



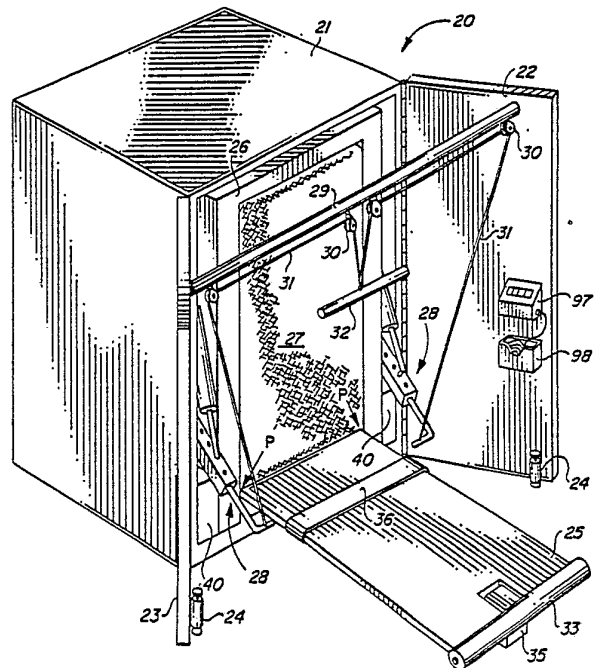
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(54) Title: MULTIPLE DEVICE EXERCISE SYSTEM

(57) Abstract

An exercise system utilizes a common linear structural element (38) which makes possible the incorporation of a multiplicity of exercise devices as part of the exercise system housed within a cabinet (21) or readily storable in a closet. The structural element (38) comprises an extrusion with a plurality of longitudinal channels (A through G) thereabout for accepting wheels (41), slide or locking plates (57) or similar devices for coupling various exercise devices to the structural element. The variety and multiplicity of such linear channels permits a dynamic relationship to exist among an infinite number of positioning points of coupling of the various exercise elements to the structural element. The problem that has existed is that home exercise equipments do not lend themselves to interrelating a large plurality of exercise devices. This problem has been overcome by the claimed invention which may be connected into a large number of exercise devices, and be stored in a cabinet.



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MULTIPLE DEVICE EXERCISE SYSTEM

DESCRIPTION

Technical Field

The invention relates to the field of exercise devices, particularly those suited for use within the home. The invention relates to a cabinet enclosed exercise system, the cabinet blending with the interior decor of the home, housing the exercise devices making up the system when the system is not in use, and acting to partially support the various exercise devices of the system while the system is in use.

Background Art

More and more people are concerned with physical fitness. Health clubs with exercise machines, aerobic exercises, swimming and the like abound. Such clubs are costly and often crowded. While the desire to remain fit is on the rise, modesty and the annoyance with crowded places causes many people to look for other, more effective ways to workout. As a result, the home-exercise industry has topped the billion dollar a year mark in the United States and shows no sign of slowing.

In-home exercise equipment ranges from things as simple as jump ropes and small hand-held weights to gravity-inversion systems and multi-function gym units which cost as much or more than \$3,000.00. The big question for the in-home exerciser is where, in the home environment, is the best place to exercise. The weather often prohibits the use of the equipment on porch or patio. The indoor environment can be better controlled, but the location of the equipment within the home then becomes important. Few people have a room that can be devoted exclusively to exercise. Most residential bedrooms are too small to house both a suite of furniture and exercise equipment as well. Such devices usually find their way into the family room or living room of

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2 the home where they clash with the decor and impose themselves
3 upon the family's living space..

4 The potential of the home exercise system to present
5 itself as an eyesore is well recognized. The prior art
6 abounds with cabinets for housing exercising equipment.
7 Most such cabinets are intended to hide such clutter of
8 bar bells, dumb bells, and cord and pulley exercise devices.
9 The variety of exercisers available for use with such a
10 cabinet housed exercise system has generally been limited.
11 Attempts to house a great variety of exercise devices within
12 an attractive cabinet have met with very limited success
13 because of the complexity of assembling a plurality of
14 exercise devices in a manner which permits the dynamic
15 interaction of these devices while maintaining the overall
16 cost of such exercise system at a reasonable level. Prior
17 art cabinet housed exercise systems, in general, do not
18 lend themselves to dynamically interrelating a great
19 plurality of exercise devices primarily because of the
20 limitations of the structural elements of which the prior
21 art systems are made. Simple cylindrical or rectangular
22 tubular structural elements are limited in their ability
23 to support several moving elements such that the relative
24 positions of the elements may be readily changed one with
25 respect to the other without interference of one with
26 another.

