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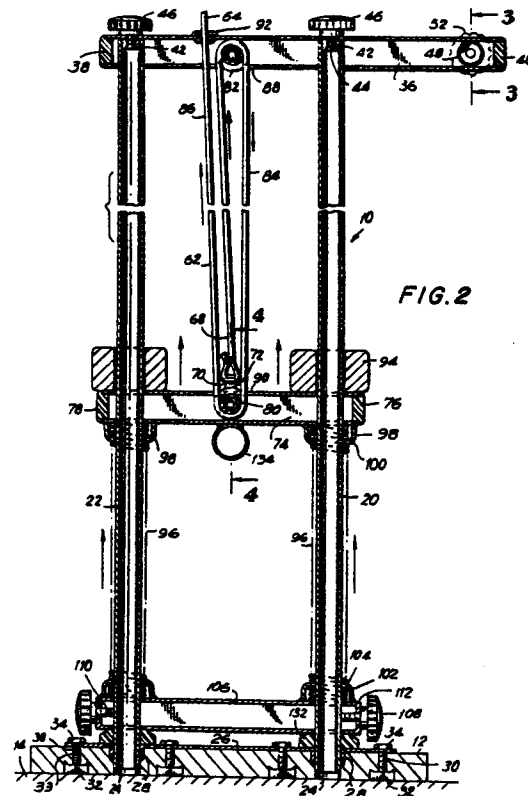
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Portable exercising apparatus.

An exercising apparatus including a platform - (12) on which there are detachably mounted a pair of half-frames, each composed of two erect stanchions (16, 18 and 20, 22) detachably secured thereto, the stanchions (16, 18 and 20, 22) of each half-frame being detachably interconnected to one another at their upper ends and the stanchions (16, 18 and 20, 22) of each half-frame each slidably supporting a pair of vertically spaced bars (74, 106) between which a pair of tension coil springs (96) encircle the stanchions with their ends secured to the bars. The lower bar (106) can be adjusted as to its height by the user thereby enabling tension exerted by the springs (96) to be varied. The upper bar (74) acts as a support for tori (94) that slide along the stanchions (16, 18, 20, 22). The upper ends of the stanchions (16, 18, 20, 22) are detachably connected to one another by bars (36). A pulley system (80, 82) is provided interconnecting the bar (36) at the upper ends of the stanchions (16, 18, 20, 22) with the uppermost of the two bars (74) slidable along the stanchions and the rope (62) of the pulley system is supplied with handles (66) at its upper ends to be grasped by an exerciser who pulls against the dead weights of the tori (94) and/or the resistance of the springs (74).



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PORTABLE EXERCISING APPARATUS

The invention generally relates to aerobic exercising apparatus and, more particularly, to portable, body-anchored exercising apparatus.

The concept of applying the body weight of an exerciser to anchor an exercising apparatus in place is well known in the art. United States patent 3,369,809 discloses an exercising device with a platform upon which a user stands to anchor the device against the floor. The device does not include any resistance means against which the user can stress his or her muscles for conditioning purposes.

Although the aforementioned foregoing device is satisfactory for its intended purpose, the lack of resistance means, limits the type of exercising that can be performed. Without the inclusion of any resistance means in the system, the only resistance provided is dependent upon the user's own efforts, i.e. such a device is basically an isometric device which is a rather dull type of exercising requiring a considerable amount of mental effort.

United States patent 3,834,694 discloses an exercising apparatus for exercising leg muscles. It includes a pad on which the user lies while using the exercising apparatus. The apparatus has a pair of pulleys and weights. The user lifts the weights while lying on a mattress. Although it is useful for its intended purpose, the apparatus of this patent is basically only intended to exercise the thigh, hamstring and groin muscles and is not a general purpose exercising device.

United States patent 3,995,853 discloses an exercising apparatus with a hand grip that can be pulled against an internal adjustable resistance. The apparatus is attached to a footrest upon which the user stands to stabilize the apparatus. The footrest is optional and the footrest may be permanently attached to fixed supports. The apparatus includes only a single pull cord and a resistance system. Hence, the user must move both arms in the same direction or only one arm at a time.

United States patent 4,195,835 discloses an elastic cable exercising bar which employs an elastic cable having its opposite ends connected to foot engaging members and its intermediate portion straddling a bar designed to be grasped by a user and pulled upwardly so that this too, is equipment of extremely restricted use.

United States patent 4,391,440 discloses an exercising apparatus by the inventor of the present invention, which is a forerunner of the present invention and which achieved the same general purposes, but over which the exercising apparatus of the instant invention constitutes a considerable

improvement in that it is easier to assemble and disassemble, is more rugged once assembled, is capable of a wider range of exercising, and can be made of a more attractive appearance.

Other patents in this area are United States patents Nos. 167,137; 190,150; 190,503; 1,372,026; 1,623,671; 3,056,603; 3,115,339; 3,369,809 and 4,077,626.

It is an object of the invention to provide an exercise apparatus and a method of exercising which avoid the disadvantages of prior art exercise devices.

This invention consists in a portable, body-anchored exercising apparatus comprising a platform; a pair of erect, vertically elongated, rigid half-frames, each constituted of a pair of vertical stanchions; means detachably attaching the lower ends of said stanchions to said platform adjacent opposite sides thereof; means detachably connecting said stanchions of each half-frame to one another adjacent their upper ends; means optionally detachably connecting the two half-frames to each other adjacent their upper ends; a pair of separate, elongated, flexible elements each mounted on and being axially movable along its axis of elongation in relation to a different one of the half-frames, said flexible elements being capable of being pulled by a user for exercise purposes and said flexible elements generating substantially upward forces on the platform when so pulled, each said flexible element of said pair of flexible elements having a grasping end which when idle is located at approximately mid-body level of an adult; separate resistance means on each half-frame for opposing the pulling force on the flexible elements generated by the user; and a pair of separate pulley systems, a different pulley system being associated with each different half-frame, each pulley system being operably interposed between a resistance means associated with its associated half-frame and an associated flexible element and including at least two vertically spaced pulleys about which the associated flexible element is trained, the upper pulley being rotatably supported by the associated half-frame at a high point thereof and the lower pulley supporting the associated resistance means whereby the apparatus has a mechanical advantage greater than 1 : 1 in favor of the grasp ends, the mechanical advantage allowing the user to move the grasp ends through a distance greater than the distance through which the associated resistance means moves; said platform, with the user's weight applied thereto, being operative to hold the apparatus down against the force exerted by the pulled flexible elements.

