United States Patent

Thiede

[15] **3,658,327**

[45] **Apr. 25, 1972**

[54] PULL TYPE EXERCISING DEVICE

[72] Inventor: **Clifford S. Thiede,** 1745 Obispo Avenue, Long Beach, Calif. 90804

[22] Filed: **Mar. 10, 1971**

[21] Appl. No.: **122,733**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 864,771, Oct. 8, 1969, abandoned.

[52] **U.S. Cl.**.....**272/79 R,** 272/DIG. 4, 182/116, 238/10 R, 272/58

[51] **Int. Cl.**.....**A63b 23/02,** A63b 23/04, A63b 23/00

[58] **Field of Search**.....272/79 R, 80, 81, 82, 83 R

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Primary Examiner—Richard C. Pinkham
Assistant Examiner—William R. Browne
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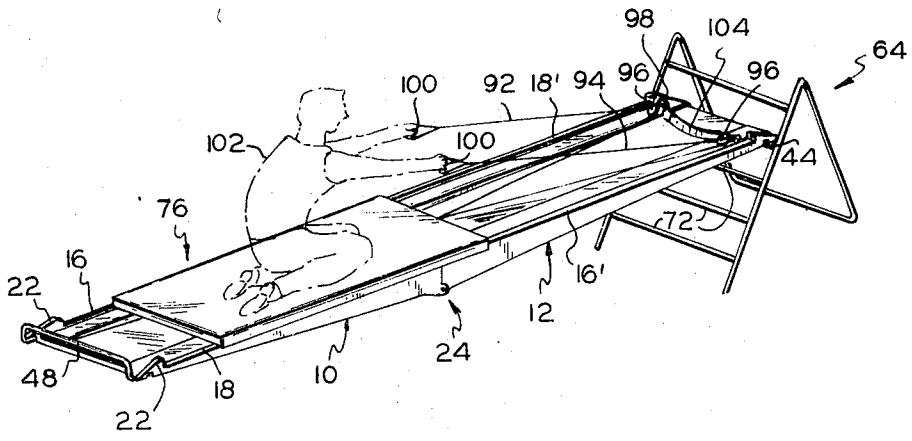
[57] **ABSTRACT**

A collapsible exercise device includes a pair of deck portions selectably disposed in extended end-to-end relation for use, and which may be stored or shipped in adjacent relation. One end of the extended deck is supportable on the ground or floor with the opposite end thereof detachably engaging a selectable rung of a support ladder. A carriage travels along rails on the extended deck, and the carriage is movable with respect to the deck by means of pulleys connected thereto.