27 It is an objective of the present invention to pro-
28 vide a cabinet housed exercise system which will complement
29 the decor of the home and impose itself minimally upon the
30 living space of the home when the exercise system is not in
31 use.

32 It a further objective of the invention to provide
33 a cabinet housed exercise system which houses a multiplicity
34 of exercise devices without the structural constraints
35 imposed upon prior art systems.

36 It is another objective of the invention to provide
37 a cabinet housing a plurality of exercise devices in dynamic

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2 interrelationship by use as a coupling device which permits
3 the non-interfering longitudinal displacement of the points
4 which a plurality of such exercise devices are coupled to
5 the structural element.

6
7 Disclosure of the Invention

8 The invention is an improvement in exercise systems
9 which house a plurality of exercise devices within a cabinet
10 which houses and supports the various devices. The improve-
11 ment is a common lineal structural element which has a
12 plurality of longitudinally disposed channels each communi-
13 cating with the exterior element so as to allow each
14 channel to accept one or more wheels or slide plates or
15 locking plates. By placement of such elements within the
16 various channels, the common structural element is employed
17 as a coupling device which permits the cooperative assembly
18 of a plurality of exercise equipment and which permits that
19 equipment to be efficiently housed within the cabinet.
20 Importantly, the plurality of longitudinally disposed channels
21 permits the non-interfering longitudinal displacement of
22 the points at which several of the exercise devices are
23 coupled to any one given structural element.

24 When a framework is made up of two or more lengths
25 of the common structural element, the plurality of channels
26 permits devices to be slidably or fixedly coupled across
27 the interior of the frame, or astraddle the frame when
28 coupling is made to the exterior channels at the opposing
29 outer walls of the frame. Channels in the top and bottom
30 surfaces of the frame as well as in the inside and nominal
31 outside walls of the frame may all be used to achieve fixed
32 or slide coupling of exercise elements to the frame.

33 As disclosed herein, such a frame may be used to
34 couple a treadmill exercise device thereto as well as a
35 weight bench, hydraulic system to simulate weight exercises,
36 and pulley and cord exercise devices. A second frame may
37 be employed in the assembling of a collapsible bicycle frame.

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2 The first frame may be used in conjunction with the bicycle
3 frame permitting the bicycle exerciser to drive idler wheels
4 supported by the first frame or to drive or be driven by the
5 treadmill coupled to the first frame.

6

7 If the first frame is provided with a central
8 longitudinal beam so as to provide two rectangular and
9 parallel voids therein the first frame may be provided with
10 ski pads which are slidingly coupled one each within one of
11 the parallel voids. Thus, a ski-type exercise may be
12 performed in association with the ski pads and the hydraulic
13 resistance units.

14

15 The common structural element disclosed herein is an
16 extrusion having, for example, seven channels about its
17 periphery which channels may be employed for coupling wheels,
18 slide plate and locking plates thereto.

19

20 Brief Description of Drawings

21

22 Fig. 1. is a perspective view of an exercise cabinet
23 with doors ajar, weight bench, chinning bar and lateral bar
24 disposed for use, with treadmill and coupling frame in
25 storage position.

26

27 Fig. 2 is a perspective view illustrating coupling
28 of exercise cord pulleys to coupling frame and hydraulic
29 weight simulators and leg lift exercise extension of weight
30 bench.

31

32 Fig. 3 illustrates in perspective detail, the
33 extrusion element which facilitates housing a multiplicity
34 of exercise devices within a single cabinet.

35

36 Fig. 4 is an end elevation view of the coupling
37 frame indicating the positions of the treadmill and weight
38 bench therein.

39

40 Fig. 5 is a perspective view of the coupling frame
41 withdrawn from the cabinet and with treadmill positioned
42 for use with hydraulic weight/resistance simulators.

43

44 Fig. 6 is a perspective illustration of an alternate
45 embodiment of the coupling frame with a central beam to

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2 accomodate coupling of ski pads to the coupling frame. The
3 use of the frame as a rowing exerciser with either embodi-
4 ment, is also illustrated.

