(12) UK Patent Application (19) GB (11) 2 052 274 A

(21) Application No **8003949**
(22) Date of filing **6 Feb 1980**
(30) Priority data
(31) **51049U**
(32) **22 Jun 1979**
(33) **United States of America (US)**
(43) Application published **28 Jan 1981**
(51) **INT CL³ A63B 21/00**
(52) Domestic classification **A6M** 8F 8J1AY 8J1Y 8JY
(56) Documents cited
GB 1364977
US 3971555A
US 3912263A
(58) Field of search **A6M**
(71) Applicants
Marcy Gymnasium Equipment Co., 1736 Standard Avenue, Glendale, California 91201, United States of America.
(72) Inventors
Tim Minoru Uyeda, Parker Edward Mahnke.
(74) Agents
Page, White & Farrer

(54) **Single column exercising apparatus**

(57) The apparatus has a single guide column 16 adapted to guide a vertically reciprocative carriage 14 provided with first and second vertically spaced bearing means such as rollers 30a and 32a and with an outwardly extending lifting arm 18 engageable by the trainee, the guide column 16, as well as a weight selector bar 24 which is connected to the carriage 14, extending through centrally disposed apertures formed in a plurality of weights 22 positioned substantially directly below the carriage 14. When the bar 24 is selectively interconnected with one or more weights, a force exerted on the lifting arm 18 will cause the carriage 14 and bar 24 to move upwardly against the urging of the weights, the column 16 accomplishing the dual function of guiding the travel of the carriage 14 as well as constraining the path of travel of the weights 22.

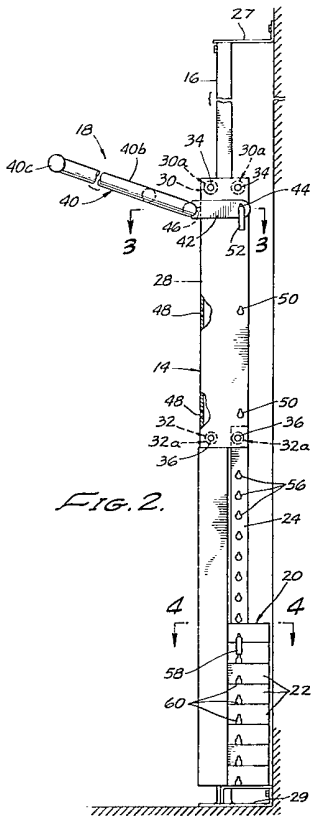


FIG. 2.

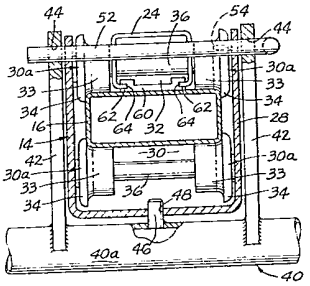


FIG. 3.

GB 2 052 274 A

2052274

FIG. 1.