12 Claims, 27 Drawing Figures



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SHEET 1 OF 4

FIG. 1

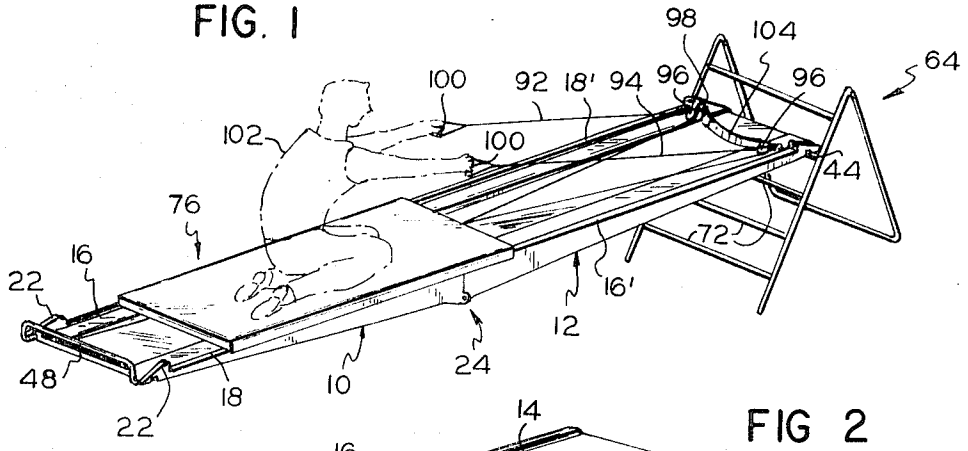


FIG 2

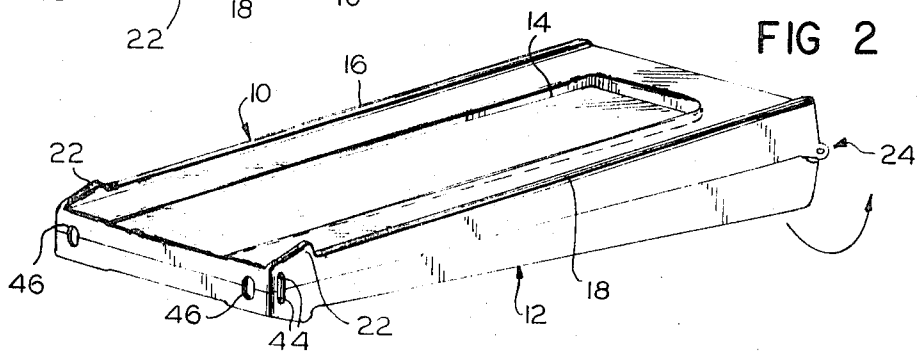


FIG. 3

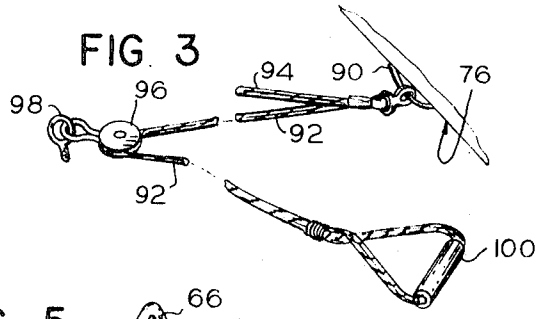


FIG. 4

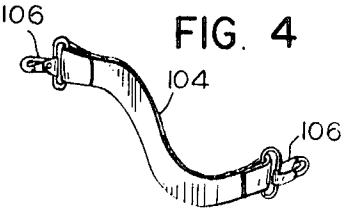


FIG. 5

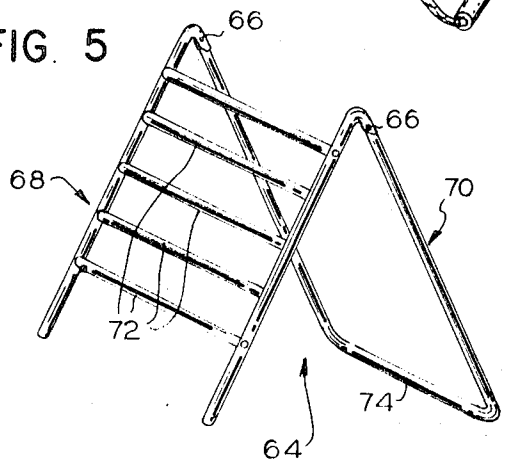
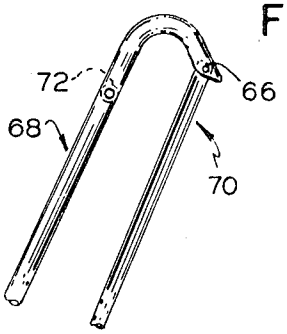


FIG. 6



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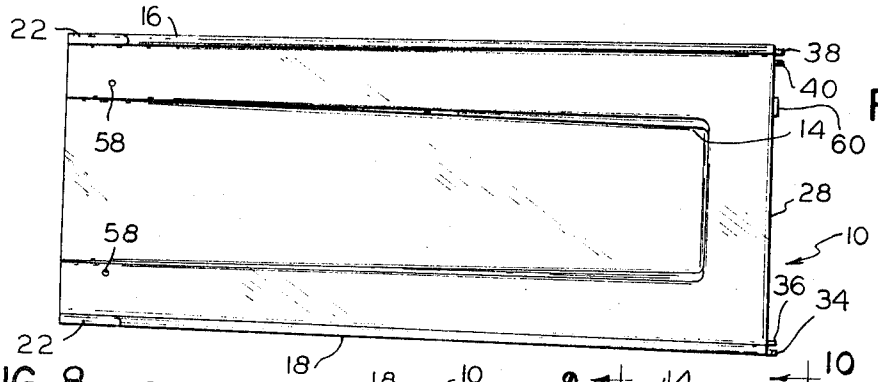


FIG. 7

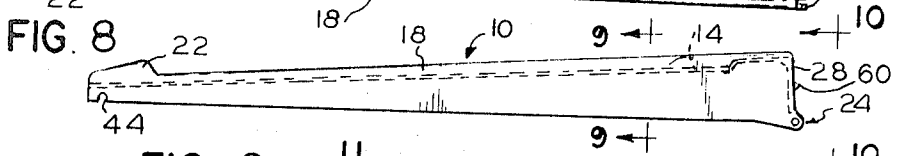


FIG. 8

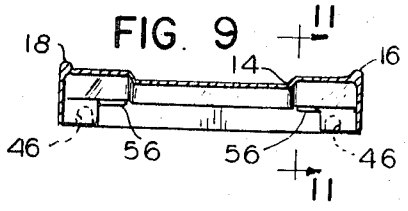


FIG. 9

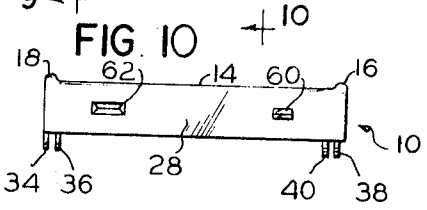
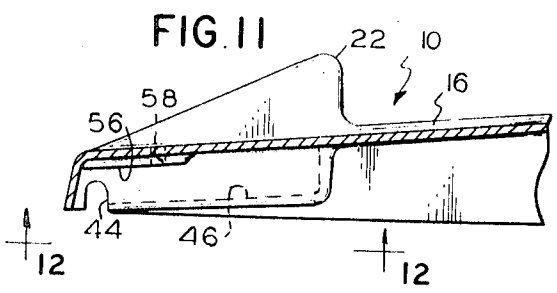


FIG. 10



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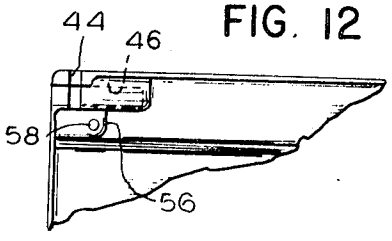

