MULTIPLE USE EXERCISING DEVICE

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References Cited

UNITED STATES PATENTS

3,072,400 1/1963 Dykinga 272/81 X

OTHER PUBLICATIONS


A unitary exercise machine having a single set of weights but permitting a wide range of progressive resistive exercises is provided for home or apartment use. The apparatus has members that are telescoped between the ceiling and the floor to provide stability during an exercise program. Two pulley systems are employed in alternation to transmit the lifting force of the weights to an over-the-head bar and to a station near the floor for lower torso exercises. The latter pulley system is connectable with a press bar in the middle region of the machine for the completion of squats, curls and the like. Noise absorbers are placed on individual pin-held weights and the bulk of the machine is minimized to make it suitable for home or apartment use. The machine has a support frame with cross bracings that are in non parallel planes. At an exercising station there is mounted a slip-on boot that engages a user’s ankle while the latter is performing an exercise.

9 Claims, 8 Drawing Figures
MULTIPLE USE EXERCISING DEVICE

This invention relates to a body conditioning and exercising apparatus and, more particularly, relates to a unitary exercise apparatus on which a wide range of progressive resistive exercises may be undertaken and which may be conveniently and semi-permanently installed and used in an apartment or home without altering or damaging floors, walls or ceilings.

BACKGROUND OF THE INVENTION

The value of exercise as a means of maintaining good health and youthful appearance is now widely recognized. The ever increasing national interest in such activities as jogging, bicycling, and hiking plus the growing number of health clubs, reducing salons, and exercise rooms in motels serve to illustrate this recognition. And the President of the United States has encouraged active participation in such activities for the good of the nation and its people.

According to Dr. Lawrence A. Golding and Dr. Ronald R. Bos of the Department of Physical Education at Kent State University in their treatise “Scientific Foundations of Physical Fitness Programs” muscular strength, muscular endurance, and cardiovascular endurance are considered the hard core of physical fitness. According to their research, running is the best activity for developing cardiovascular fitness while the most effective activity for muscular strength and muscular endurance is progressive resistive exercise, or weight training.

The tremendous effectiveness of weight training for the development of muscular strength and muscular endurance has been most dramatically illustrated by professional weight lifters and body builders who have developed their muscles to enormous proportions in size, strength and endurance. Unlike calisthenics, weight training is not limited to push-ups and various flexibility exercises. An unlike isometric contraction, which according to Dr. Golding and Dr. Bos develops strength only at specific points in the range of motion of a joint and alone without complementary activity will do little for muscular endurance and may actually be detrimental flexibility, weight training develops strength throughout the full range of motion of a joint by increasing the resistance (weight), develops muscular endurance by increasing the number of repetitions, and according to some experiments actually seems to improve one’s motor coordination.

Weight training equipment now in existence leaves much to be desired, however, particularly in the areas of convenience and expense. Conventional weights, i.e. barbells and dumbbells, are relatively inexpensive but are a nuisance to use. In a close living situation dragging the weights out of the closet and changing the weights by fastening and unfastening clamps and removing or adding difficult-to-handle plates is not only a nuisance but can actually be dangerous. As Dr. Golding and Dr. Bos note most of the time spent in weight training routines is used in activities other than actually lifting the weights. Furthermore, in order to achieve the full range of exercises necessary for maximum benefit from conventional weights, it is necessary to add a formidable array of expensive and space-consuming accessories. For example, reference may be had to U.S. Pat. No. 2,932,509 issued to Zinkin.

In addition to conventional weights certain apparatus have been developed which alleviate the weight-changing nuisances associated with barbells and dumbbells through the use of cable-pulley systems or lever systems in conjunction with stacks of pin-held weights. Such apparatus now in existence achieve their stability through inherent overall weight and/or by being bolted to a floor or wall, which is acceptable for a gymnasium or health club but highly unsuitable for a home or apartment. For example, reference may be had to U.S. Pat. No. 3,614,097 issued to Blickman. Furthermore, such apparatus now in existence achieve a full range of exercises only through the employment of several “stations”, each “station” having its own stack of pin-held weights and its own limitations as to the number and variety of exercises which may be performed, again making it suitable for a gymnasium but impractical, too space-consuming, and too expensive for home or apartment use.