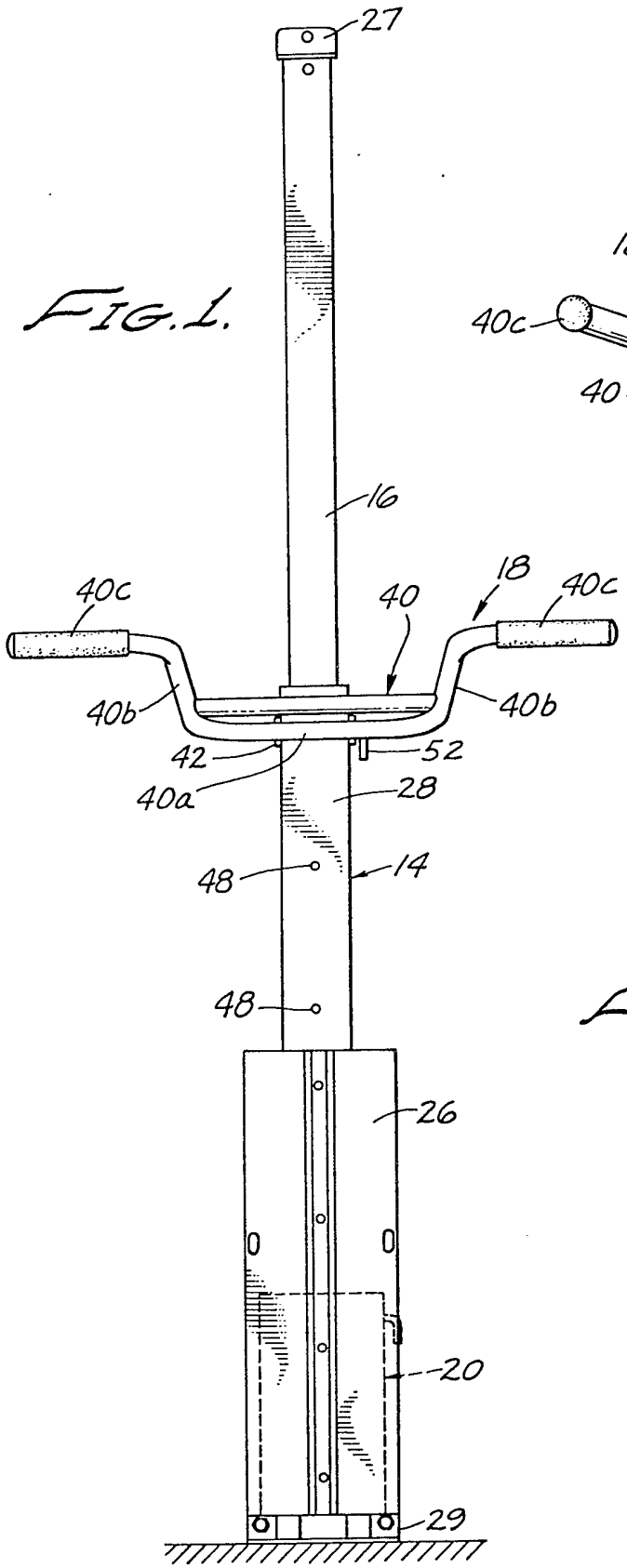
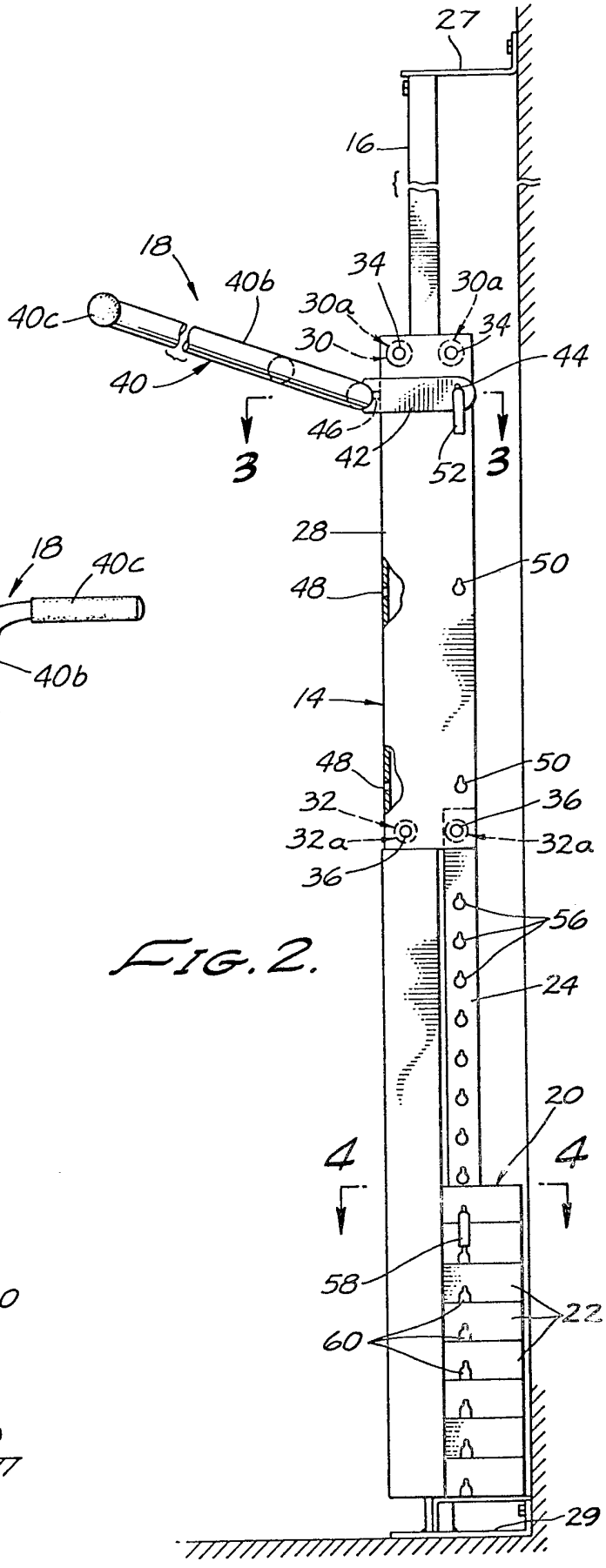