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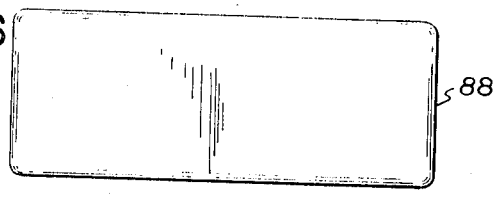

FIG. 16

FIG. 17

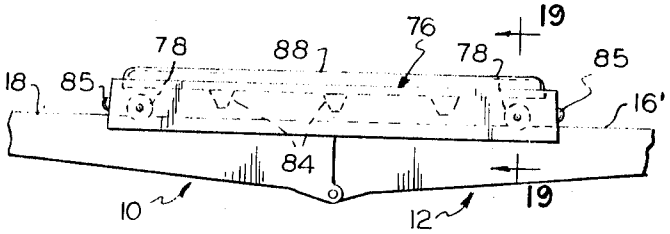

FIG. 15

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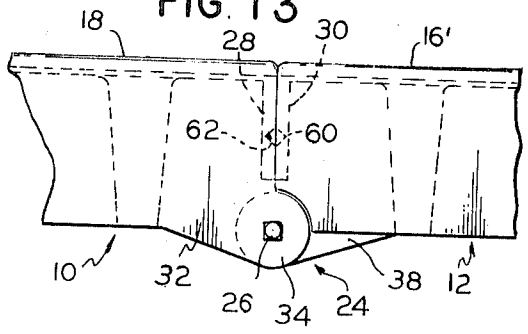
FIG. 13



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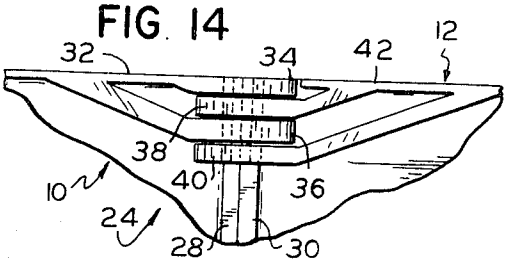

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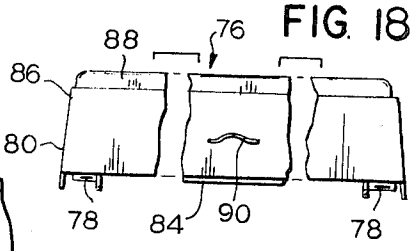

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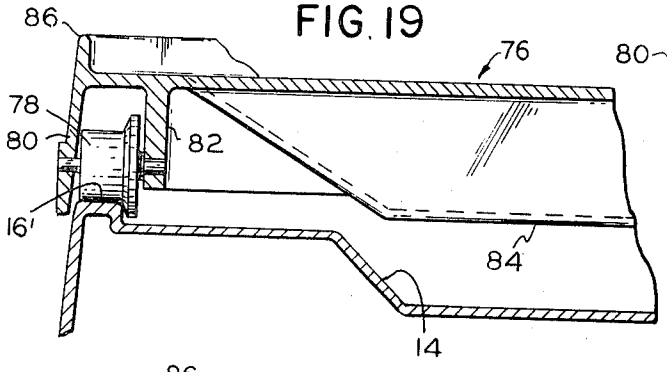
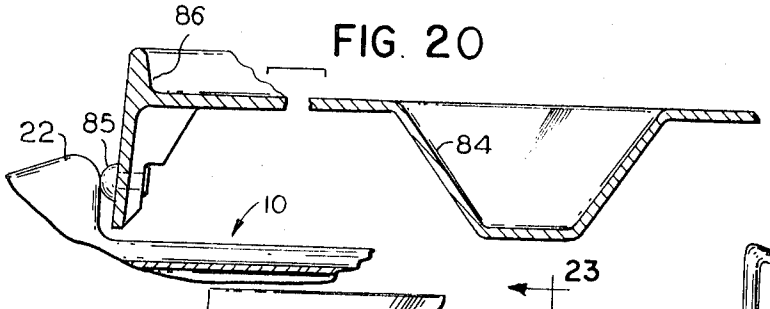


FIG. 20



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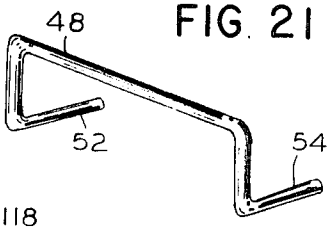

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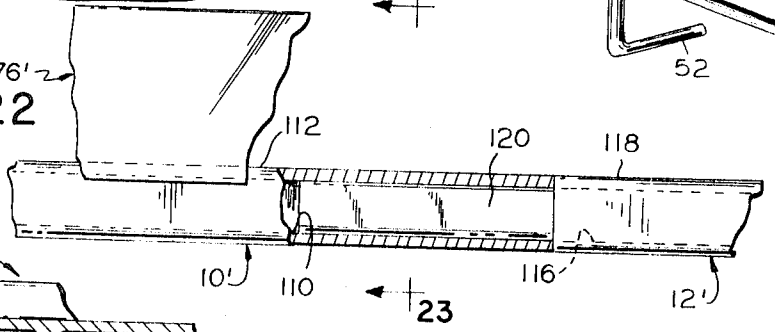

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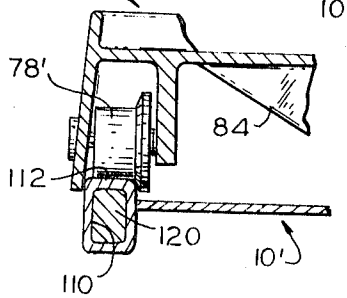