The apparatus of the invention can be made light in weight, so that a user can move the apparatus from place to place with no difficulty, since the apparatus is held in place by the user's body weight he or she does not have to provide special means for securing the apparatus in position while exercising.

The apparatus can be constructed so that it may be easily and readily disassembled and re-assembled quickly by people having little manual skill.

Another advantage of the invention resides in the inclusion of a pulley system in the apparatus which creates a mechanical advantage that permits the user to move his body through a distance which is significantly greater than the distance through which the resistance means of the apparatus must move.

In a preferred form of the invention, the resistance means constitutes a combination of weights and springs and means to render either of them, or both of them, effective.

In a preferred embodiment, the apparatus includes ropes or the like, that is to say, elongated limp elements, which are operatively attached between the resistance means and elements for engagement by a user's extremities, e.g. handles to be grasped by a user's hands, or stirrups for a user's feet. When handles, these elements are positioned at approximately upper-thigh level when the apparatus is idle, and thereby permit a user to perform a variety of different movements.

The apparatus also preferably includes an arrangement which permits the resistance means to selectively take the form of springs or weights, or a combination thereof.

Furthermore, the apparatus is so constructed that the major components thereof can be readily assembled into a condition for use and, when so assembled, can be readily and quickly disassembled in a minimum of time, even by people who are not skilled in the use of tools.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a front elevational view of an exercising apparatus of the present invention being used in accordance with one method of performing the present invention;

FIG. 2 is an enlarged fragmentary vertical sectional view of the exercising apparatus taken substantially along the line 2-2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken substantially along the line 3-3 of FIG. 2 and showing an end detail of a multi-purpose bar employed in the exercising apparatus;

FIG. 4 is an enlarged fragmentary sectional view taken substantially along the line 4-4 of FIG. 2, and including in dot-and-dash lines a phantom showing of an end of the multi-purpose bar as it is employed for one of its functions;

FIG. 5 is a front elevational view of the exercising apparatus with the parts thereof rearranged, and illustrating another exercising method pursuant to the present invention;

FIG. 6 is a front elevational view of the exercising apparatus with the parts thereof arranged the same as shown in FIG. 5 but illustrating a still different method of exercising pursuant to the present invention;

FIG. 7 is a side elevational view of the exercising apparatus, and illustrating still a further exercising method pursuant to the present invention;

FIG. 8 is a sectional view taken substantially along the line 8-8 of FIG. 7;

FIG. 9 is a fragmentary side elevational view of an exercising apparatus embodying a modified form of the invention; and

FIG. 10 is a plan view of another form of weight that can be used with an exercising apparatus embodying the invention.

Referring now in detail to the drawings, the reference numeral 10 denotes an exercising apparatus embodying the present invention. Said apparatus includes a base, i.e. a platform 12, adapted to rest upon a generally flat, horizontal surface such as a floor 14. The platform preferably is flat and comparatively thin, and preferably is relatively light. Typically, the platform is made of wood, e.g. 5/8 inch (16mm) plywood, and a typical length for the base is 24 inches (610mm) (side to side), and a typical width (front to back) is 12 inches (305mm). The width should be great enough to permit the mounting of vertical side stanchions, as soon will be described, spaced far enough apart to permit an exerciser to stand on the base between them.

Optionally, the base can be made of a lightweight metal such, for instance, as aluminum or an aluminum alloy. Nevertheless, wood is the material of choice for a reason which soon will be apparent.

The upper surface of the base should be attractively finished as, for example, by smoothing and polishing, although, preferably, this upper surface is covered with a fabric material (not shown), an example of which is a comfortable material such as a plush which is soft to the touch, and held in place as by adhesive (not shown).

The base serves as a support for four erect stanchions 16, 18, 20, 22. The stanchions 16, 20 are foremost, and the stanchions 18, 22 are rearmost, the stanchions 16, 18 being on the right side, and the stanchions 20, 22 being on the left side of the user. As noted earlier, the side-to-side spacing

of the stanchions is sufficient to permit a user to stand between them, while the front-to-back spacing of the stanchions is sufficient to permit mechanical elements to be located between them and to give the apparatus stability.

In order to impart ready disassembly and assembly to the apparatus, the base 12 is provided with sockets or through-openings 24 arranged in a rectangular pattern, and correctly spaced apart and of a proper size to nicely receive the lower ends of the stanchions 16, 18, 20, 22, as best shown in FIG. 2. The stanchions need only be received for a portion of the way into the sockets. It is not necessary that they reach all the way to or close to the surface of the floor 14. It is only desirable that the stanchions couple with the base.