FIG. 2.



2052274

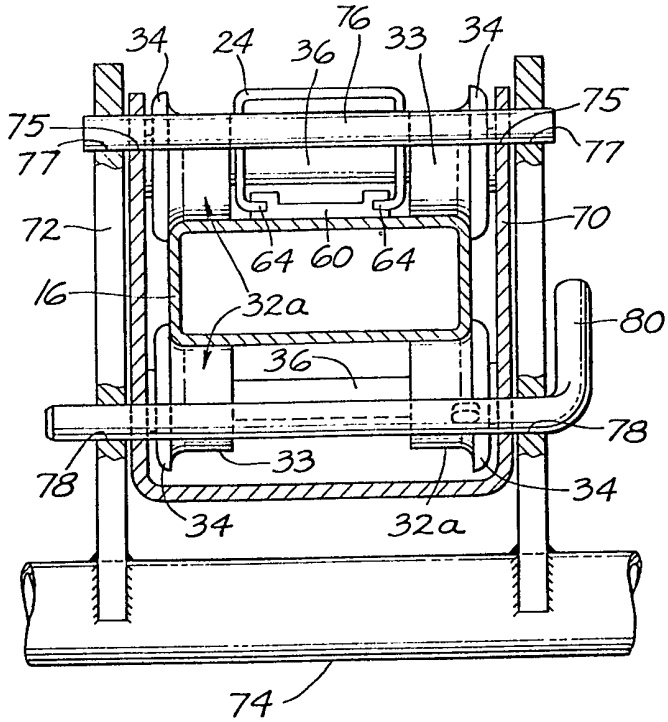


FIG. 6.

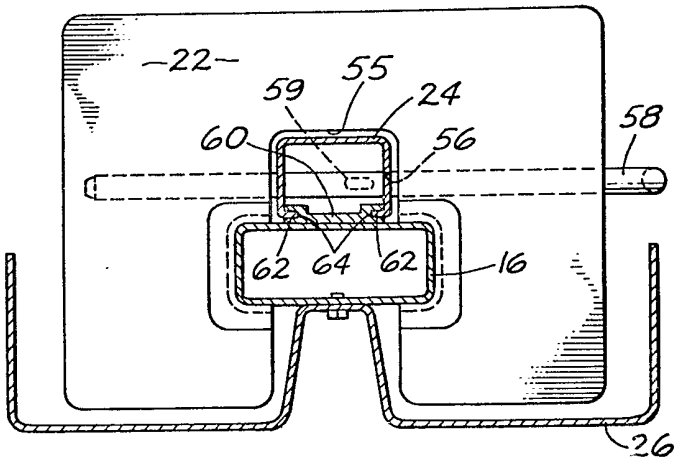


FIG. 4.