5 Fig. 7 is a side elevation of the coupling frame
6 showing details of the hydraulic weight simulators and
7 manner in which frame and simulator may be stowed in
8 cabinet or positioned for use with weight lifting exercises
9 and weight bench.

10 Fig. 8 is an end elevation of the coupling frame and
11 weight simulators showing pivoting of simulator handles to
12 accomodate skiing, rowing or cord associated exercises.

13 Fig. 9 is a cross sectional view of a segment of the
14 coupling frame detailing the manner in which the treadmill
15 idler roller is coupled to the frame.

16 Fig. 10 is a perspective view of the coupling of the
17 rowing exerciser foot pad to the coupling frame.

18 Fig. 11 details the coupling of the seat of the
19 rowing exerciser to the coupling frame.

20 Fig. 12 is a detail of the manner in which the
21 hydraulic weight/resistance simulators are coupled to the
22 coupling frame.

23 Fig. 13 details the adjustable coupling of pulleys
24 to the coupling frame for use in cord associated exercisers.

25 Fig. 14 is a detail of the coupling of the ski pads
26 to the coupling frame.

27 Fig. 15 is a perspective of the ski pad.

28 Fig. 16 is a side elevation of the bicycle exerciser
29 storable with the cabinet.

30 Fig. 17 is a plan view of the bicycle in its folded,
31 storable configuration.

32 Fig. 18 is a side sectional elevation of the
33 exercise cabinet with exercise devices stoeed therein.

34
35 Best Mode for Carrying Out The Invention

36 For the purposes of promoting an understanding of
37 the principles of the invention, reference will now be made

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2 to the embodiments illustrated in the drawings and specific
3 language will be used to describe the same. It will, neverthe-
4 less, be understood that no limitation of the scope of the
5 invention is thereby intended, such alterations and further
6 modifications in the illustrated device, and such further
7 applications of the principles of the invention as illustra-
8 ted therein being contemplated as would normally occur to
9 one skilled in the art to which the invention relates.

10 The drawings of the invention illustrated here are
11 not scale drawings. In certain of the perspective views,
12 the cabinetry and framework is presented as broader or
13 having greater depth than in actual fact. This is brought
14 about by the desire to clearly present details to enable
15 those skilled in the art to readily understand the disclosure
16 of the invention. Thus the drawings are prepared for concep-
17 tual communication rather than pictorial exactness. The
18 invention 20 is presented in perspective view in Figure 1.
19 A cabinet 21 houses a plurality of exercise devices. Cabinet
20 doors 22 and 23 open outward to provide access to the various
21 exercise devices and also act as support members to stabilize
22 the cabinet when a person is employing certain of the exer-
23 cise devices when they are extended outward from the cabinet.
24 To this end floor contacting support units 24 are provided
25 one at each of doors 22 and 23.

26 In Figure 1 is seen a weight bench 25 which is
27 pivotally coupled to a frame 26 at points P, the undersurface
28 of treadmill 27 appears in Figure 1 housed within framework
29 26.

30 A chinning bar 29 maintains doors 22 and 23 in their
31 open position at about a 45 degree angle with respect to the
32 plane of the face of the cabinet 21. The bar 27 may be
33 employed for chinning exercises and also supports pulleys
34 30 which communicate a resistance from hydraulic weight
35 simulators 28 through cords 31 to exercise devices such as
36 a lateral bar 32.

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2 Weight bench 25 has a leg lift extension 33 which may
3 be extended as seen in Figure 2. Not shown but readily
4 conceived by those skilled in the prior art is a mechanism
5 which will limit the upward travel of leg lift extension
6 33 to the approximate conjunction of the plane of weight
7 bench 25. In withdrawing the leg lift extension from its
8 storage position, shown in Figure 1, the decision is made
9 to emplace the extension 33 above or below the plane of
10 weight bench 25. If emplaced above, the mechanism in ques-
11 tion will limit the downward travel of extension 33 so that it
12 cannot pass through the plane of weight bench 25.

13 Leg lift extension 33 may be coupled directly to
14 hydraulic lever weight simulators 28 or, as shown in Figure
15 2, cords 34 may be employed to communicate the resistance
16 provided by hydraulic lever units 28 to the leg lift
17 extension 33.