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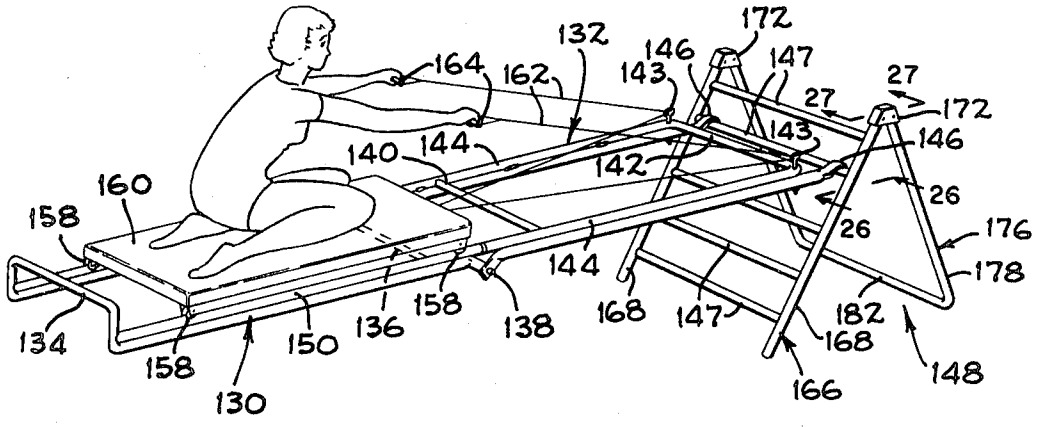
FIG. 24



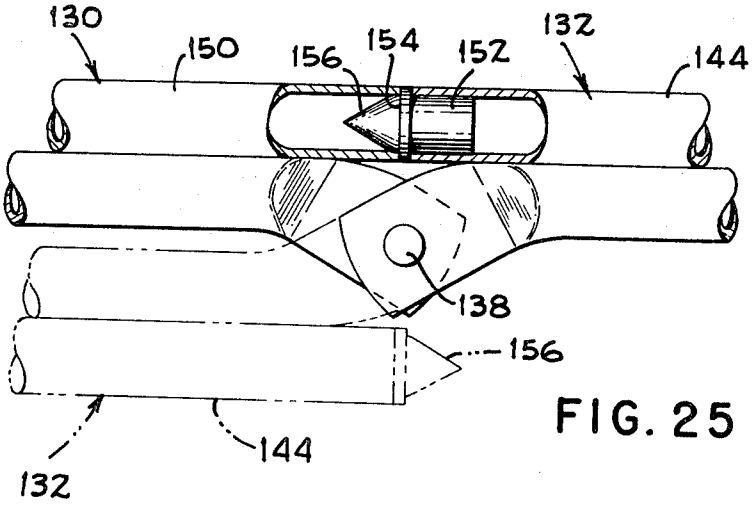


FIG. 25

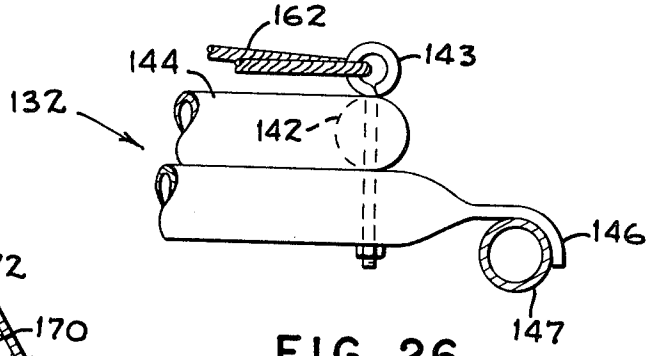


FIG. 26

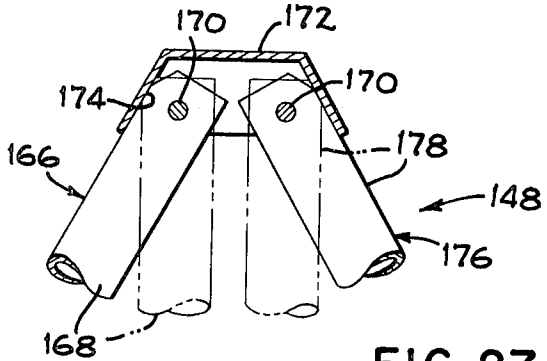


FIG. 27

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PATENT AGENT

PULL TYPE EXERCISING DEVICE

This application is a continuation in part of applicant Ser. No. 864,771, filed Oct. 8, 1969 and since abandoned.

BACKGROUND OF THE INVENTION

Various available in-place exercise machines are designed to provide beneficial exercise to different muscles of the body. One example is a rowing machine having frictionally restrained oars. Another machine comprises a weight and pulley apparatus attached to the wall, wherein the individual exercising grasps handles connected with lines for moving the weights. Other machines in this general category will occur to those familiar with the art. The major disadvantage with most apparatus of this type is the permanency of the installation generally required. The equipment is usually heavy and cumbersome and likely to be quite expensive in initial cost and installation. If weights are involved, these weights necessarily add to the expense, size, permanency, and overall weight of the device. Apparatus has been proposed previously by means of which an individual pulls or rows against his own weight for avoiding a permanent installation on a wall, floor, or the like. However, most apparatus heretofore proposed is still inclined to be very heavy and cumbersome, and is not of a size, shape, or weight which one usually associated with being portable.