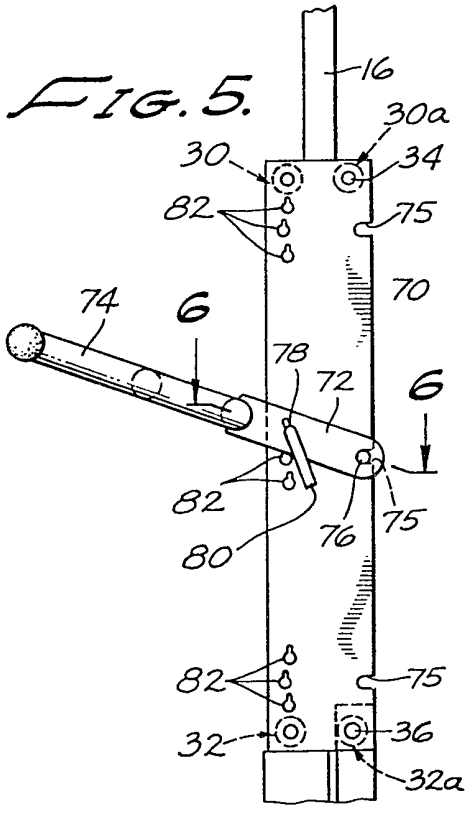


FIG. 5.

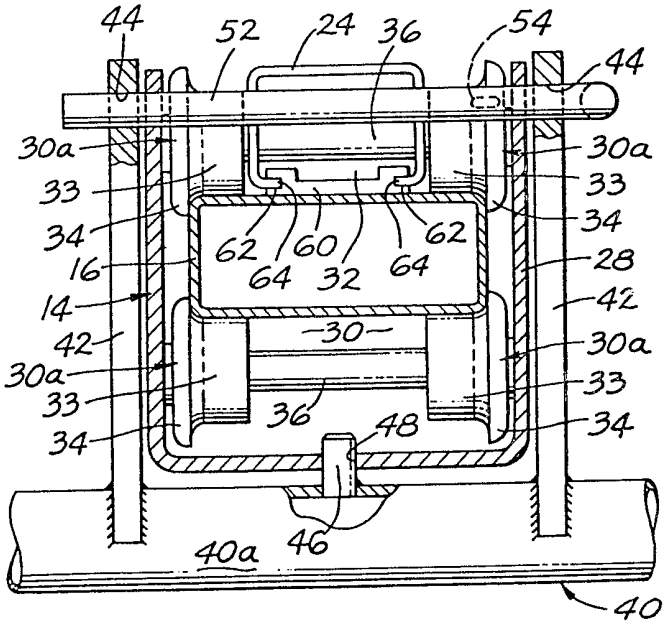


FIG. 3.

SPECIFICATION

Single column exercising apparatus

The present invention relates generally to exercising apparatus and more particularly to a compact, wall mounted exercising machine for accomplishing progressive resistance exercises.

The therapeutic value of progressive resistance exercises has long been recognized. Exercising muscles against progressively increasing weights not only results in added strength and endurance in the muscles, but also in the improvement of neuromuscular coordination and in a more efficient functioning of the cardiovascular and respiratory systems.

Traditionally apparatus such as dumbbells and barbells have been used for progressive exercises. The use of such apparatus, however, can be extremely dangerous when undertaken without proper training and supervision. When a large amount of weight is being lifted, barbells are particularly dangerous and present difficult balancing problems. If they are dropped, serious injury can result to the trainee or to those about him.

In the past, various types of progressive weight training machines have been suggested to overcome the drawbacks of barbells and dumbbells. However, to provide the required versitility and ensure trainee safety such machines have typically been quite large and bulky and have required substantial amounts of floor space.

Among the most successful prior art devices known to us are those described in U.S. Patent No. 3,971,555 and in U.S. Reissue Patent No. 28,066. We are also aware of U.S. Patents Nos. 3,905,599 and 3,912,263.

It is an object of the present invention to provide an improved, wall mounted progressive resistance exercise machine which is simpler, less bulky, and less weighty than prior art machines making it ideally suited for use in homes, apartments and offices as well as in gymnasiums.

According to the present invention there is provided an exercising apparatus comprising a vertically reciprocative carriage, having first and second vertically spaced apart bearing means; a substantially vertically disposed central guide column having first and second guide means for guiding said first and second bearing means of the carriage; body engaging means projecting laterally outward from the carriage for moving the carriage upwardly relative to the central guide column; and biasing means for biasing the carriage against upward movement.

