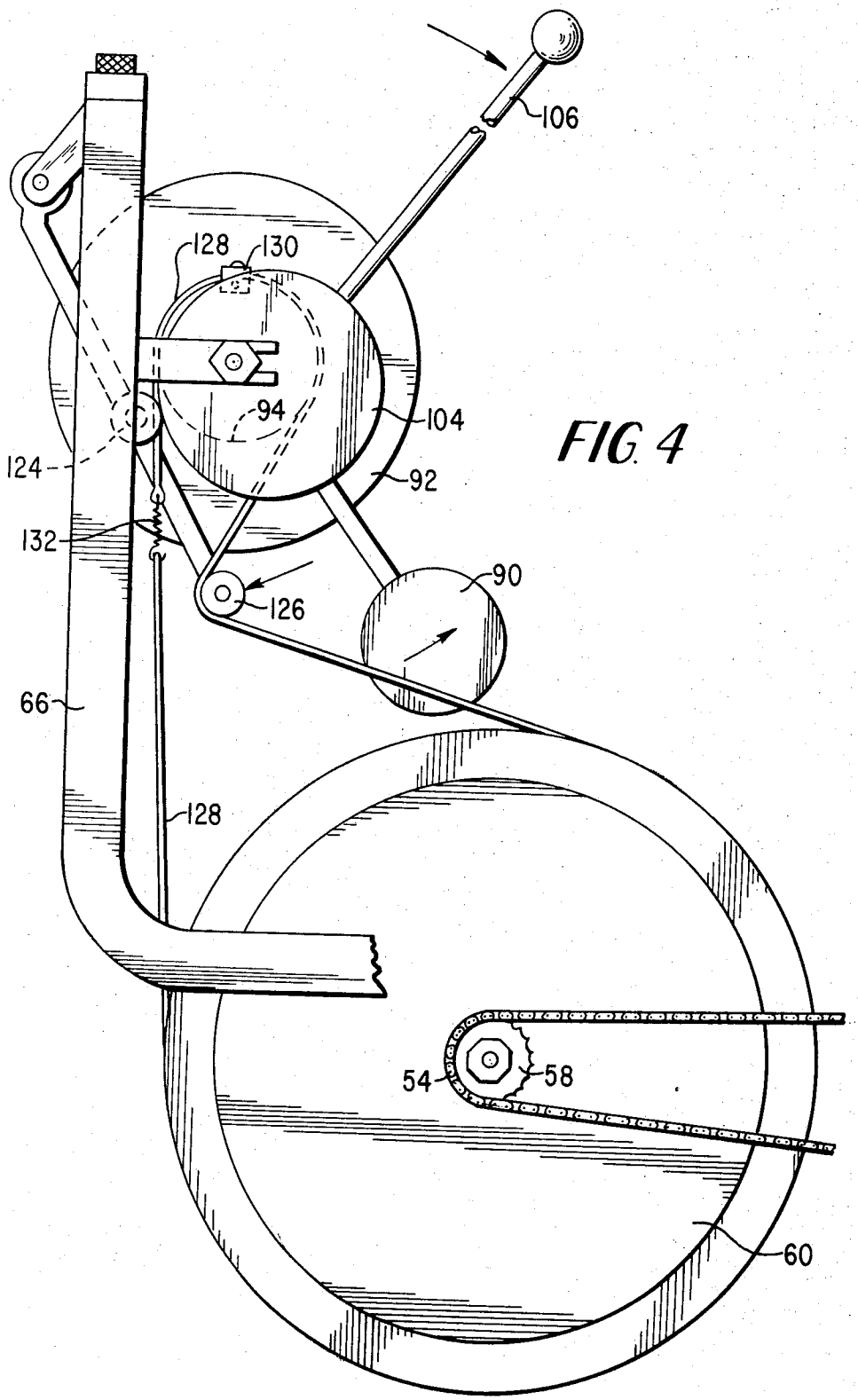


FIG. 4

FIG. 5

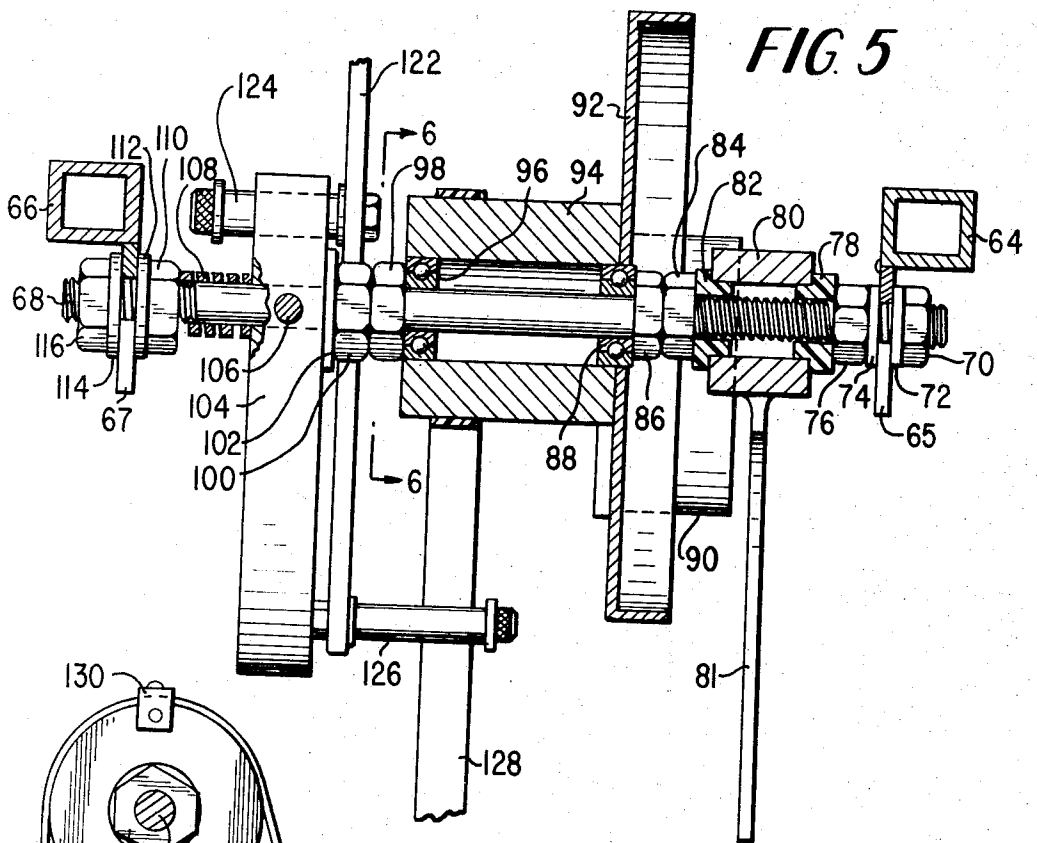

124
122
92
6
112
110
108
98
96
94
84
82
80
78
64
66
68
116
114
67
106
104
102
100
6
88
86
76
74
72
70
65
90
126
128
81
130
68
98
94
128
132
122
126

FIG. 6

PEDAL ACTUATED EXERCISING DEVICE WITH ADJUSTABLE LOAD CONTROL

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an exercising device and in particular to such an exercising device of the type generally resembling a stationary bicycle.

2. Description of the Prior Art

The prior art is generally cognizant of a wide variety of bicycle-type exercising devices such as is found in gymnasiums, health spas, hospitals, rehabilitation centers, etc. While the prior art devices have proven to be fairly satisfactory for their particular requirements, the use of such devices has been unsatisfactory where certain requirements include the need of a constant load to be applied for a specific exercise.

With bicycle-type exercising devices of the prior art, there exists a problem with respect to the setting and fixing of the load to be applied to the rotatable wheel. This problem exists because the mechanisms for preloading the rotatable wheel have always used gears, chain drives, friction drives, etc., but such mechanisms were not capable of precluding movement from a preset position and they did not include any arrangement for positively locking or retaining the load control device in a particular position.