18 As will be disclosed in greater detail herein,
19 hydraulic lever assemblies 28 are lockingly slide coupled
20 to frame 26 so their longitudinal position on frame 26
21 may be selectively determined. Thus a person lying on
22 weight bench 25 may readily make use of the hydraulic lever
23 assemblies to perform weight pushes and weight pulls. Hand
24 rings 39 which communicate with hydraulic resistance lever
25 units 28 by means of cords 37 and pulleys 74 may be used
26 alone or in conjunction with weight bench 25. As will be
27 disclosed further in the discussion of Figure 7, hydraulic
28 resistance lever assemblies 28 are adjustable to provide a
29 range of resistance to suit the needs of the individual
30 utilizing the exercise system.

31 Weight bench 25 is provided with support leg 35.
32 Support leg 35 is foldable to permit convenient storage of
33 the weight bench 25 within frame 26 in cabinet 21. When
34 the weight bench 25 is extended in positions shown in Figures
35 1 and 2, and support leg is extended, weight bench 25 is
36 generally parallel to the floor in which cabinet 21 sits.
37 If support leg 35 is placed in its fold-down position, weight

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2 bench 25 may be utilized as a slant board, in which case
3 foot strap 36 is available to hold the legs and feet of
4 the person performing exercises on the slant board.

5 A common lineal structural element is utilized to
6 permit the incorporation of a multiplicity of exercisers
7 within cabinet 21. This common structural element is an
8 extrusion 38, a section of which is shown in perspective in
9 Figure 3. Extrusion 38 is provided with a plurality of
10 longitudinal disposed channels A through G which communicate
11 with the exterior of extrusion 38. Within the channels may
12 be incorporated wheels, slide plates, and locking plates
13 so that a multiplicity of exercise devices may be coupled to
14 structural element 38. Because of the configuration of
15 extrusion 38 and the variety of channels therein, the points
16 at which various exercise devices are coupled to element 38
17 may be selectively determined and adjusted each with respect
18 to the others along a line parallel to the longitudinal
19 axis of element 38. Thus each coupling point may be selec-
20 tively disposed without interfering with other coupling
21 points along the length of element 38. Frame 26 is comprised
22 of four lengths of structural element 38 to provide a
23 rectangular framework. As shown in Figure 2 and in somewhat
24 greater detail in Figure 4, the treadmill 27 is coupled
25 between interior opposing walls of frame 26. Idler rollers
26 41 are coupled to channels A of elements 38 in frame 26
27 as a rolling support for treadmill 27. Weight bench 25 is
28 pivotally coupled within frame 26 in channels E of structural
29 elements 38. When frame 26 is raised to the position shown
30 in Figures 1 and 2, weight bench 25 may be pivoted upward
31 for storage within frame 26.

32 Weight bench 25 is lockable, by conventional means,
33 within its stored position within frame 26. This permits
34 the lowering of frame 26 to the position as shown in Figure
35 5. When frame 26 is so lowered, treadmill 27 is available
36 for use. An idler roller 41 at each end of treadmill 27,
37 only one of which is shown here, provides rolling support for

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1
2 treadmill belt 42. Between the two idler rollers 41 is a
3 support surface 99 with a low-friction coating thereon.
4 Such coating may comprise teflon or polypropylene. A driven
5 roller 43 in frictional contact with belt 42 provides the
6 necessary drive to treadmill belt 42. Drive motor 44 is
7 coupled by belt drive 45 to drive roller 43 as a primary mover
8 for treadmill 27. A variable speed control, housed in
9 electronic monitor in control box 97 on the door of cabinet
10 21, Figure 1, provides infinite variation in the speed of
11 drive motor 44 so that belt 42 may be driven at speeds
12 infinitely variable up to 10 m.p.h. Hydraulic lever resis-
13 tance assemblies 28 may be utilized by a person on the belt
14 for support as well as exercise purposes.