The engineering design and overall simplicity and compactness of the apparatus of the present invention permits it to be inexpensively manufactured, easily set up and operated in numerous locations, and to be safely used even by unskilled persons with a minimum of training.

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

Figure 1 is a front elevational view of one embodiment of the single column exercising apparatus of the invention,

Figure 2 is a side elevational view of the apparatus of Figure 1, on an enlarged scale and partly broken away to show internal construction,

Figure 3 is a cross-sectional view taken along lines 3-3 of Figure 2 illustrating the construction of the body engaging means and its method of connection to the reciprocal carriage,

Figure 4 is a view taken along lines 4-4 of Figure 2 illustrating the unique construction of the central guide column, the selector bar and the apertured weights of the apparatus,

Figure 5 is a fragmentary side elevational view showing another embodiment of the single column exercising apparatus of the invention,

Figure 6 is a cross-sectional view taken along lines 6-6 of Figure 5.

Referring to the drawings, and particularly to Figures 1 to 3, one form of the single column exercising apparatus of the invention comprises a vertically reciprocative carriage 14, a substantially vertically disposed central guide column 16, body engaging means 18 projecting laterally outward from carriage 14 and biasing means in the form of a stack of weights 20 for biasing the carriage against upward movement by forces exerted on the body engaging means. As best seen in Figure 2, the carriage 14 and one or more of the weights 22 of the weight stack 20 can be interconnected by a selector means shown here as comprising a substantially vertically disposed connecting column 24.

Turning to Figure 4, it can be seen that each of the weights 22 which make up the weight stack is apertured to closely receive both central guide column 16 and connecting column 24. This unique construction has numerous advantages, one of which is the elimination of the requirement for separate guide means for guiding the vertical travel of the weights within the apparatus. As also shown in Figure 4, a protective means in the form of a rigid vertically extending shield member 26 is connected to the lower front surfaces of guide column 16 to shield the trainee from the weight stack. This protective shield precludes injury to the trainee or others should the weights accidentally be dropped during the performance of an exercise.

Referring once again to Figures 1 and 2, brackets 27 and 29 are provided at the top and bottom of vertical column 16 to conveniently attach the apparatus to a wall or other vertical structural member. When the apparatus is installed in the manner shown in the drawings, brackets 27 and 29 securely position the central guide column 16 in a spaced apart relationship with respect to the wall or other vertical structure.

Because of the unique single column design of the apparatus, a minimum amount of floor space and wall area is required to install the apparatus. This feature, along with the simplicity of the design and maximum weight savings attributable thereto, permits the apparatus to be conveniently installed and used in homes, offices or apartments, as well as in gymnasiums.

Turning now to Figure 3, carriage 14 is seen to

comprise a generally "U" shaped housing 28 adapted to carry first and second vertically spaced apart bearing or roller means. In the embodiment of the invention shown in the drawings, these latter means are provided in the form of upper and lower sets of wheel means 30 and 32 respectively (Figure 2). Upper wheel means 30 include front and rear pairs of rollers 30a which are coaxially mounted on horizontally spaced apart axles 34 carried by housing 28. Similarly lower wheel means 32 include front and rear pairs of rollers 32a which are coaxially mounted on horizontally spaced apart axle members 36 carried by "U" shaped housing 28. Rollers 30a and 32a are of identical configuration, each having hub portions 33 and flange portions 34.

Central guide column 16 is provided with first and second guide means for guiding said bearing or roller means of the carriage 14. In the embodiment of the invention shown in the drawings, central guide column 16 is substantially rectangular in cross-section and said first and second guide means comprise front and rear guide surfaces which are rollably engaged by the hub portions 33 of rollers 30a and 32a. Central guide column 16 is also provided with guide surfaces of each side thereof, adapted to be rollably engaged by flange portions 34 of rollers 30a and 32a.

As will be discussed in greater detail hereinafter, an important and highly novel feature of the invention resides in the fact that the single central column 16 not only functions to guide vertical travel of the carriage in the manner just described, but also functions as to guide the vertical travel of the weights thereby eliminating the need for separate guide columns for the weights.