Moreover, the two side stanchions, e.g. the stanchions 16, 18, and the stanchions 20, 22 as well, are coupled to each other in pairs as by a strip 26, one for each side. Each metal strip is formed with a pair of longitudinally spaced, downwardly protruding, integral stub annular flanges 28 into which the lower ends of the associated stanchions 16, 18, 20, 22 are fitted and firmly attached as by welding, so that at each side of the exercising apparatus there is a vertically elongated half-frame composed of a pair of stanchions permanently and rigidly joined by a metal strip 26. Each half-frame is secured to the platform 12 in a fashion which permits quick assembly and disassembly, and rigid connection when assembled by the following arrangement:

Each metal strip, with its associated stanchions permanently attached thereto, is placed flatly on the top surface of the platform 12 with its annular flanges 28 inserted in corresponding sockets 24 in said platform in which the flanges are dimensioned to be snugly received. Of course, such snug nesting is not sufficient to firmly secure the half-frames in place, although it does suffice to properly locate them on the platform. For firm securement, each strip is provided with several, for example, four, holes 30 spaced apart longitudinally of the strip and disposed substantially on the center line thereof, e.g. two on each side of the mid-length point thereof. On the underside of the platform, spike nuts 32 are sunk into appropriate recesses. The nuts are disposed with their threaded openings vertically beneath and registered with bores 33 in the platform that extend to the upper surface of the platform. Bolts 34 have their threaded stems extend through the holes 30 into the bores 33 and are threadedly received in the nuts 32. The bolts are screwed home in the nuts 32 until the undersurfaces of the heads of the bolts press firmly against the upper surfaces of the strips, thus effecting the desired firm securement of the half-frames to the platform in their desired erect position spaced

apart from one another and in mutual parallel up-standing relationship, ready for a user to position himself on the platform between them, where the user's weight will hold the platform down on the underlying floor against any pull exerted by the user on the exercising apparatus which would otherwise tend to lift the apparatus off the floor.

The two half-frames are tied together at their bottoms by their respective connections to the platform 12. The two stanchions of each pair also are tied together at their tops, so that at each side of the apparatus there is provided an erect, vertically elongated, rectangular, rigid half-frame. The bottom connection constitutes the coupling of the bottoms of the stanchions to the platform. The top connection for each half-frame is in the form of a front-to-back tube, i.e. a hollow bar 36 of square cross-section. The bar runs from well in front of each front stanchion to just behind each rear stanchion, as quite clearly shown in FIGS. 2 and 7. The rear end of each bar is closed as by a plastic plug 38, the rear end of which is headed as indicated to cover the raw rear end of the bar, and a similar plug 40 is provided for the front end of each bar. Each bar is of sufficient breadth to encompass the top of each of the two side stanchions with which it is associated, likewise as shown in FIG. 2, and each of said stanchions is provided with a metal plug 42 wedged into the upper end thereof and is formed with a central tapped bore to receive a threaded stem 44 of a handled screw 46, whereby at each side of the apparatus the tube 36 together with its associated stanchions forms a rigid, vertical, elongated side half-frame.

Moreover, means is included to hold together the side half-frames and thus rigidify the entire skeleton structure, i.e. frame, of the exercising apparatus. In part, said means includes the platform 12. Such rigidifying means further includes an upper cross tube 48 (FIGS. 2 and 3). The upper cross tube 48 is of circular cross-section, and preferably is hollow, being formed of metal, as are the stanchions and all of the various tubes. Said upper cross tube extends through registered openings adjacent the forward ends of the hollow bars 36 a short distance in back of the plugs 40, and is detachably rigidly held thereto as by handled screws 52 (see FIGS. 2 and 3), the threaded stems 54 of which are screwed into tapped bores 56 of plugs 58 that are wedged into the associated open ends of the upper cross tube 48. It will be appreciated that tightening the handled screws 52 will rigidify the connection between the upper cross tube 48 and the front-to-back upper hollow bars 36, and that tightening the handled screws 46 will rigidify the connection between the front-to-back hollow bars and the upper ends of the two stanchions to which they are thus connected.

Disregarding, for the moment, the exercising elements of the apparatus, and considering only disassembly of the rigid frame, to take it apart one merely unscrews the four handled screws 46 and the two handled screws 52, whereupon the frame is ready to be "knocked down" by removing the tube 48 and the hollow bars 36 which rigidify the upper ends of the stanchions. Next, the eight bolts 34 are unscrewed to disconnect the two strips 26 from the platform, and the two half-frames are lifted out of the sockets 24, whereupon all the elements may be stowed compactly into a flat container for storage or transport. The frame is readily assembled by reversing the foregoing operations.

Turning now to the exercising portion of the apparatus, it includes, in conjunction with each half-frame, an elongated, flexible, limp, preferably non-elastic member such, for instance, as a nylon rope 62. In other words, there are a pair of these ropes, one at each side of the apparatus. On end of each rope, which is arbitrarily denominated the upper end 64, has mounted thereon an element designed to be engaged by an extremity of a user's limb. For example, the element, as shown, constitutes a stirrup, i.e. a handle 66, of appropriate configuration and dimension either to be grasped by a human hand (see FIG. 1) or to have the arch of a human foot placed thereon (see FIG. 7).

The other, i.e. lower, end 68 of each rope is secured by a loop 70 to a bail 72 supported on a front-to-back cross bar 74 of square cross-section - (see FIG. 4). The front and back ends of these cross bars are closed by plugs respectively 76, 78. Said cross bars 74 are vertically slidable, each on its associated half-frame at the respective side of the exercising apparatus and, to this end, each cross bar has a pair of vertically registered openings adjacent its front end and back end that slidably accommodate the respective stanchions.

Mounted on the center of each cross bar for rotation relative thereto about an axis, said axis being horizontal when the stanchions are vertical and being perpendicular to the longitudinal axis of such cross bar 74, is a sheave 80. For the sake of appearance, and to improve the stability of the exercising apparatus during use, the sheaves 80 preferably are approximately midway between their respective stanchions.

A reach of the rope 68 extends from the bail 72 to a second sheave 82 mounted for rotation about an axis parallel to the axis of rotation of the sheave 80 on the tube 36 on the same half-frame as that on which the sheave 80 is mounted. After turning about the sheave 82, the rope has a descending reach 84 which engages the sheave 80, turning about the same to enter into an ascending reach 86 that terminates at the upper end 64 of the rope where it engages a handle or stirrup 66. The as-

cending reach between the bail 72 and the sheave 82, and the descending reach 84 between the sheaves 82, 80, pass through an opening 88 on the lower side of each of the tubes 36. Likewise, the one descending and two ascending reaches of the rope pass through an opening 90 in the upper side of each of the cross bars 74. The ascending reaches 86 of the ropes slide through grommets 92 fixed in the upper walls of each of the tubes 36. The ropes smoothly engage the grommets to permit substantially free sliding movement of the ropes through the grommets in sundry angular positions of the rope with respect to the grommets, even when the ropes experience sharp angular bends as they emerge from the grommets (see, for example, FIGS. 1, 6 and 7). To facilitate such easy movement of the ropes, both the ropes and the grommets preferably are made from plastic materials, the ropes, as already noted, desirably being made of nylon, and the grommets being similarly made from the same plastic, or metal with a smooth finish.