SUMMARY OF THE INVENTION

According to the present invention, an exercise device comprises a pair of light weight deck portions which together form a substantially reinforced deck. The deck portions are either hinged together or are detachably joined together employing reinforcing structural members disposed in aligned sockets in the deck portions. In the case of a hinged construction, the hinge axis is located at a distance from the surface of the deck so as to provide enhanced structural support for the deck in its extended relation. The resulting deck is provided with slots engageable with rungs of a support ladder whereby the deck may be inclined at a predetermined angle. The deck portions are suitably of channel-shaped, molded plastic or metal construction having aligned rail portions along which a light weight molded plastic or metal carriage is adapted to travel. The carriage and extended deck are interconnected by pulley means whereby a person, supported on the carriage, can move himself along the inclined deck, pulling against the weight of this own body. Innumerable exercises are possible with this device, as determined by the relation of the user's body with the apparatus. The device is quite portable, is of low weight, and can easily be shipped or stored. The deck portions are foldable into adjacent relation, and the aforementioned support ladder is also collapsible into a generally flat configuration. Together with a relatively short carriage, these components together form a relatively short, flat, low weight package for transporting or storage without difficulty.

It is accordingly an object of the present invention to provide an improved exercise device of low weight and collapsible construction by means of which a relatively large number of body exercises may be performed.

It is a further object of the present invention to provide an improved exercise device of maximum versatility, minimum weight and expense, and which requires no permanent installation, but which can be easily transported from place to place.

It is another object of the present invention to provide an improved exercise device wherein an individual exerts muscle force against the weight of his own body by pulling or otherwise propelling his body along an inclined deck on a carriage mechanism, wherein said exercise device is portable in nature, being easily collapsible for shipment or storage.

The subject matter which I regard as my invention is particularly pointed out and distinctly claimed in the concluding portion of this specification. The invention, however, both as to organization and method of operation, together with further advantages and objects thereof, may best be understood by reference to the following description taken in

connection with the accompanying drawings wherein like reference characters refer to like elements.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an exercise device according to the present invention;

FIG. 2 is a perspective view of a first and second deck portions of the FIG. 1 device in folded together relation;

FIG. 3 is a detail drawing of a line and pulley system forming a part of the exercise device of the present invention;

FIG. 4 is a toe strap employed with the present invention;

FIG. 5 is a perspective drawing of a support ladder forming a part of the exercise device according to the present invention;

FIG. 6 is a detail drawing of a portion of FIG. 5 supported ladder;

FIG. 7 is a plan view of a deck portion according to the present invention;

FIG. 8 is a side view of the FIG. 7 deck portion;

FIG. 9 is a cross-sectional view of a deck portion according to the present invention taken at 9—9 in FIG. 8;

FIG. 10 is an endview of a deck portion according to the present invention taken at 10—10 in FIG. 8;

FIG. 11 is a cross-sectional view taken at 11—11 in FIG. 9;

FIG. 12 is a partial lower view of the aforementioned deck portion taken at 12—12 in FIG. 11;

FIG. 13 is a side view of hingedly connected deck portions according to the present invention;

FIG. 14 is an underneath view of the FIG. 13 hinged connection, looking upward in FIG. 13;

FIG. 15 is a partial side view of the extended deck according to the present invention provided with a traveling carriage thereupon;

FIG. 16 is a top view of a cushion for the carriage according to the present invention;

FIG. 17 is a partially broken away edge view of the FIG. 16 cushion;

FIG. 18 is an end view of the carriage according to the present invention;

FIG. 19 is a cross-sectional view of a carriage and deck according to the present invention taken at 19—19 in FIG. 15;

FIG. 20 is a longitudinal cross-sectional view of a carriage and deck according to the present invention with the carriage engaging a deck bumper;

FIG. 21 illustrates a foot bar which may be employed with the present exercise device;

FIG. 22 is a partial cross-sectional view of an alternate deck construction according to the present invention;

FIG. 23 is a detail of the FIG. 22 construction taken at 23—23 in FIG. 22; FIG. 24 is a perspective view similar to FIG. 1, of a modified exercise device embodying the invention;

FIG. 25 is an enlarged fragmentary view of a hinge arrangement constituting a part of the FIG. 24 structure;

FIG. 26 is another enlarged fragmentary view, taken along line 26—26 of FIG. 24; and

FIG. 27 is an enlarged sectional view of a hinge arrangement of the support ladder taken along line 27—27 of FIG. 24.

DETAILED DESCRIPTION

Referring to the drawings, the exercise device according to the present invention comprises a deck formed of a pair of light weight, extensible deck portions 10 and 12, which are hinged together in the embodiment of FIG. 1 through 21. When not in use, the deck portions may be folded together as illustrated in FIG. 2 as for shipping, storage, and the like. The deck portions 10 and 12 are desirably identical and may be molded from fiber glass plastic material or the like to provide a generally flat overall top shape or may be formed of light weight pressed aluminum. Although flat in general, the deck portions are individually contoured or channeled for reinforcing purposes and for providing rail portions upon which a movable carriage may travel. Thus, deck portion 10 is in-

dented or dished out in channel fashion toward its hinged end form it opposite end as illustrated at **14** in FIG. **2**, and is also channeled to provide upraised side rails **16** and **18**. The side rails are straight except for additionally upraised bumpers **22** at the non-hinged end of the deck portion. The elements of deck portion **12** are substantially identical to those of deck portion **10** and referred to herein employing primed reference numerals.