In the form of the invention shown in Figures 1 to 4, the body engaging means 18 comprises a lifting arm or handle bar structure 40 which can be removably connected to carriage 14 at vertically spaced apart locations. Referring to Figure 1, lifting arm 40 includes a central portion 40a, a pair of flared out portions 40b and a pair of handle portions 40c. As shown in Figure 3, extending rearwardly from central portion 40a, is a pair of transversely spaced apart arm members 42, each of which is provided with a keyhole shaped aperture 44 proximate its inboard end. Disposed intermediately of arms 42 and extending rearwardly from central portion 40a of handle bar 40 is a stud 46 adapted to be closely received in vertically spaced apart apertures 48 provided in carriage 14 (Figure 1).

The spacing between arms 42 is slightly wider than the width of housing 28 of carriage 14 so that the lifting arm can be positioned proximate carriage 14 with stud 46 protruding through a selected aperture 48. In this position apertures 44 formed in arms 42 will align with apertures 50 provided in housing 28 at a plurality of vertically spaced apart locations (Figure 2). The lifting arm may be locked into position relative to the carriage by inserting a locking pin 52 through apertures 44 and apertures 50. A locking means in the form of a small protuberance 54 positioned intermediate the ends of locking pin 52 prevents accidental withdrawal of the pin.

As best seen by referring to Figures 2, 3 and 4, connecting column 24 is substantially "U" shaped in configuration, is closely receivable in apertures 55 formed in each weight 22 and is affixed at its upper end to the lower end of carriage 14. A plurality of vertically spaced apart keyhole shaped apertures 56 adapted to closely receive a second locking pin 58 are formed along the length of the connecting column. As indicated in Figure 2, each of the weights 22 is also apertured to closely receive a locking pin 58. Apertures 56 in column 24 are arranged to index with the apertures 60 in weights 22 when the connecting column is in its lowermost position. With this construction, pin 58 may be inserted into a selected aperture in colum 24 and will extend through the weight aligned therewith. In this way, one or more weights may readily be interconnected with connecting column 24 so that as carriage 14 is raised through exertion of an upward force on handle bar 40, the weights in the weight stack above pin 58 will also move upwardly relative to central column 16. Pin 58 is also provided with a protuberance 59 located intermediate its ends to prevent accidental withdrawal of the pin.

An important and novel feature of the present invention comprises third guide means provided in guide column 16 for guiding the vertical travel of connector column 24. In the present form of the invention, the third guide means comprises a track 60 affixed to the rear surface of the guide column (Figures 3 and 4). Track 60 has a pair of vertically extending spaced apart channels 62 adapted to slidably receive inturned end portions 64 formed on the side walls of connector column 24. Although not shown in the drawings, other equivalent types of guide means such as cooperating rollers, slides and the like could, of course, also be used to operably interconnect column 24 and central guide column 16.

Turning now to Figures 5 and 6 there is illustrated an alternative embodiment of the exercising apparatus of the present invention. This embodiment is similar in most respects to the embodiment previously described herein save for the construction of the body engaging means and its method of attachment to the reciprocative carriage. In the drawings, like numbers are used to identify like parts. As was the case in the previously described embodiment, carriage 70 is generally "U" shaped in cross-section and is stradled by spaced apart arms 72 affixed to the handle bar, or lifting arm, 74 of the apparatus. As indicated in Figure 5, the entire body engaging means including transversely spaced apart arms 72 lies in a single plane rather than being angularly inclined as was the case in the previously described embodiment. Additionally, in this form of the invention, the body engaging means is both vertically adjustable and pivotally movable relative to the carriage. Accordingly, the vertical starting height of the body engaging means can be adjusted relative to the carriage by vertical movement of arm 74, and also by pivoting the arm with respect to the carriage into different angular orientations. As best seen in Figure 5, the carriage is provided with a plurality of spaced apart pairs of slots 75 formed in the rear edges of "U" shaped member 70. These slots are

adapted to closely receive a transverse pin 76 which is fixedly positioned within apertures 77 formed proximate the inboard ends of arms 72 of the body engaging means (Figure 6).