The ropes and sheaves, as described, constitute pulley systems that supply the exercising apparatus with a 3:1 mechanical advantage that permits the user to move his body extremities which engage the rope ends through distances which are significantly larger than the distances through which the bails 72 must move during exercising, the bails being attached to resistance means soon to be described. This makes it possible to keep the exercising apparatus compact without significantly limiting the user's movement during exercising, and yet allows the use to perform a wide variety of exercises, some of which will be explained hereinafter.

The resistance means heretofore alluded to can, pursuant to the present invention, constitute either or both of two types of resistances, one being dead weights, which is to say, weights which, although adjustable as to amount when once set, will offer an unvarying resistance; and the other being a variable resistance, which is to say, a resistance that varies with the amount of movement which it is caused to experience --in other words, a resistance which varies in degree as a function of the amount of movement which it is caused to undergo, for example, and typically, a resistance which increases as the amount of movement experienced thereby increases, the increase either being linear or progressive. Typically, a dead weight type of resistance simply constitutes a weight or series of weights, and typically a progressive weight resistance constitutes springs. Pursuant to the present invention, the exercising apparatus is so constructed that either or both such resistance means can be employed.

The four stanchions serve as adjuncts for the resistance means.

The weight resistance means, in its simplest form, constitutes a plurality of tori 94 of heavy material, e.g. metal, for example, iron, of various weights. For instance, the tori illustrated are 2-1/2 pound (1.1kg) weights. If one torus is threaded on each stanchion and allowed to rest on an appropriate end of a cross bar 74, there will be four such weights positioned, so that when a user exercises by pulling on the two ropes 62 by means of the stirrups 66, he will be vertically lifting 10 pounds - (4.5kg), 5 pounds (2.3kg) with each rope. When he exercises, he will be able to pull the ropes a distance equal to approximately three times the distance between the cross bars 74 and the tubes 36, this by virtue of the 3:1 mechanical advantage of the pulley system.

To emplace such weights 94, which are complete tori, it is necessary first to remove the tubes 36, and this is done by removing the four handled screws 46 at the heads of the stanchions and lifting off the tubes, which will leave the tips of the stanchions accessible. The tori can be removed in the same manner. Sufficient tori and different weights of tori are threaded onto the stanchions to provide the desired degree of resistance for the user. Desirably, the tori are approximately equally distributed as to weight on the four stanchions so as to discourage skewing of the apparatus.

An alternate, and optionally usable, form of resistance means constitutes four helical tension springs 96, each one ensheathing a different one of the stanchions below the cross bars 74. The upper ends of the springs are permanently anchored to the cross bars 74 as with ferrules 98 having lower in-turned lips 100 that hold captive one or a few convolutions of the associated spring. The ferrules are secured to the undersurfaces of the cross bars 74 in any suitable manner as, for example, by welding. The lower ends of the springs are secured to ferrules 102 by having the lips 104 of the ferrules captively retain one or a few convolutions of the associated spring in the region of said lower end. The ferrules, quite apparently, encircle the associated stanchions, and each ferrule is permanently and rigidly secured, as by welding, to the front or rear end of a cross bar 106 which bridges the stanchions for the half-frame with which the particular springs are associated. Each of the cross bars 106 is formed with vertical openings therein which slidably pass the affiliated stanchions, thereby permitting the cross bar at each side of the apparatus to slide up and down the stanchions. However, such movement can be prevented by tightening handled screws 108 whose stems 110 engage threaded bores in end walls 112 of the cross bars 106.

From the foregoing, it will be apparent that if the cross bars 106 are anchored, which is to say, held fast, to the four stanchions by tightening the handled screws 108 so that the tips thereof bear against the lower ends of the stanchions so as to act as set screws, when the user of the apparatus pulls on the ropes 62 and thereby raises the cross bars 74, such action will stretch all four springs 96 which thus act as resistance means. Such resistance will be in addition to the minor weight of the cross bars 74, the ropes 62 and the sheaves 80, and will be in addition to or without the dead weights, i.e. the tori 94, depending upon their presence or absence.

If it is desired to exercise without the opposition of the springs 96, the user loosens the handled screws 108 so that now, when the ropes 62 are pulled and the cross bars 74 are raised, the springs 96 will be raised bodily but not stretched, and the resistance offered by the springs now will simply constitute their combined dead weights, which are slight in comparison to the combined dead weights of the tori.

Although the apparatus is quite simple to disassemble in whole or in part, and it is therefore not difficult to take off the top four screws 46 and the top two cross bars 36, if it is desired to remove or add tori, instead of using weights which are in the configuration of complete annuli, a different form for the weights conveniently can be employed, namely, that of a mutilated annulus, or, to be more descriptive, an annulus with a section missing which is defined by two parallel planes, i.e. a slot with parallel sides, the walls of which are slightly greater, e.g. 1/8 inch (3 mm) greater, than the stanchion on which the mutilated annulus is to be mounted, and the center of the slot being coincident with the axis of symmetry of the annulus. The mutilated annulus of this configuration can be slipped onto or removed from a stanchion in a transverse direction with ease, and without the necessity of removing the handled screws 46 and cross bars 36. A mutilated annulus of the foregoing configuration is shown in FIG. 10 where it is referenced 114. It is pointed out that the upper and lower surfaces of such mutilated annuli are flat and perpendicular to the longitudinal axis of the stanchion on which they are to be emplaced, so that their weight will tend to hold them in place when a single such annulus rests on a cross bar 74, or when such annuli are stacked.