Hinge **24**, best illustrated in FIGS. **13** and **14**, includes an axle pin **26** engaging both deck portions **10** and **12**, wherein the axis of the pin **26** is disposed below the rail portions **18** and **16'** in FIG. **13**, and preferably below the longitudinal center line of deck portions **10** and **12** with the deck portions extended in unfolded and aligned relation. In particular, the hinge axis is located at the lower edge of the deck, and the deck portions are thicker, that is their sides are wider, toward the hinge location to place the hinge axis at a distance from the rail portions. The deck portions **10** and **12** include end walls **28** and **30**, respectively, which disposed in abutting relation when the deck portions are unfolded, whereby the structural construction comprising hinge **24** and end walls **28**, **30** may hold the deck portions in aligned and rigid relation in truss fashion as illustrated in FIGS. **1** and **13** even through the deck is upraised from a flat supporting surface.

End wall **28** and end wall **30** are provided with interlocking male and female aligning extensions, **60** and **62** respectively, which additionally engage when the deck members are in their extended position. These members are employed for aligning rail portions **16**, **18'**, **16'**, **18** and for additional reinforcement.

Deck portion side walls, for example, side wall **32** of deck portion **10**, cooperate with pin **26** to form a part of hinge **24**. Sidewall **32** extends downwardly at the location of the hinge and somewhat beyond end wall **28** to provide a first hinge tap **34** which apertured to provide a bearing for pin **26**. Tab **34** increases in thickness at this point and is suitably rounded. An inner hinge tap **36** similarly extends from side wall **32** at a point farther from end wall **28** and is also apertured for journaling shaft **26**. Also, similar tabs **38** and **40** extend from side wall **42** of deck portion **12** and are apertured for journaling pin **26**. Tabs **38** and **40** are interleaved with tabs **34** and **36** as illustrated in FIG. **14** for maximum support strength. The deck portions **10** and **12** are substantial duplicates of one another in the hinge area, with each of these end portions having a construction exemplified by tabs **34** and **36** on one side thereof and a construction exemplified by tabs **38** and **40** on the other side thereof. Then, when the deck portions are placed in end to end relation, with the rail portions **16**, **18**, **16'**, **18'** thus reversed with respect to one another, it is seen that a hinged relation such as illustrated in FIG. **14** will always result. The hinges **24** here provide means for complementarily joining the deck portions together.

Each of the deck portions is provided with transverse slots **44** at the end thereof opposite the hinge. As will hereinafter become more evident, these slots are employed for engaging the complete deck at one end thereof for upraising the same. The deck portions are also provided with longitudinal sockets **46** at either side thereof at the end opposite the hinged end. A foot bar **48** as illustrated in FIG. **21** may be secured to the deck portion with the legs **52** and **54** of bar **48** inserted into sockets **46**. The same ends of the deck portions are also provided with a boss **56** at either side thereof having a hole **58** for receiving pulley eyebolts for purposes hereinafter described.

The deck in extended or unfolded position is supportable at one end thereof on the ground or floor, while the opposite end thereof is supportable upon a ladder **64** illustrated in FIGS. **1**, **5** and **6**. This support ladder is hinged at points **66** so the same may be collapsed for shipping or storage. The support ladder comprises a front ladder frame **68** and a rear ladder frame **70** which are angularly related with respect to each other and with respect to the vertical when unfolded and supported on the ground or floor in step ladder fashion as illustrated in FIG. **5**. The sides of frame **68** extend to a peak and are then turned downwardly to the location of hinges **66**. The ladder frames are formed of tubular members, with frame **70** fitting within frame **68** at the location of hinges **66**, whereby, when the ladder is unfolded, the tubular construction of frame **68** prevents frame **70** from unfolding further than illustrated in FIG. **5**. Ladder frame **68** includes horizontal rungs **72**, while frame **70** includes a single reinforcing rung **74** at the lower end thereof. Rungs **72** are spaced along frame **68** in ladder fashion and may be selectively employed for supporting one end of the unfolded deck as illustrated in FIG. **1**. Thus, the deck **10**, **12** is angularly supported with slots **44** engaging a selected rung **72** for procuring a desired degree of slant.

The exercise device according to the present invention also includes a demountable carriage **76** provided with nylon rollers **78** for engaging deck rail portions **16**, **18'**, and **16'** and **18** which are properly aligned with the deck in the unfolded position. The shafts of rollers **78** are supported in matching apertures in sides **80** of carriages **76** and downward extensions **82** which protrude downwardly from the top of the carriage. Carriage **76** is substantially flat in overall construction, but is contoured by means of reinforcing corrugations **84** for enhancing the rigidity thereof. The carriage includes edge rails **86** within which a cushion **88** is located, this cushion suitably being formed of upholstered material attached to a three-sixteenth inch masonite back which is accommodated within rails **86** upon the upper face of carriage **76**. For clarity of illustration, the cushion is not shown specifically mounted upon the carriage except in FIG. **18**. Rubber stops **85** (FIG. **20**) are provided at least at the lower carriage end for engaging bumpers **22**, the latter forming the lower limit for carriage movement.