To position the body engaging means at a selected vertical height, pin 76 is first introduced into one of the pairs of slots 75 in member 70. To enable the lifting bar to be adjusted to a selected angle relative to the carriage, arms 72 have apertures 78 formed intermediate their ends which are adapted to closely receive a second locking pin 80 which may be inserted into the aperture and extend through one of several apertures 82 formed in the side walls of "U" shaped member 72. As illustrated in Figure 5, apertures 82 are located along an arc of a circle so that as the body engaging means pivots about pin 76 the apertures in side arms 72 will align with a set of apertures 82 formed in the side wall of member 70.

In operating the apparatus of the invention, the trainee first adjusts the body engaging means relative to the carriage so that the handle bar grips are positioned at the correct vertical starting height for the particular exercise to be performed. Next, the trainee inserts selector pin 58 into the proper aperture in a given weight 50 to interconnect the desired number of weights with the connective column 24. He thereupon, by exerting upward pressure on the handles 40c raises the carriage 14, the connecting column 24 and the weights located above pin 58. This lifting force tends to apply an eccentric force to the carriage. However, due to the design of the bearing or roller means of the carriage and the cooperating guide means of the central guide column this tendency is effectively overcome so that the carriage travels in substantially a vertically straight line.

It is important to observe that as the carriage moves upwardly and downwardly, the central guide column not only constrains the path of travel of the carriage, but also of the connecting column 24 and the weights 22. The single central guide column construction of the apparatus is highly novel and provides a mode of operation which was heretofore unknown in exercise equipment. The unique configuration of the device minimizes the number of component parts required, markedly reduces the weight of the unit and ensures safe, positive, reliable and trouble free operation.

CLAIMS

1. An exercising apparatus, comprising:
(a) a vertically reciprocative carriage, having first and second vertically spaced apart bearing means;
(b) a substantially vertically disposed central guide column having first and second guide means for guiding the first and second bearing means of the carriage;
(c) body engaging means projecting laterally outward from the carriage for moving the carriage upwardly relative to the central guide column; and
(d) biasing means for biasing the carriage against upward movement.

2. An exercising apparatus according to Claim 1, in which the biasing means comprises a plurality of weights disposed substantially directly below the carriage, the apparatus further including selector means operably associated with the carriage and adapted to be releasably interconnected with at least one of the weights for raising the weights upon upward movement of said carriage.

3. An exercising apparatus according to Claim 2, in which each of the weights is provided with an aperture adapted to closely receive the central guide column and the selector means whereby one of the central guide column and the selector means will guide vertical travel of said weights.

4. An exercising apparatus according to Claim 2 or 3, in which the selector means comprises a substantially vertically disposed connecting column connected to the carriage and closely receivable within and guided by the apertures of the weights.

5. An exercising apparatus, comprising:
(a) a vertically reciprocative carriage, having first and second vertically spaced apart roller means;
(b) a substantially vertically disposed central guide column having first and second guide means for guiding the first and second roller means of the carriage;
(c) body engaging means projecting laterally outward from the carriage for moving the carriage upwardly relative to the central guide column;
(d) a plurality of weights disposed substantially directly below said carriage, each of the weights having a centrally located aperture, the aperture being adapted to receive the guide column; and
(e) a substantially vertically disposed connecting column connecting to the carriage and adapted to be selectively connected to the weights whereby the carriage is biased in a vertically downward direction, the connecting column being closely receivable in the aperture formed in the weights.

6. An exercccsing apparatus according to Claim 5, in which the first guide means comprises a front surface of the central column and the second guide means comprises a rear surface of the central column, said front and rear surfaces being engageable by first and second vertically spaced apart roller means of the carriage.

7. An exercising apparatus according to Claim 6, in which each of the first and second roller means comprises upper and lower rollers one of said upper and lower rollers being in rolling engagement with the front surface of the central column and the other being in rolling engagement with rear surface of the central column.

8. An exercising apparatus according to Claim 7, in which each of the upper and lower rollers comprises two sets of coaxial rollers one set being in rolling engagement with the front surface of the central column and the other set being in rolling engagement with the rear surface of the central column.

9. An exercising apparatus according to any one of Claims 5 to 8, in which the central guide column is provided with third guide means for guiding vertical travel of the connecting column.