It will be appreciated that the resistance offered by the springs can be varied easily and quickly simply by changing the positions of the lower cross bars 106, and this can be accomplished by loosening the handled screws 108, setting the cross bars 106 to any desired positioning, and then retightening the handled screws 108. It is quite apparent

that, by lowering the positions of the cross bars the resistance offered by the springs will be increased, and by raising the positions of the cross bars, the resistance offered by the springs will be decreased.

As a convenience, alternate means may be provided to vary the resistance offered by the springs 96, one such means being illustrated in FIG. 9. The handled screws 108 permit infinite variations in the resistance offered by the springs, inasmuch as it is possible, by the use of these screws, to set the cross bars 106 in essentially any positions that the user desires on the stanchions. The alternate variation shown in FIG. 9 permits only a limited number of changeable settings for the lower ends of the springs, but is more convenient to use. Pursuant to this arrangement, a lower cross bar 106' is fashioned with a slot 116 through which a standard 118 extends. There is one standard and one cross bar 106' for each half-frame. Each standard is firmly secured as by rivets 120 to its associated strip 26, and is provided with a vertically aligned series of through-holes 122 preferably disposed at uniformly spaced intervals and of the same diameters. Mounted on the cross bar 106' is a U-shaped bracket 124 with upright parallel arms. The arms are formed with a set of horizontally registered openings through which a locking pin 126 extends. A compression spring 128 between the arms of the bracket biases the tip of the pin away from the standard 118. The pin is provided with a handle 130 which is outside the arm of the bracket remote from the standard 118.

The locking pin has a pair of radially spaced protrusions (not shown) near the handle 130 and the opening in the bracket arm remote from the standard has a pair of radially opposed notches - (not shown) that match said protrusions when the protrusions are angularly aligned therewith. The protrusions are so axially located on the pin that they are in the vicinity of the arm of the bracket remote from the standard. The spring 128 is compressed between the ends of the protrusions closer to the standard and the inner surface of the bracket arm proximate to the standards so that in idle position of the pin said spring lifts the tip of the pin clear of the standard and at this time the protrusions extend part way through the radial notches. When the locking pin is in this idle position, the cross bar 106' can be slid up and down the standard 118 to any of various positions in which the locking pin is aligned with any selected one of the openings 122. The user selects any particular opening to obtain some desired spring resistance; then with the cross bar 106' so positioned the user pushes the locking pin toward the standard 118 against the oppositions of the spring 128 until the tip of the spring passes through the opening 122

with which it is in alignment. Thereupon the user twists the handle and the pin. This will angularly disalign the protrusions and notches which by virtue of pushing the pin as aforesaid will have been axially disaligned so that when the pin is released, the spring cannot force the locking pin out of the opening whereby the user may proceed to exercise with the springs in their set positions.

It will be observed that elastomeric, e.g. rubber bumpers 132 desirably rest on the upper surfaces of the strips 26 around the bases of the sundry stanchions to cushion the descent of the cross bars 106 when the springs 96 are allowed to move bodily up and down with the tori 94, the handled screws 108 having been loosened.

Attention is directed to the fact that the cross bars 74 on the two half-frames are provided with rings 134 (see FIGS. 2 and 4) secured to these cross bars as by welding on the lower faces thereof and arranged with the central openings thereof perpendicular to the longitudinal axis of the cross bar 74. These rings are in registry and are dimensioned to nicely receive the hollow circular tube 48 when so desired by a user of the exercising equipment. A placement of the tube 48 in such position is illustrated in dotted lines in FIG. 4. The tube 48 is shown empty in FIG. 2.

The exercising apparatus 10 can be used in a wide variety of ways and, indeed, it is an attribute thereof that, despite its light weight, quick and easy assembly and deceptively simple appearance, it is capable of being used for a large number of exercises, some of which are illustrated in the drawings.

FIG. 1 shows one simple form of exercise. In it, the cross bar 48 bridges the tubes 36 of the two half-frames so as to rigidify the entire exercising apparatus. The user then stands erect on the platform between the two half-frames. The sides of the stanchions are such that an adult will have his or her hips at a level somewhat above the tops of the half-frames and his or her hands which when hanging down are normally at about hip level, will be able readily to grasp the two stirrups as shown in FIG. 1. Now, the user can exercise by raising his hands from hip level to outstretched position, shoulder high. He can raise either one arm at a time, both arms together, or alternate his arms. He can raise his hands against whatever dead weight he has placed on the stanchions to test on the ends of the cross bars 74, or he can, by loosening the handled screws 108, disengage the resistance of the springs 96 and merely use their slight dead weights or, if he wishes, he can tighten the handled screws 108 in any of various positions along the

stanchions so as to obtain a variety of spring resistances or he can combine the dead weights of selected tori with spring resistance such as may be selected.

As an alternative to lifting one or both arms singly or combined to shoulder height, he can flex his elbows so as simply to raise his hands to his shoulders and thus exercise his forearms or, with his arms at his shoulders, raise and lower his elbows. Still further, because of the 3 to 1 movement ratio heretofore mentioned, he can move his hands from hip level to fully upstretched position. Even this fairly substantial movement of the arms is permitted against variable types of resistance by virtue of the structure herewith provided.

Nor are the foregoing all of the exercises that the apparatus 10 permits. Thus, referring to FIG. 5, the user can dismount the tube 48 by loosening the handled screws 52 and inserting the tube in the rings 134 and, by standing on the platform between the two half-frames, the user, by grasping the tube 48 and raising the same, can strengthen his abdominal, pectoral and back muscles. In performing this exercise, the stirrups are not utilized.

Referring to FIG. 6, still another exercise is illustrated. Here, with the tube 48 in the rings 134, the user lies flat on his back on the platform 12 beneath said tube and grasping said tube with his hands, pushes it up and allows it to come down, here exercising his pectoral, back and arm muscles.

Even the leg muscles can readily be exercised as illustrated in FIG. 7 by placement of the arches of the feet on the stirrups.