15 In Figure 6 is shown the provision of a rowing
16 exercise device coupled to frame 26. The rower's seat 49
17 is slide coupled to a frame 26 and the person performing the
18 rowing exercise sits on seat 49 and utilizes each of the
19 hydraulic lever assemblies 28 as an oar. Footpads 50 are
20 adjustably slide coupled to the top of frame 26 to provide
21 a foot rest for the rower. Frame 26 is to be used for other
22 purposes. Rowing seat 49 is positioned at the left most
23 extreme of frame 26 as depicted in Figure 6. It should be
24 noted here that the details of the rowing machine exerciser
25 shown in Figure 6 might well have been illustrated in the
26 drawing of Figure 5. It was omitted there to enable dis-
27 closure of the details of treadmill 27. Frame 26 is seen
28 in Figures 1, 2 and 5 as being slide coupled to two short
29 lengths 40 of extrusion 38. This coupling between frame 26
30 and lengths 40 of extrusion 38 permits the pivotal coupling
31 of frame 26 to cabinet 21 and also permits adjustment of the
32 height of frame 26 which may be manipulated to permit the
33 exercises to take place on an inclined plane. Cover 26 in
34 Figure 5 is emplaced over the motor 44 and drive 45 and
35 roller 43 when treadmill 27 is in use.

36 If a purchaser of the invention decides to forego
37 the expense of treadmill 27, a modification of frame 26 will

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1
2 provide a skiing type exercise. As seen in Figure 6, a
3 central beam 47 is emplaced along the longitudinal axis
4 of frame 26. Within the two voids within frame 26
5 which thus results, placed, one in each, is a ski pad which
6 is slide coupled to central beam 47 in the interior walls of
7 frame 26. When an exerciser places one foot on each of
8 ski pads 48, he may utilize hydraulic lever assemblies 28
9 as ski poles thereby exercising arm, leg and back muscles.
10 Frame 26 of Figure 6 is coupled to lengths 40 of element 38
11 as depicted in Figure 5 and thus, frame 26 may have its
12 left-most end, as depicted in Figure 6, raised or lowered
13 to provide an incline or a level ski slope for the exerciser
14 to practice on. Depending on which side of the hydraulic
15 lever assemblies 28 the exerciser positions himself, the
16 exerciser has a choice of uphill or downhill ski exercises.

17 It has been found as a practical matter, that ski
18 pads 48 may be employed in lieu of rower seat 49 when the
19 exerciser wishes to perform rowing exercises.

20 One of the hydraulic lever assemblies 28 is shown
21 in greater detail in Figure 7. It comprises a slide plate 51
22 which is coupled to channel D of element 38 of frame 26.
23 The details of this coupling arrangement are illustrated in
24 Figure 12. Locking screw 52 provides frictional engagement
25 between plate 51 and the walls of channel D permitting plate
26 51 to be slide adjusted along the length of frame 26 and
27 locked into position where desired. A riser 53 is pivotally
28 coupled to plate 51 at 60. Riser 53 supports a height
29 adjustable handle 54 which may be locked into position by
30 means of locking adjustment 55. The hydraulic cylinder 56
31 is pivotally coupled to plate 51 at 61. Cylinder shaft 57
32 is removably coupled to riser 53 at 58. A series of coupling
33 points 59 is provided along riser 53 to which cylinder
34 shaft 57 may be coupled. This provides a selectable varia-
35 tion in the resistance experienced by an exerciser utilizing
36 hydraulic lever assembly 28.

37 To place frame 26 in its storage position, rowing

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2 is seen to comprise a coupling plate 69 which has a Tee-
3 shaped base 70 for coupling to channel F of extrusion 38.
4 A foot pressure plate 71 is provided to resist the pressure
5 of the rower's foot. A lever lock 72, not shown, but
6 similar in concept to the locking device illustrated in
7 Figure 13, permits the emplacement of the foot pad in the
8 desired position along the length of frame 26.

9 As illustrated in Figure 6, rowing seat 47 is
10 slidably coupled to frame 26 while straddling frame 26.
11 This is achieved as shown in Figure 11, illustrating a
12 section of extrusion 38 and a section of rowing seat 49.
13 The roller bearing wheel couples seat 49 to channel B of
14 extrusion 38. Two such wheels are emplaced on either
15 side of rowing seat A for coupling to either exterior side
16 of frame 26. Bearing wheels 73 provide a slide coupling of
17 rowing seat 49 to frame 26 as is required for optimum use
18 of the device as a rowing exerciser.

19 Figure 12 which details the coupling of lever
20 assembly 28 to extrusion 38 of frame 26 has been mentioned
21 earlier in the discussion of Figure 7. The detail of
22 Figure 12 illustrates the manner in which locking screw 52
23 provides a frictional lock for lockingly positioning slide
24 plate 51 along the length of the frame 26.