The nuisances associated with the use of conventional weights have caused thousands of good-intentioned home enthusiasts to become discouraged and give up on weight training programs every year. Many people all over the country do not have access to gymnasiums or clubs equipped with more modern apparatus. And even among people who do have access to such facilities, many are discouraged from active participation by the inconvenience and time involved in traveling to and from the facilities, the lack of privacy, and the expenses of membership fees, hiring babysitters, etc.

It is therefore an object of this invention to provide a unitary exercise machine which is telescoped in place between the ceiling and floor of a home or apartment to provide a stable structure on which heavy exercises can be performed.

It is a further object of this invention to provide a unitary exercise machine on which a full range of exercises may be performed but which utilizes only a single set of weights, is lightweight and is capable of being installed in a home or apartment.

It is a further object of this invention to provide a unitary exercise machine on which over-the-head exercises, lower torso exercises and press bar exercises may be performed.

It is a still further object of this invention to provide a unitary exercise machine on which a combination of levers and pulleys are used to provide the capability of performing progressive resistive exercises.

It is an additional object of this invention to provide a unitary exercise machine which can be readily disassembled for removal to a new location.

SUMMARY OF THE INVENTION

The invention comprises a unitary exercise machine for use in an apartment or home. The machine is contained within a lightweight upstanding frame. A single set of weights is stacked on upstanding poles within the frame. The weights are lifted up the poles by either of two simple pulley systems, one of which includes a lever, to produce forces at a number of stations so that a variety of progressive resistive exercises may be carried out.

To insure that the unitary exercise machine is sufficiently stable to permit the performance of significant progressive resistive exercise it is telescoped between the ceiling and the floor by a telescope means which
pushes a ceiling plate attached to the upstanding frame against the ceiling. Since the machine is telescoped inbetween the ceiling and the floor forces and stresses which would tend to cause the machine to vibrate or to be displaced along the floor or which would tend to damage the machine are communicated to either the ceiling or the floor. In the preferred embodiment, the frame is cross braced to transmit the forces more evenly to either the floor or the ceiling plate.

A movable bar is positioned across the upper end of the frame of the unitary exercise machine to permit separate pulley systems to be alternately positioned over the center of gravity of the stacked set of weights. The first pulley system is connected to an over-the-head bar to permit over-the-head pulling exercises to be performed. The second pulley system transmits the lifting force of the weights by a guy wire through a series of pulleys to a terminal at the bottom of the unitary exercise machine to permit foot exercises and lower torso exercises to be performed. The second pulley system may be further connected to transmit the lifting force of the weights to a level positioned in the middle region of the unitary exercise machine so that press bar progressive resistive exercises such as squats and military presses may be performed.

BRIEF DESCRIPTION OF THE DRAWINGS

For further comprehension of the unitary exercise machine of the present invention reference may be had to the drawings which are incorporated herein and in which:

FIG. 1 is a perspective view of the unitary exercise machine;
FIG. 2 is a side view of the unitary exercise machine;
FIG. 3a is a plan view of the upper pulley bar with the stack of weights shown in phantom underneath and with the center pulley of the overhead pulley system positioned over the center of gravity of the stacked weights;
FIG. 3b is a plan view of the upper pulley bar with the stacked weights shown in phantom underneath and with the center pulley of the lower pulley system positioned over the center of gravity of the stacked weights;
FIG. 4 is an end view of a slip-on boot which may be used in conjunction with the lower pulley system to accomplish foot exercises;
FIG. 5 is a plan view of the slip-on boot of FIG. 4;
FIG. 6 is a perspective view of an individual stackable weight with attached noise absorbers; and
FIG. 7 is a side section view of a telescoping mechanism capable of being incorporated in the unitary exercise machine and illustrating both a gross pin adjustment and vernier adjustment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

By reference now to FIG. 1 it can be seen that the unitary exercise machine is a compact unit contained substantially within the confines of upstanding tubular frame 16, base plate 11 and ceiling plate 12. The traverse of guy wire 40 around base pulley 42 and center pulley 36 forms a first pulley system which can be attached at one end to stacked weights 8 and at the other end to guy wire 24 for attachment to cross bar 25 of press bar 26 or may be attached to external attachments for the performance of lower-leg exercises. The traverse of guy wire 31 around front pulley 34 and center pulley 35 forms a second pulley system which can be attached at one end to stacked weights 8 and at the other end to overhead bar 30.