Various additional forms of exercise, too numerous to mention, can be effected with the apparatus 10.

Claims

1. A portable, body-anchored exercising apparatus comprising:

- a) a platform;
- b) a pair of erect, vertically elongated, rigid half-frames, each constituted of a pair of vertical stanchions;
- c) means detachably attaching the lower ends of said stanchions to said platform adjacent opposite sides thereof;
- d) means detachably connecting said stanchions of each half-frame to one another adjacent their upper ends;
- e) means optionally detachably connecting the two half-frames to each other adjacent their upper ends;

f) a pair of separate, elongated, flexible elements each mounted on and being axially movable along its axis of elongation in relation to a different one of the half-frames, said flexible elements being capable of being pulled by a user for exercise purposes and said flexible elements generating substantially upward forces on the platform when so pulled, each said flexible element of said pair of flexible elements having a grasping end which when idle is located at approximately mid-body level of an adult;

g) separate resistance means on each half-frame for opposing the pulling force on the flexible elements generated by the user; and

h) a pair of separate pulley systems, a different pulley system being associated with each different half-frame, each pulley system being operably interposed between a resistance means associated with its associated half-frame and an associated flexible element and including at least two vertically spaced pulleys about which the associated flexible element is trained, the upper pulley being rotatably supported by the associated half-frame at a high point thereof and the lower pulley supporting the associated resistance means whereby the apparatus has a mechanical advantage greater than 1 : 1 in favor of the grasp ends, the mechanical advantage allowing the user to move the grasp ends through a distance greater than the distance through which the associated resistance means moves;

i) said platform, with the user's weight applied thereto, being operative to hold the apparatus down against the force exerted by the pulled flexible elements.

2. An apparatus as set forth in claim 1, wherein the resistance means constitutes dead weights slidable along the stanchions.

3. An apparatus as set forth in claim 2, wherein each dead weight is a torus.

4. An apparatus as set forth in claim 3, wherein each torus has a slot therein wide enough to transversely admit a stanchion.

5. An apparatus as set forth in claim 1, wherein the resistance means constitutes springs encircling the stanchions.

6. An apparatus as set forth in claim 1, wherein the resistance means constitutes a combination of dead weights and springs and means to render either of them, or both of them, effective.

7. An apparatus as set forth in claim 6, wherein each half-frame includes a pair of bars slidable on the stanchions which form that half-frame, wherein means is provided optionally to fix the lower bars in a variety of positions on the stanchions on which they slide, wherein the upper bars are adapted to serve as supports for the dead weights which are slidable on the stanchions and wherein the springs

comprise helical tension springs encircling the stanchions with their opposite ends fixed to the bars whereby a user can select either dead weights or springs as his resistance means or a combination of both.

8. An apparatus as set forth in claim 7, wherein an elastomeric bumper is provided at the base of each stanchion to cushion the descent of the lowermost bar.

9. An apparatus as set forth in any preceding claim, wherein the means optionally detachably connecting the two half-frames to one another adjacent their upper ends constitutes a bar, wherein the stanchions of each half-frame slidably support a bar for vertical movement, wherein each thus vertically slidable bar carries means for optionally having affixed thereto the means for optionally detachably connecting the two half-frames to each other so that in its second-named position, it can be grasped by a user for exercising movement and in its first-named position, it is utilized to stabilize its two half-frames by holding them in fixed position apart while the user exercises by pulling on the flexible elements.

10. An apparatus as set forth in any preceding claim, wherein the means detachably attaching the lower ends of the stanchions to the platform adjacent opposite ends of the platform comprises, for each half-frame, a metal strip to which the lower ends of the stanchions of each half-frame are per-

manently, rigidly attached, each said strip having a pair of spaced, downwardly extending annular stub flanges, said platform having sockets adjacent opposite sides thereof in which said annular flanges are receivable and means for detachably attaching said strips to said platform.

11. An apparatus as set forth in any preceding claim, wherein each half-frame has a pair of bars slidable along the two stanchions thereof, the uppermost bar serving as a support for dead weights superposed thereon and slidable along the stanchions, tension springs encircling the stanchions between the two bars and affixed at their opposite ends to said bars and erect standards secured to the platform and in registry with a slot provided in the lowermost bar, said standard being formed with vertical registered openings, said lowermost bar being provided with a locking pin carried by the lowermost bar, the tip of which can selectively move into or out of any selected one of said openings whereby to vary the resistance offered by the springs to a user pulling on the flexible elements.

12. An apparatus as set forth in claim 11, wherein the locking pin is biased away from engagement with the openings in the standard and is provided with means to selectively set the pin when the tip thereof is in engagement with any selected one of the openings.