SUMMARY OF THE INVENTION

The present invention is summarized in that an exercising device includes a stationary frame assembly having handlebars and a seat, a rotatable wheel carried by the frame assembly, a pedal-actuated drive for rotating the wheel, a belt engaging a portion of the wheel for placing a load thereon, load control means engaging the belt for varying the load applied thereby to the wheel, and means retaining the load control means in a predetermined adjusted position whereby the belt applies a predetermined fixed load corresponding to the predetermined adjusted position.

It is an object of the present invention to set and fix a load on a bicycle-type exercising device.

Another object of this invention is to eliminate slippage of the control which loads a bicycle-type exercising device.

The present invention has another object in that the load controlling arrangement of a bicycle-type exercising device is precluded from actual movement from its preset control position.

This invention has a further object in that a clutch spring biases the load control mechanism of an exercising device in its selected position.

Still another object of the present invention is to contruct a bicycle-type exercising device that may be used by cardiac patients without the danger of overstrain on such a patient.

It is yet another object of the present invention to construct a bicycle-type exercising device in a simple and economical manner without complex control and/or operating mechanisms.

Other objects and advantages of the present invention will become apparent from the following description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of an exercising device embodying the present invention;

FIG. **2** is a side elevation view looking from the left of FIG. **1**;

FIG. **3** is a partial side elevation view taken along the line **3—3** of FIG. **1**;

FIG. **4** is a partial side elevation view similar to FIG. **3** but showing certain components in different operating positions;

FIG. **5** is an enlarged partial cross-sectional view taken along line **5—5** of FIG. **3**; and

FIG. **6** is a partial cross-sectional view taken along line **6—6** of FIG. **5**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

An exercising device embodying the present invention is illustrated as a bicycle ergometer, indicated generally at **10**, in FIGS. **1** and **2**, is self-supporting by means of a pair of spaced surface engaging base tubes **12** and **14**, the ends of which receive surface bumpers **16** made of rubber or the like to preclude slippage and/or marring between the surface and the tubes **12** and **14**. A pair of spaced rollers **18** angularly and upwardly extend from the front basetube **14** so as to be out of surface engagement; manually tilting and holding the rear of the exerciser **10** until the front rollers **18** engage the surface facilitates movement of the exerciser **10**.

These tubular frame elements **20, 22** and **24** are integrated as a unit in generally triangular outline with frame elements **20** and **22** being joined to the rear base tube **12**; the other end of frame element **20** is joined to the frame element **24** adjacent its ends which receives the shaft of a bicycle seat assembly **26** for adjustably supporting the same by any suitable means such as a conventional pin and bore arrangement **28** (FIG. **2**). Another tubular frame element **30** has a forward end joined to the central portion of the front base tube **14** and a rearward end integrated as a unit with adjacent ends of frame elements **22** and **24** to form a sprocket mounting **32**. A tubular frame element **34** is bent intermediate its ends with one end joined to the frame element **24** at a point located slightly above the sprocket mounting **34**; the other end of frame element **34** inclines upwardly toward and is joined to an intermediate portion of a tubular neck **36**.

One end of the tubular neck **36** receives the shaft of a handlebar assembly **38** for adjustably supporting the same by any suitable means such as a conventional friction collar **40** and/or a conventional pin and bore arrangement **28**. The other end of the tubular neck **36** is joined to a central portion of a cross bar or tube **42** from which a pair of tubular frame elements **44–46** extend in a manner similar to a bicycle fork toward the front base tube **14** to which they are joined intermediate the ends of such base tube **14**.

The tubular components **12, 14, 20, 22, 24, 30, 32, 34, 36, 42, 44** and **46** may be of any suitable cross section, such as square, circular, polygonal, etc., or any combination of such cross sections to be compatible with strength and appearance. In addition, such tubular components are joined to each other by any suitable means, such as welding, to constitute a stationary, integral frame assembly in a manner much like the frame unit of a conventional bicycle.

As is shown in FIG. 2, a chain sprocket 50 is rotatably carried in the sprocket mount 32 with a crank and pedal assembly 52 extending from the sprocket 50 as is well known in the art. An endless drive chain 54 extends under a guide cover 56 between the sprocket 50 and a toothed wheel 58 (FIG. 3) which is fixed to a large wheel 60 for rotating the same whenever the pedal assembly 52 is operated. The wheel 60 is made of any suitable light-weight material, such as aluminum, and together with the toothed wheel 58 is rotatably carried on a journal bearing or axle 62 that is clamped or otherwise secured to the fork elements 44 and 46 and is fixed thereto at a location so that the wheel 60 does not touch the surface.