It is evident from reference to FIGS. 1 and 2 that the two pulley systems are connected to stacked weights 8 interchangeably. If it is desired to accomplish lower-leg exercises or to use press bar 26, then the first pulley system is connected to stacked weights 8. If it is desired to accomplish over-the-head exercises, then the second pulley system is connected to the stacked weights 8. Stacked weights 8 consist of a number of individual weights stacked on upstanding poles 9. Connection of either pulley system to stacked weights 8 is accomplished by slipping the hook, e.g. hook 33 on guy wire 31, through the ring on the upper end of connector rod 5. Connector rod 5 passes through the stacked weights 8 so that, in operation, the number of weights picked up may be varied by inserting removable pin 6 through removable pin channel 7 in an individual weight and thence through an aligned bore in the connector rod 5. This feature is particularly desirable in a unitary exercise machine since the proper accomplishment of the great variety of exercises requires that a wide range of weights be available. For example, foot exercises would probably require only a portion of the lifting force which over-the-head exercises would require. Also, in a unitary exercise machine for home use it is desirable that men and women of all ages be able to use the machine so that a wide range of weights is necessary.

The availability of the first and second pulley systems and the simple lever formed by press bar 26 makes it possible to perform a wide variety of exercises with a single set of weights. Utilizing a single set of weights is desirable since for home or apartment use the size of an exercise machine should be kept at a minimum as available space is limited. This requires that not only a single set of weights preferably be used but that the bulk of the machine itself be minimized. The bulk may be minimized by using thin-gage, tubular steel or lightweight alloys and by reducing generally the circumferential dimensions of the machine. Structural strength is enhanced by employing parallel horizontal bracing 17 and 18 and by employing cross bracing 15 and 16. Strong lightweight fittings are used at the junctions of vertical tubular sections 13 and 14 with horizontal bracing 17 and 18, and with cross bracing 15 and 16. In achieving the minimization of bulk, however, the machine itself is rendered less stable and is subject to the generation of undue vibration or to being displaced across the floor when the machine is being used to accomplish exercises.

Stability is provided for the unitary exercise machine of the present invention by utilizing a series of telescoping sections 19, shown in FIG. 1, which permit a ceiling plate 12 to be firmly and precisely pushed against the ceiling of the home or apartment in which the unitary exercise machine is utilized. The firm positioning of the unitary exercise machine between the floor and the ceiling prevents it from vibrating or from being displaced across the floor when exercises are being performed. As a practical matter, it is desirable that ceiling plate 12 be fabricated from a material which will not damage or discolor the ceiling. An appropriate mechanism to accomplish the telescoping function is illustrated in FIG. 7. Tubular, vertical support 60 is perfo-
rated with holes 64. Vertical extension 65 has a smooth cylindrical surface on the bottom and has bores perpendicular to and intersecting the axis thereof. When a bore 61 in vertical extension 65 is aligned with a hole 64 in tubular vertical support 60 a bolt 62 may be inserted through the aligned holes and bore and may be held in place by butterfly nut 63. If extra strength is desired, corresponding bolts may be slipped through other aligned holes 64 and bores 61. Upper threaded section 69 of vertical extension 65 will then be close to but not touching ceiling plate 12. Screw-on cap 66 with internal threads 68 which are mated with external threads 69 on the upper section of vertical extension 65 may then be turned counter-clockwise until it rests securely against ceiling plate 12. As shown, conical seat 67 receives screw-on cap 66. Thus, a gross adjustment may be made by selecting the appropriate alignment between holes 64 and bores 61 and a vernier or fine adjustment may be made by turning screw-on cap 66 counterclockwise until the ceiling plate 12 is pressed firmly against the ceiling. The effect of using a plurality of telescoping sections 19, each with a gross and vernier adjustment, is to push the ceiling plate against the ceiling so that the unitary exercise machine is firmly held between the floor and the ceiling.