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FIG. 1

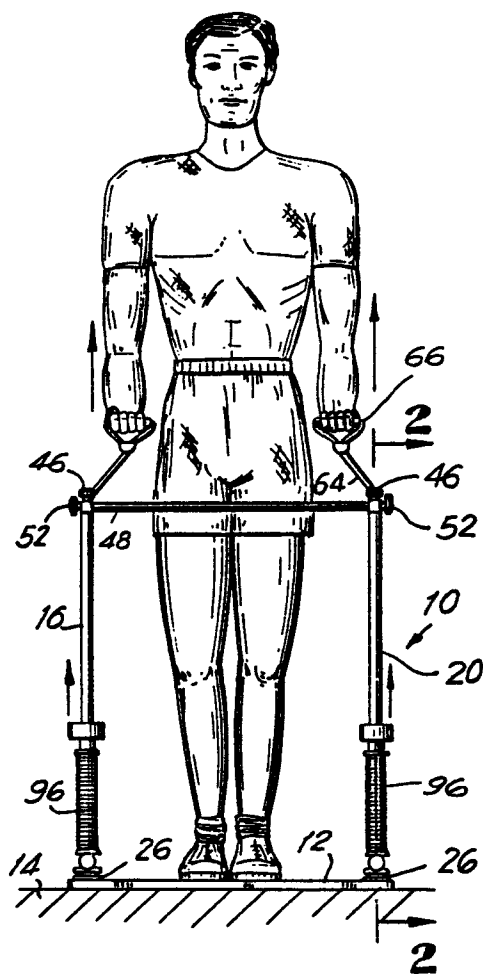


FIG. 3

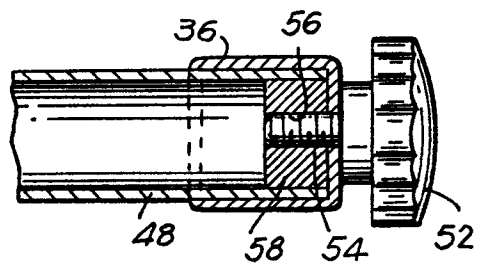
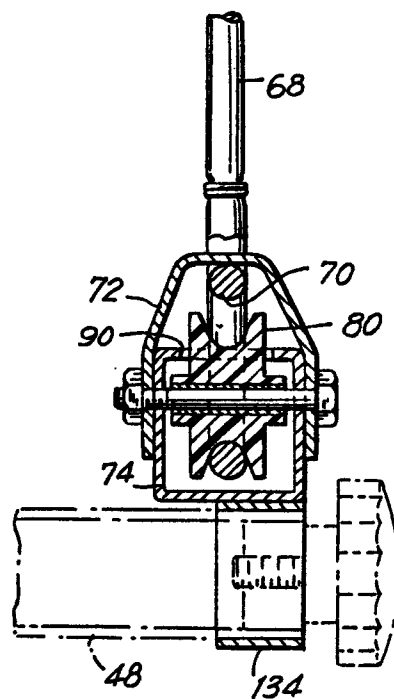