25 Figure 13 should be viewed with reference to Figure
26 2 which shows the hand rings 39 being coupled to hydraulic
27 lever assemblies 28 by means of cords 37 via pulleys 74.
28 Position of pulley 74 may be located anywhere along the
29 length of frame 26 by means of the lock lever coupling
30 illustrated in Figure 13. Here a pressure plate 75, having
31 a threaded tang attached, is coupled to channel G of extrusion
32 38 of frame 26. When lock lever 78, thread coupled to
33 threaded tang 76, is rotated, pressure is exerted on washer
34 77; and pressure plate 75 is drawn into frictional contact
35 with the walls of channel G. Thus, pulley 74 may be located
36 as desired anywhere along the length of channel G.

37 The ski pad 48 of Figure 6 is shown in greater detail

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2 in Figure 15. Two angle supports 79 are coupled to a
3 cushioned base 81. A pair of roller wheels 80 are affixed
4 to either of angle supports 79 for coupling to frame 26 or
5 central beam 47 as detailed in Figure 14. Ski pad 48 may
6 traverse the entire length of channel A in which bearing
7 wheel 80 is emplaced. A person may place his feet on each
8 of the cushioned surfaces of each of the ski pads 48 and
9 utilize them for skiing exercises. Or alternately, a person
10 may sit astride both of ski pads 48, Figure 6, and utilize
11 the pair of ski pads as a rowing seat in lieu of using rowing
12 seat 49, illustrated in Figure 6.

13 By utilizing a second frame made up of extrusions 38,
14 a bicycle exercise device may be provided which may be used
15 in conjunction with frame 46. The exercise bike 82 is
16 illustrated in Figure 16. Bike 82 comprises a frame 83
17 fabricated of extrusion elements 38. Bike 82 is assembled
18 in a manner which permits its folding into a small package
19 for storage within cabinet 21. The folded device is shown
20 in Figure 17. A crank and peddle assembly 84 is coupled
21 across the frame. Truss support 86, pivotally coupled at 91
22 to stanchion 85, is slide coupled by means of rollers 90
23 to frame 83. Rollers 90 are emplaced within channels on
24 opposing walls of frame 83 in the manner reminiscent of
25 that shown in Figures 11 to 14 for the rowing seats and
26 ski pads. Locking device 87 inhibits the movement of
27 rollers 90 when the bicycle is in its upraised position as
28 illustrated in Figure 16. When latch 87 is released, supports
29 86 are permitted to slide forward on bearings 90 which causes
30 stanchion 85 to rotate about a crank 84 so as to lie close
31 to frame 83. When so rotated, the bike may be stored
32 readily within cabinet 21. One end of frame 83 is pivotally
33 coupled at 88 to a section 89 of extrusion 38. The length
34 of element 89 need not be as long as indicated and, where
35 economy dictates, a more conventional means of coupling
36 frame 83 to the cabinet may be provided. Crank 84 drives
37 a sprocket 92 which, via drive belt 93, drives wheel 94 of

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bicycle 82. A pair of idler rollers set atop frame 26 provide for the ready rotation of wheel 94. A friction brake 96 may be adjusted to control the amount of effort required to drive bicycle wheel 94.

In the embodiment of the invention wherein treadmill 27 is emplaced within frame 26, bicycle wheel 94 may be placed directly in contact with treadmill belt 42 so that the person utilizing bike 82 will drive belt 42, contact drive roller 43, belt drive 45 and motor 44 as a load. Alternatively, an invalid or a person first beginning to exercise on bicycle 82, may activate motor 44 of treadmill 27 and permit the treadmill to drive wheel 94 of bike 82 and thus cause the crank 84 to be driven, moving the person's legs in response thereto.

Bicycle 82 utilizes hydraulic lever assemblies 28 as a handle bar assembly for use by the person riding bike 82. Actuation of the hydraulic lever assemblies 28 provides added exercise benefits to the rider of bike 82.

Figure 18 is a side view of cabinet 21 with the equipment stored within and the cabinet doors 22 and 23 closed. Bicycle frame 82 is rotated upwards and locked in position within cabinet 21. Thereafter, frame 26 is rotated upwardly and locked in position within cabinet 21. The doors are then closed and the cabinet provides an appearance to complement the decor of the room in which the exercise system has been utilized.