10. An exercising apparatus according to any one of Claims 5 to 9, in which the body engaging means include handle portions vertically adjustable

relative to the carriage.

11. An exercising apparatus according to any one of Claims 5 to 10, in which the body engaging means is removably connected to the carriage and in which the carriage includes body engaging locating means for locating the body engaging means in at least two vertically spaced apart locations on the carriage.

12. An exercising apparatus, comprising:

(a) a vertically reciprocative carriage including a housing and vertically spaced apart roller means mounted internally of the housing;

(b) a substantially vertically disposed central guide column having first and second guide surfaces, the first and second roller means of the carriage engaging and rolling along the first and second guide surfaces respectively;

(c) body engaging means projecting laterally outwardly from the carriage for engagement by a trainee to impart vertically reciprocative movement to the carriage, whereby a lifting force exerted on the body engaging element tends to apply an eccentric force to the carriage, the roller means being adapted to counteract the tendency to apply the eccentric force;

(d) a plurality of apertured weights, each provided with a centrally disposed aperture, the aperture being arranged to closely receive the central guide column; and

(e) selector means receivable within the aperture of the weights for selectively interconnecting the carriage and the weights whereby the carriage is biased in a vertically downward direction.

13. An exercising apparatus according to Claim 12, in which the carriage is selectively adjustable relative to the selector means.

14. An exercising apparatus according to Claim 12 or 13, in which the housing of the carriage is provided with spaced apart locating apertures and in which the body engaging means is provided with first locking means receivable in the said apertures whereby the body engaging means can be positioned at selected vertical starting heights.

15. An exercising apparatus according to Claim 14, in which the body engaging means is pivotally movable into various angular orientations relative to the carriage.

16. An exercising apparatus according to Claim 15, in which the body engaging means is provided with second locking means for locking it relative to the carriage in at least one selected angular orientation.

17. An exercising apparatus, comprising:

(a) a vertically reciprocative carriage;

(b) a plurality of weights disposed substantially directly below said carriage, each of the weights having a centrally located aperture;

(c) a substantially vertically disposed connecting column connected to the carriage and adapted to be selectively connected to the weights whereby the carriage is biased in a vertically downward direction, the connecting column being closely receivable in the aperture formed in the weights;

(d) a substantially vertically disposed central guide column closely receivable in the aperture formed in the weights, the central guide column having:

(1) first guide means for guiding the carriage;

(2) second guide means for guiding the carriage; and

(3) third guide means for guiding vertical travel of the connecting column as the carriage reciprocates; and

(e) body engaging means projecting laterally outward from the carriage for moving the carriage upwardly relative to the central guide column.

18. An exercising apparatus according to Claim 17 in which the first guide means comprises a front surface of the central column and the second guide means comprises a rear surface of the central column, the front and rear surfaces being engageable by the first and second vertically spaced apart roller means.

19. An exercising apparatus according to Claim 17 or 18, in which the third guide means comprises connecting column engaging means provided on the rear surface of the central guide column for guidably engaging the connecting means upon vertical reciprocative movement of the carriage.

20. An exercising apparatus, comprising:

(a) at least one weight hhaving a centrally disposed aperture formed therein;

(b) a substantially vertically disposed, reciprocally movable connecting column connected to the weight whereby the connecting column is biased in a vertically downward direction, the connecting column being receivable in the aperture formed in the weight;

(c) a substantially vertically disposed central guide column receivable in the aperture formed in the weight; and

(d) laterally projecting body engaging means operably associated with the connecting column for moving the connecting column upwardly relative to the central guide column against the urging of the weight.

21. An exercising apparatus according to Claim 20, in which the body engaging means is selectively engageable relative to the central guide column.

22. An exercising machine according to Claim 20 or 21, in which the body engaging means includes bearing means adapted to engage the central guide column.

23. An exercising apparatus according to Claim 20, including a vertically reciprocal carriage having vertically spaced apart bearing means adapted to engage the central guide column, the carriage being connected to the connecting column and to the body engaging means.

24. An exercising apparatus substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

Printed for Her Majesty's Stationery Office by Croydon Printing Company Limited, Croydon Surrey, 1980.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.