Carriage **76** is provided at its upper end with a strap **90** to which lines **92** and **94** are attached. (See FIG. **3**) Each of these lines passes through a pulley **96** attached to an eye bolt **98** which is secured in a hole **50** of boss **56** in deck portion **12**. After passing through a pulley **96**, each of the lines extends back toward the carriage where handles **100** are connected at the line ends. These handles are grasped by a person **102** supported upon carriage **76** for operating the exercising device of the present invention. A tow strap **104**, provided with clips **106** at either end, is also suitably connected between eye bolts **98**.

The general use of the exercise device according to the present invention is exemplified by FIG. **1**. With the extended deck **10**, **12** placed in hooked relation with one of the rungs **64**, person **102** moves his own weight on carriage **76** up the rails of the exercise board. Thus, he may grasp handles **100** pulling them backward for moving the carriage **76** up the plane of the deck. Alternatively, exertion may be expended against foot bar **48** for moving the carriage **76** up the incline, for example, with one's feet placed against foot bar **48**. Sit-ups can be performed employing toe strap **104**, at which time, of course, the exerciser inserts his heet under such toe strap. Different exercises can be accomplished with the individual facing either ladder **64** or foot bar **48**, in a sitting, kneeling, or lying position on one's back or stomach. Innumerable exercises are made possible by the present device for developing the arms, abdominal regions, legs, etc.

The present invention is based upon the principles of dynamic tension, using the body weight as the substance of resistance against which the muscles are exerted. By hooking the deck on different rungs of the ladder, the force required to move the body weight can be adjusted. The rung setting on the ladder can be such that an exercise is not too strenuous, but is correct for the individual involved. The deck may be nearly level, and is useful in therapeutic rehabilitation of people suffering from accidents or sickness. The device may be adjusted so that even an incapacitated person can exercise to a limited degree.

Many exercises are accomplished with the present device while one is in a sitting or prone position. This has an advantage over many exercise regimes in that no energy is required to maintain balance. All the needed energy is concentrated on the exact muscles that one is trying to strengthen, develop, or contour. There is less exertion on the heart

muscles because, in the relaxed position, the heart has no additional burden in forcing the blood to upraised extremities.

An alternative construction for joining deck portions of the exercise device according to the present invention is illustrated in FIGS. **22** and **23**. Here, deck portions **10'** and **12'** are substantially flat except for rail portions **112** and **118**, respectively, at the sides thereof. Although only one side is illustrated In FIGS. **22** and **23**, it is understood that the remaining side is substantially identical. The rail portions comprise closed channels, suitably rectangular in cross section, providing a rectangular inner socket **110** in the case of rail portion **112**, and socket **116** in the case of rail portion **118**, for receiving a structural member **120**. Structural member **120** is suitably an aluminum bar of rectangular cross section closely received within sockets **110** and **116** for rigidly joining the deck portions **10'** and **12'** together in end-to-end relation. For collapsing the exercise device, the deck portions are pulled apart longitudinally. The structural members **120** may be either removed, or left in the sockets of one or the other of the deck portions. As in the previous embodiment, a carriage, here numbered **76'**, travels along rail portions **112** and **118** upon nylon rollers **78'**. This embodiment corresponds to the previous embodiment in respect to the use thereof for exercising purposes.

A yet lighter and simpler structure constituting a third embodiment of the invention is shown in FIGS. **24** through **27**. With initial reference to FIG. **24**, both deck portions **130, 132** take the form of open tubular frames formed of aluminum or other metallic tubing having relatively light weight characteristics. More particularly, the lower deck portion **130** is formed by a single piece of appropriately bent tubing of generally U-shaped configuration, the lowermost end being bent upwardly to form a transversely extending foot bar **134**. Adjacent the open end of the U, a tubular cross-brace **136** is welded between the tubular legs to add rigidity to the structure without the necessity of a central planar deck portion as in the other embodiments of the invention. Thus, weight is minimized.

The extremities of the tubular leg portions of the U-shaped lower deck portion **130** are bent downwardly and flattened and provided with an opening for reception of a hinge pin **138**, as best shown in FIG. **25**, which pin also passes trough an aligned opening in the downwardly bent and flattened end portion of the adjacent extremity of one of the two tubular legs forming the upper deck portion **132** of the apparatus. The legs of the deck portion **132** are joined by a cross-brace **140** closely adjacent the hinge and are joined by eye bolts **143** adjacent their upper remote extremities to the transversely bent portion **142** formed integrally with tubular side rails **144** to be described hereinafter. The extremities of the two legs of the upper deck portion are each flattened and bent downwardly to form a hook **146** arranged to provide support on one rung **147** of the support ladder **148** to be described hereinafter, and as best shown in FIG. **26**.

From the integral transversely bent portion **142**, the tubular side rails **144** extend over the top of the deck forming tubular legs and are welded thereto at intervals, each tubular side rail terminating above the described hinge pin **138**, as clearly shown in FIG. **25**. Similar tubular side rails **150** are welded along the top of the tubular legs of the lower deck portion **130** and accordingly are in substantially alignment with the side rails **144** when the deck portions **130, 132** are brought to their extended operative disposition illustrated in FIG. **24** and in full lines in FIG. **25**. To assure precise rail alignment, an alignment member in the from of a short cylindrical metal plug **152** is pressed into each side rail **150** and an integral shoulder **154** of the same exterior diameter as the tubular side rails **144, 150** is interposed between their extremities. In turn, a conical extension **156** of the plug is inserted into the open end of the adjacent side rail **144** thus to accomplish the alignment function but at the same time permit its withdrawal when the deck portions **130, 132** are pivoted about the hinge pin **138** to their parallel collapsed, folded disposition indicated in phantom lines in FIG. **25**.