FIG. 4



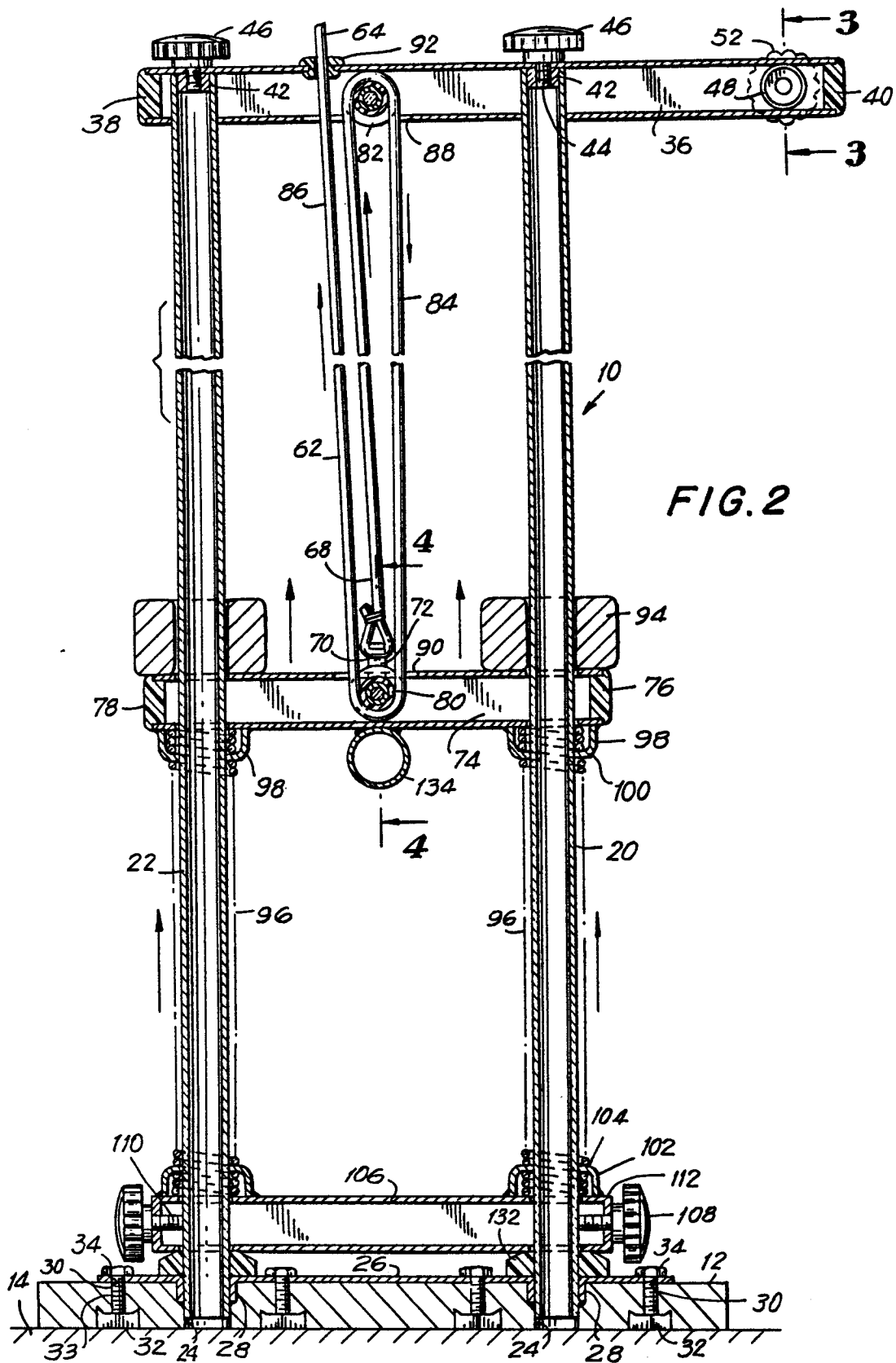


FIG. 5

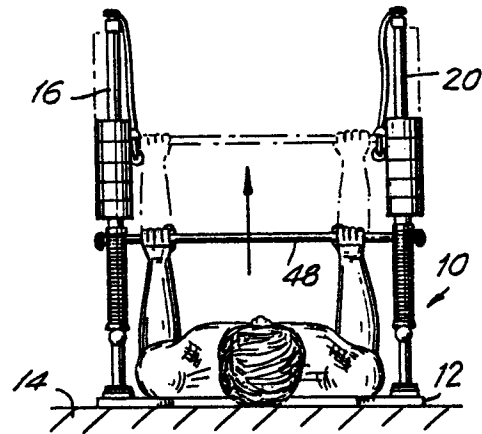
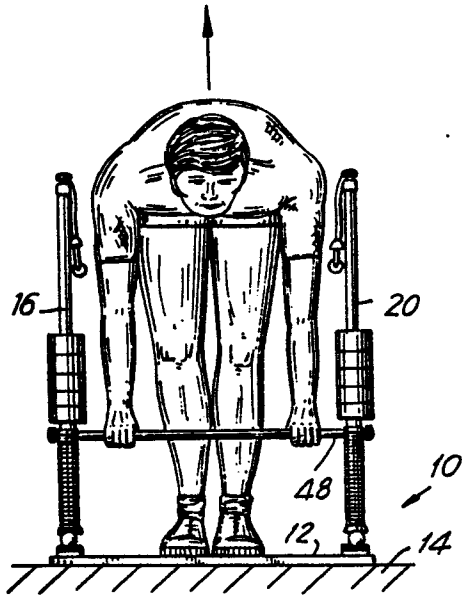


FIG. 6

FIG. 7

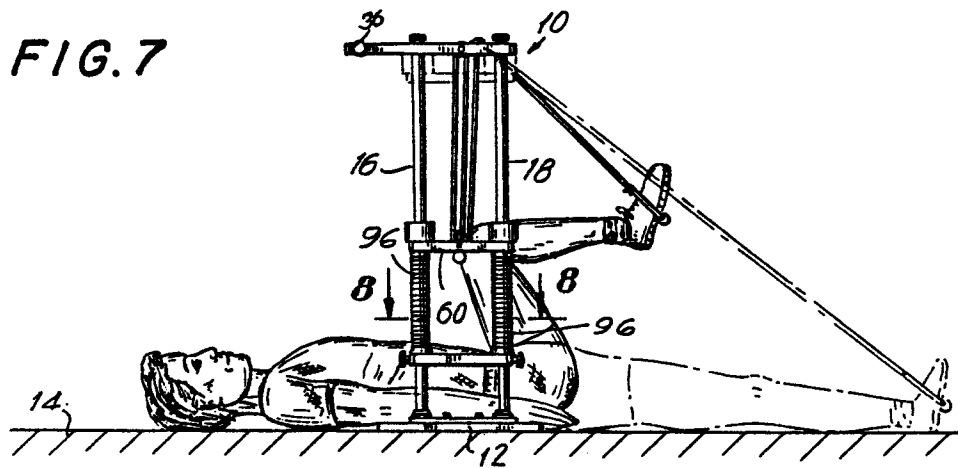


FIG. 8

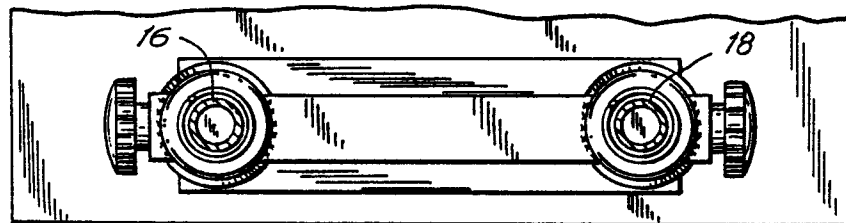


FIG. 9

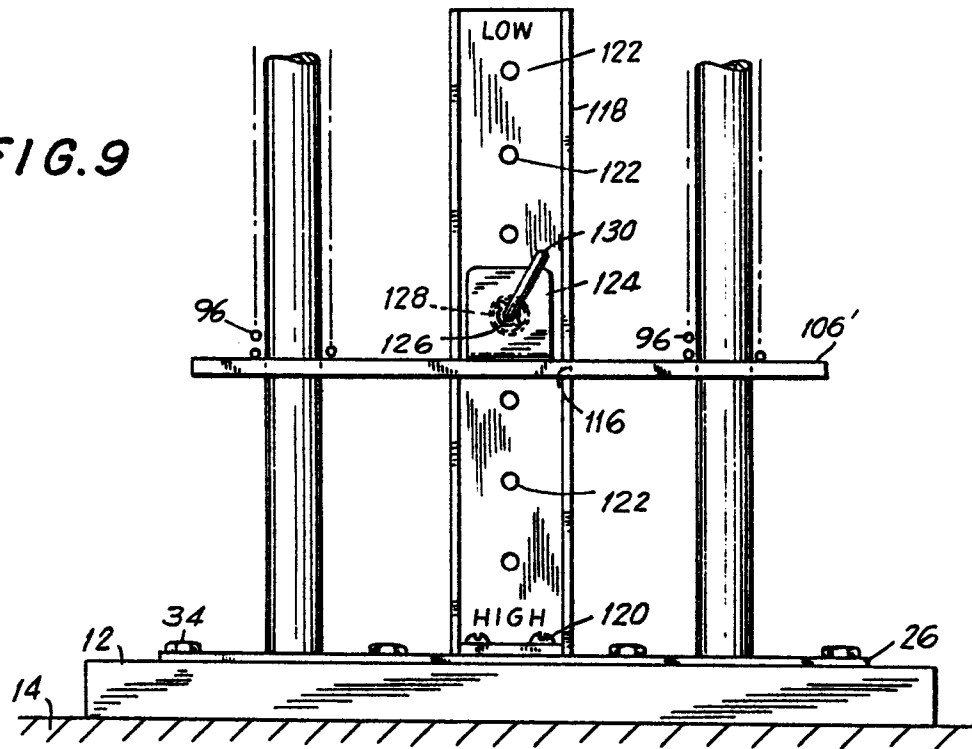


FIG. 10