The versatility of the unitary exercise machine is demonstrated by a description of the exercises that may be carried out thereon. When the second pulley system is connected to connector rod 5 which passes through the stacked weights 8, overhead bar 30 may be used to perform a variety of progressive resistive exercises which build up the upper torso. The hands of the exerciser can be used to grip overhead bar 30 near guy wire 31 or at the outer edges if it is desirable to build up the shoulder muscles. In the latter case handle grip 29 prevents the exerciser’s hands from slipping off the overhead bar. In this mode guy wire 31 is connected to stacked weights 8 and guy wire 40 is slipped through storage ring 32. On the other hand press bar progressive resistive exercises such as squats, curls and military presses may be performed if the second pulley system is utilized and hook 44 of guy wire 24 is attached to ring 41 of guy wire 40 at base pulley 42. In this mode hook 33 of guy wire 31 is slipped through storage ring 32. It should be noted that shoulder bar 28 and press bar handle 27 of press bar 26 should extend beyond support ledge 4 of base 11 of the unitary exercise machine so that the exercises may be carried out without interference from base 11. In fact the end 3 of support ledge 4 of base 11 may be used as a point of support for the foot or heel of the exerciser. Finally, a number of lower torso exercises may be accomplished by using the first pulley system and attaching an external device such as the boot 50 shown in FIGS. 4 and 5. Or, a straight bar can be used to permit rowing or situp type exercises to be performed. To perform these exercises the exerciser would most likely sit on the floor or on a stool in front of the machine and use end 3 of support ledge 4 of base 11 as a point of support for the sole of the foot.

The ability to utilize two separate pulley systems, thereby eliminating bulk, is made possible in the embodiment shown in FIG. 1 by a dual position swivel mounted upper pulley bar 37 which permits alternatively, center pulley 36 of the first pulley system and center pulley 35 of the second pulley system to be positioned directly above the center of gravity of stacked weights 8. It is important that the given pulley system that is in use be positioned accurately over the center of gravity of the stack of weights so that undue stresses are not created within the structure of the machine when exercises are being carried out. As shown in FIGS. 3a and 3b, a minor shift in the position of upper pulley bar 37 will result in the requisite adjustment of the respective positions of center pulleys 35 and 36. In FIG. 3a, the second pulley system mode, the interior edge of center pulley 35 is positioned directly above the center of gravity of stacked weights 8, shown in phantom. When the position of upper pulley bar 37 is shifted to the left as shown in FIG. 3b, the first pulley system mode, the interior edge of center pulley 36 is positioned over the center of gravity of the stacked weights 8. The two positions shown in FIGS. 3a and 3b are positively maintained by spring loaded pin 43 which seats in precisely located holes in cross support brace 45. In both modes the guy wire which traverses the center pulley will be connected to the vertical connector rod 5 which passes through stacked weights 8 as shown in FIG. 1.

Foot exercises are often neglected in exercise programs because there is no convenient way to grip a guy wire with the feet or there is no station available that is convenient for foot exercises. Also, leg lifts which require the exerciser to lie on his back and push weights upwardly often cause back sprains. Since the unitary exercise machine of the present invention has a station available near the floor a suitable slip-on boot 50, shown in FIGS. 4 and 5, has been invented so that foot exercises may be conveniently and safely carried out. A contoured metal element 52 is partially encased in a padded covering 53 and extends therefrom to form a junction with sole plate 51. The inner surface of padded covering accommodates the ankle of a foot while the sole abuts sole plate 51. A connecting guy wire is attached to one of the rings 55 and thence to ring 41 of guy wire 40. A variety of foot exercises may be carried out depending upon which ring 55 is used and upon the position assumed by the exerciser.

For apartment house or home use it is desirable to reduce or eliminate the noise that is associated with most exercise machines. The clanking of metal weights is a sound that is familiar to all weight lifters and persons who frequent public gymnasiums. To avoid this problem, the individual weight 80 shown in FIG. 6 has noise absorbing straps 81 wrapped around its exterior. In another embodiment rubber ribs are used and in one embodiment plastic coated weights used.

While specific embodiments and features of the unitary exercise machine of the present invention have been disclosed herein the scope of this application for Letters Patent is intended to be limited solely by the scope and spirit of the appended claims:

1 claim:

1. A unitary and body conditioning exercise machine for use in an enclosed room said machine incorporating a single vertical stack of individual weights and permitting a wide range of exercises, comprising:
   an upstanding frame disposed to rest in a stable condition on a floor area and to extend upwardly to the vicinity of a ceiling;
   telescoping means for firmly communicating the upper end of said upstanding frame with the ceiling to firmly hold said frame in place between the floor and ceiling to permit a wide range of exercises to be carried out on said machine;
force translation means interconnecting a single vertical stack of individual weights with a plurality of progressive resistive exercise stations accessible exteriorly of said frame, said exteriorly accessible stations including a first station located near the bottom of said upstanding frame to permit the performance of lower torso exercises, said first station having means to transmit the lifting force of said multiple stacked weights to a press bar lever located in the intermediate region of said upstanding frame and a second station located near the upper end of said upstanding frame to permit the performance of over-the-head progressive resistive exercises, said force translation means comprising a first and second pulley system, said first pulley system incorporating a series of pulleys affixed to said frame and translating the lifting force of said single vertical stack of individual weights to said first station near the bottom of said upstanding frame, said first pulley system including a guy wire attached to said press bar, said guy wire being connectably disconnectable with said first station, and said second pulley system incorporating a series of pulleys affixed to said frame and translating the lifting force of said weights to said station near the upper end of said upstanding frame, horizontal pulley bar, said first and said second pulley systems each having respective center pulleys appended from said horizontal pulley bar swivel mounted on said frame, said pulley bar being movable orthogonally with respect to the vertical axis of said upstanding frame, said pulleys being appended so that the interior edge of each pulley can be placed, alternately, over the center of gravity of said single stack of weights.

2. A unitary body conditioning and exercise machine in accordance with claim 1 wherein said telescoping means includes a gross adjustment for positioning the upper end of said upstanding frame near the ceiling of said room and a vernier adjustment for precisely positioning the upper end of said upstanding frame against the ceiling of said room.

3. A unitary body conditioning and exercise machine in accordance with claim 1 wherein said horizontal pulley bar is movable between two fixed positions, the first of said positions placing the interior edge of the center pulley of said first pulley system, and the second position placing the interior edge of the center pulley of the second pulley system, respectively, over the center of gravity of the single stack of weights.

4. A unitary body conditioning and exercise machine in accordance with claim 1 wherein each of said weights in said single stack of weights have noise absorbers affixed to their exterior to prevent the individual weights from clanking together.

5. The unitary body conditioning and exercise machine of claim 4 in combination with a slip-on boot connectable with said first station, said slip-on boot comprising:

a curved padded member adapted to receive the ankle of a human foot;
a sole plate extending from said curved padded member and adapted to abut the sole of a human foot resting in said curved padded member; and
fastening means attached to said padded member and to said sole plate for selective attachment to a dis

6. A unitary body conditioning and exercise machine for use in enclosed rooms, comprising:

an upstanding frame including:

a base adapted to sit upon a floor;
at least three vertical members extending upwardly from the base to the vicinity of a ceiling;
a plurality of cross bracing members attached to said frame in non parallel vertical planes to provide added rigidity thereto;

ceiling mating means communicating with the vertical members for distributing torque acting from any direction adjacent the top of said vertical members over a substantial area of the ceiling generally above the frame; and

means for adjustably extending the height of said frame to firmly communicate said ceiling mating means against the ceiling generally above said frame to hold said frame in place between the floor and ceiling;
said exercise machine further comprising:

only one source of resistance located within said frame which acts against a force exerted by a user;
an exercise station adjacent said frame;
a pulley above said source; and

guy wire passing through said pulley and interconnecting said source of resistance with said station, said guy wire transferring a force exerted by said source of resistance generally downwardly within said frame and generally parallel to said vertical members.

7. A machine in accordance with claim 6 wherein said only one source of resistance to force exercised comprises a single stack of a plurality of weights.

8. A machine in accordance with claim 7, wherein said weights include absorbers to prevent the individual weights from clanking together.

9. A unitary body conditioning and exercise machine for use in enclosed rooms, comprising:

an upstanding frame including:

a base adapted to sit upon a floor;
at least three vertical members extending upwardly from the base to the vicinity of a ceiling;
a plurality of cross bracing members attached to said frame in non parallel vertical planes to provide added rigidity thereto;

ceiling mating means communicating with the vertical members for distributing torque acting from any direction adjacent the top of said vertical members over a substantial area of the ceiling generally above the frame; and

means for adjustably extending the height of said frame to firmly communicate said ceiling mating means against the ceiling generally above said frame to hold said frame in place between the floor and the ceiling;
said exercise machine further comprising:

only one stack of individual weights positioned vertically with respect to one another located within said frame which acts against a force exerted by a user;
an exercise station adjacent said frame; a pulley above said stack of weights; and a guy wire passing through said pulley and interconnecting said stack of weights with said station, said guy wire transferring a force exerted by said stack of weights generally downwardly within said frame and generally parallel to said vertical member.

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