The aluminum wheel 60 is also straddled by a pair of L-shaped supporting brackets 64 and 66 being secured to and extending from the fork elements 44 and 46, respectively. Bifurcated arms 65 and 67 project from the brackets 64 and 66, respectively, to define a mounting for a shaft 68.

As is viewed in FIG. 5, the right end of the shaft 68 is threaded for attachment to the bifurcated arm 65 by means of a threaded nut 70 and washer 72 on one side of the arm 65 and a similar washer 74 and threaded nut 76 on the opposite side. A plastic bearing 78 abuts the nut 76 and carries one end of an indicator bushing 80, the other end of which is carried by a second plastic bearing 82; a threaded nut 84 abuts the bearing 82 to longitudinally position the bearings 78–82 and the bushing 80 on the shaft 68. Adjacent the nut 84 is a threaded nut 86 which positions a ball bearing 88 on the shaft 68. A pendulum weight 90 suspends from a mounting plate 92 which is fixed to one end of a cylindrical drum 94; the plate 92 and drum 94 oscillate as a unit on a ball bearing assembly that includes the first bearing 88 and a second spaced bearing 96 and that is longitudinally positioned on the shaft 68 by a threaded nut 98.

A threaded nut 100 abuts the nut 98 and with a washer 102 longitudinally positions an eccentric disc 104 on the shaft 68. A handle 106 projects from the eccentric disc 104 for manually oscillating and positioning the disc 104. A coil spring 108 encircles the shaft 68 and is mounted in compression between the disc 104 and a threaded nut 110 which engages a washer 112 that abuts the outside of the arm 67; a washer 114 abuts the other side of arm 67 and is fixed thereagainst by a threaded nut 116 on the left end of shaft 68 as viewed in FIG. 5. The coil spring 108 has a generally squared shape cross section and each end of the coil is tapered to present larger surface areas engaging the adjacent surfaces of the disc 104 and nut 110. The assembly mounted on the top portions of brackets 64 and 66 is forwardly covered by a hood.

A pivot support 120 is shown in FIG. 3 extending from the upper end of the bracket 66 and an idler arm 122 has one end partially attached to the support 120. A cam follower 124 is fixed to an intermediate portion of the idler arm 122 and projects transversely therefrom (FIG. 5) so as to be in the path of and moved by the eccentric disc 104. From the lower end of the idler arm 122, an idler roller 126 projects transversely but in a direction opposite to that of the cam follower 124. As is shown in FIGS. 3, 4 and 6, band or flexible belt 128, made of Nylon or any other suitable material, encircles the major portion of the wheel 60 as by engaging the recessed rim thereof; from the wheel 60, the belt 128 is threaded clockwise partially around the idler arm 126 and counterclockwise partially around the winding drum 94, to which it is secured as by any suitable fastener, such as a bolted clip 130. The belt 128 extends from the drum 94 to the wheel 60 and intermediate such extension has a coil spring 132 mounted in tension between severed ends of the belt 128 which is thereby maintained in tension.

During operation of the exercising device 10, a person is seated on the bicycle seat 26 with hands engaging the handlebar assembly 38 and with feet on the pedal assembly 52. The operation is commenced without any load with the person rotating the pedal assembly and causing the drive chain 54 to rotate the aluminum wheel 60; at this time there is no external load applied to the aluminum wheel because the manual handle 106 is in its zero load position. FIG. 3 represents the relative positions of the components during the zero load condition; i.e., manual handle 106 is forward, the cam follower 124 is not in engagement with the periphery of the eccentric disc 104, and the idler roller 126 is in its forward position as viewed in FIG. 3. Thus, the flexible belt 28 is not loading the aluminum wheel 60.