Reverting to FIG. **24**, the side rails **144, 150** are engaged by concave rollers **158** under the four corners of a flat carriage **160** which corresponds otherwise to the carriages of the first and second embodiments of the invention. Lines **162** are connected to such carriage **160** and extend through the eye-bolts **143** and thence return for connection to handles **164** at their extremities. Operation is the same as the other embodiments of the invention so it will not be repeated.

The support ladder **148** includes a plurality of rungs **147** on one section **166** which join straight tubular frame members **168** pivotally joined at their upper extremities by a pivot pin **170** bridging the interior side walls of a cap **172** whose end walls are angularly disposed to restrict the pivotal outward movement of the frame members **168** through abutting contact indicated at **174** in fIG. **27**. The other section **176** of the ladder **148** includes upright frame members **178** which are similarly pivotally joined to the cap **172** by another pivot pin **170** and similarly restricted in the amount of its pivotal opening. The lower end of the frame members **178** is joined by an integral transverse section **182** to add rigidity while retaining the desired light weight characteristics of the structure. Furthermore, the described pivot arrangement permits the ladder **148** to be folded to a flattened collapsed form as indicated in phantom lines in FIG. **27**, thus to minimize requisite storage area.

In the case of either embodiment, the exercise device according to the present invention is readily collapsible for shipping, storage, or movement from place to place in the owner's home or gymnasium. The deck portions may be collapsed and suitably disposed in adjacent relation as illustrated in FIG. **2**. The pulley system is disengaged, and the carriage, which is suitably about the same length as one of the deck portions, is placed in juxtaposition therewith. The ladder is also of similar width and is completely collapsible whereby it may be placed adjacent the foregoing mentioned members to provide a flat package which is easily received within a flat container for shipping or storage purposes. In a particular constructed embodiment, each of the deck portions was approximately 44 inches in length, thus establishing the total length of the overall container at slightly more than 44 inches. When the deck portions are extended end-to-end for use, the overall length is suitably appreciably longer than the height of a human being, but is shown to be collapsible into a package of much shorter length for easy transport by a human being.

While I have shown and described embodiments of my invention, it will be apparent to those skilled in the art that many changes and modifications may be made without departing from my invention in its broader aspects.

What is claimed is:

1. An exercise device comprising,

a pair of deck portions together forming a substantially flat, reinforced deck comprising said portions in extended, aligned relation, said portions being collapsible relative to one another for shipping and storage in substantially adjacent relation, said deck portions having a construction providing rail portions at either side of said deck,

support ladder having a plurality of horizontal rungs positioned to selectively support one end of said reinforced deck at selected elevations,

a carriage provided with rollers for traveling along said rail portions, and

pulley means comprising pulleys attached to said deck at the end thereof adapted to engage the rungs of said ladder and lines extending through said pulleys from said carriage and back to said carriage for moving said carriage along said deck,

said deck portions being hingedly connected to one another about an axis offset below said rail portions as said deck portions are extended to provide said reinforced deck, with ends of said deck portions abutting one another above said axis when said deck portions are extended for holding said deck portions in aligned and rigid relation,

said deck portions being provided with end portions which abut one another above said axis, and wherein said axis is

offset below the longitudinal center line of said deck portions.

2. The device according to claim 1 further including,
interfitting aligned extensions disposed upon said end walls for aligning said rail portions with said end walls in abutting relation.

3. The device according to claim 1 wherein,
said deck portions provide a generally flat overall top surface with said deck portions disposed in end-aligned relation, said deck portions being thicker at their hinged ends and providing hinge forming means at such location spaced from the top surface of said deck and said thickened ends providing stiffening of said deck.

4. The device according to claim 1 provided with hinges comprising,
interleaved tabs extending from side walls of said deck portions, and an axle pin extending through said interleaved tabs at a location spaced at a distance below said rail portions.

5. The device according to claim 1 wherein,
said deck portions include aligned end sockets substantially within said rail portions, said device further including longitudinal structural members received in said end sockets for detachably joining said deck portions in extended aligned relation to form said deck.

6. The device according to claim 1 wherein,
said deck portions and said carriage are formed of molded plastic material.

7. The device according to claim 1 wherein,
said deck portions are formed of pressed metal.

8. The device according to claim 1 wherein,
at least one of said deck portions is provided with transverse end slots for engaging rungs of said support ladder.

9. The device according to claim 1 further including,
a foot bar for attachment to said deck at the end thereof opposite the end supported by said support ladder.

10. An exercise device according to claim 1 wherein,
said side rails are formed by tubular members.

11. An exercise device according to claim 10 which comprises,
an alignment member secured in the end of one of said side rails and having an extension projecting into the end of an aligned side rail when said deck portions are borough into end-to-end relation.

12. An exercise device according to claim 1 wherein,
said support ladder includes two frame sections pivotally joined to a cap dimensioned to restrict the amount of open angular relation of said frame sections.

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