While rotating the pedals, the person moves the manual handle 106 to a selected clockwise position as viewed in FIG. 4, which position is illustrated by the pendulum weight 90 along the adjacent indicator scale. The eccentric disc 104 is similarly rotated clockwise causing displacement of the cam follower 124 which in turn effects clockwise movement of the idler arm 122 about its upper pivot resulting in clockwise displacement of the idler roller 126. By displacing a portion of the flexible belt 128 from its position in FIG. 3 to its position in FIG. 4, the tension of the belt 128 is increased and the load applied to the aluminum wheel 60 is likewise increased. Because of the force exerted by the clutch spring 108 the eccentric disc 104 will remain in any set position. The increased tension on the flexible belt 128 causes rotation of the winding drum 94 in a counterclockwise direction as viewed in FIG. 4 whereupon the plate 92 and the pendulum weight 90, which rotate as a unit with the drum 94 are similarly displaced counterclockwise.

The load placed on the rotating aluminum wheel 60 by the flexible belt 128 may be adjusted through an infinitely variable arrangement since movement of the manual handle 106 causes the idler arm 122 to vary the position of the idler roller 126. Even during such adjustments the coil spring 132 (see FIG. 6) assures that the flexible belt 128 will remain in tension.

In the rehabilitation of cardiac patients it is important that the proper exercise be obtained and it is likewise important that overexertion be avoided. Thus the cardiac patient can undertake an exercising program with the present invention and be assured that the exercising device will not vary from its set position. While the indicator plate 81 may be provided with any suitable scale to indicate the work load, it has become conventional to utilize a scale in the form of power such as watts, foot pounds per minute or equivalents in the metric system.

Inasmuch as the present invention is subject to many changes in detail, variations and modifications, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An exercising device, the combination comprising

a stationary frame assembly having handlebars and seating means,

a rotatable wheel carried by said frame assembly,

pedal actuated means for rotating said wheel,

belt means engaging a portion of said wheel for placing a load thereon,

load control means adjustably carried by said frame assembly and engaging said belt means for varying the load applied thereby to said wheel,

said load control means comprising a member engaging said belt means and a manually movable element including an eccentric disc for positioning said member in response to movement of said manually movable element, and

retaining means biasing said disc and retaining said load control means in a predetermined adjusted position whereby said belt means applies a predetermined fixed load corresponding to the predetermined adjusted position.

2. The invention as recited in claim 1 wherein said retaining means comprises a spring exerting a biasing force on said disc.

3. The invention as recited in claim 2 wherein said spring is a coil spring mounted in compression against said disc.

4. In an exercising device, the combination comprising

a frame assembly adapted to remain stationary on a supporting surface,

handlebars and seating means on said frame assembly,

a rotatable wheel on said frame assembly,

actuating means for rotating said wheel,

belt means adapted to engage a portion of said wheel for placing a load thereon during its rotation,

load control means movable between a plurality of controlling positions for varying the load applied by said belt means to said wheel,

said load control means including a rotatable eccentric disc and a member carried by said frame assembly and being movable in response to movement of said disc for selecting the load applied by said belt means,

said member for selecting the load including an idler arm having a cam follower engaging said eccentric disc and an idler roller engaging said belt means,

a mounting assembly supporting said load control means on said frame assembly including a shaft element carrying said disc, and

retainer means carried by said mounting assembly and being in engagement with said load control means and retaining the same in its selected controlling position whereby a fixed load is applied by said belt means for such selected controlling position.

5. The invention as recited in claim 4 wherein said retainer means is disposed on said shaft element and biases said disc in its selected position.

6. The invention as recited in claim 5 wherein said retainer means comprises a coil spring mounted in compression against said disc.

7. The invention as recited in claim 6 wherein said belt means includes a flexible belt having opposite ends joined by a tension spring.

8. The invention as recited in claim 7 wherein said flexible belt engages said idler roller.

9. The invention as recited by claim 8 wherein a winding drum is rotatably carried by said shaft and said flexible belt in fixed to said winding drum for rotating the same in response to tension from said flexible belt.

10. The invention as recited in claim 9 wherein said pendulum means is suspended from said winding drum to compensate for torque during movement thereof.

11. The invention as recited in claim 10 wherein a fixed scale is carried by said shaft and said pendulum serves as a movable indicator for said fixed scale.

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