Electronic monitoring is provided by monitor and control 97 which provides a read out of pulse, elapsed time, mileage and speed. An infinitely variable speed control for treadmill drive motor 44 is also provided in monitor and control 97. A storage container 98 provides convenient storage of the pulse monitoring cables.

To this point, the invention has been disclosed in an embodiment intended for housing in a special cabinet provided with the exercise system. However, an embodiment of the invention, made possible by use of the common linear

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2 structural element, provides a plurality of exercise devices
3 in a configuration which may be readily stored in an existing
4 cabinet or a convenient closet within the home. This free
5 standing embodiment of the invention is shown in Figures 19
6 through 21.

7 In Figure 6 is shown a rectangular frame 26 with
8 a central beam 47 similar to the frame shown in Figure 19.
9 Hydraulic resistance units are adjustably coupled to frame
10 26 in the manner earlier disclosed and as illustrated in the
11 details of Figure 12. Slide pads 48 are coupled to the
12 interior walls of frame 26 in the manner earlier disclosed
13 with respect to Figure 14. With handles 54 disposed in the
14 vertical position, as indicated in Figure 19, the device
15 functions as a skiing exerciser when the person utilizing
16 the invention places his feet on pads 48 and grasps handles
17 54 in the manner in which ski poles are grasped. A leg
18 arrangement 35 is provided so that uphill, skiing exercises
19 may be simulated. Leg 38 here comprises support elements
20 101, 102 and 103 pivotally coupled by pivot pin 104 and
21 rotatably and slide coupled to frame 26 to provide the user
22 a choice of level or uphill skiing exercise. A similar leg
23 arrangement, not indicated in Figure 19, is provided to the
24 left of the illustration of Figure 19 to provide the user
25 with the choice of uphill or downhill skiing exercise.

26 By releasing lock screws 52, handles 54 may be
27 rotated to a horizontal position, openings 105 being provided
28 in the base of handle 54 to accommodate the alternate vertical
29 and horizontal positioning of handle 54 on hydraulic resis-
30 tance levers 28.

31 In the illustration of Figure 20, handles 54 have
32 been rotated to the horizontal position to serve as the
33 means for grasping hydraulic resistance lever 28 when the
34 invention is used as a rowing exerciser. When so employed,
35 pads 48 are placed adjacent to one another and the person
36 performing the exercises sits on both pads 48. A bar 33,
37 which will be seen to also function as an aid in performing

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2 leg lift exercises, is emplaced within supports 106, which
3 supports are slide coupled to frame 26 in a manner reminis-
4 cent of the arrangement illustrated in Figure 13. Locking
5 screws 107 are provided to lock supports 106 in position.
6 Supports 106 may be positioned along the length of frame
7 26 as may be desired by the person utilizing the invention.
8 When utilized as a rowing machine, as illustrated in Figure
9 20, bar 33 provides a foot rest as a counter-resistance
10 element for use by the person manipulating hydraulic
11 resistance levers 28 in a manner similar to that of rowing
12 a boat.

13 Both of legs 35 are illustrated in Figure 20.

14 In Figure 21, the arms of hydraulic resistance units
15 28 have been rotated downward to lie in a plane essentially
16 parallel to the longitudinal axis of frame 26. Bar 33 has
17 been removed from supports 106 and captivated by handles
18 54 of hydraulic resistance levers 28.

19 The manner in which handles 54 are inserted within
20 bar 33 is illustrated in the exploded view of Figure 22.
21 Handles 54 are removed from adjustable height lever arms 53
22 and the handles inserted into bar 33. Handles 54 are again
23 placed on arms 53 and locked in place by locking screws 52.
24 The invention is now configured for use as a leg lift bench.
25 Pads 48 are placed adjacent each other and positioned under
26 the buttocks of the person performing the leg lift exercise
27 or under the small of his back as may be desired. The person
28 performing the exercises may hook his feet below bar 33 to
29 utilize the device for leg lifting exercises. With arms of
30 hydraulic resistance units 28 raised, the person may place his
31 feet on bar 33 to perform leg pushing exercises. Legs 35
32 may be individually adjusted so that frame 26 may be utilized
33 as an inclined board. It will be readily understood that the
34 use of frame 26 as an inclined board exerciser may also be
35 achieved by removal of bar 33 and the actuation of hydraulic
36 resistance units 28 by hand grasping handles 54 to provide
37 an exercise for the upper portions of the body.

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2 For purposes of definition, "hydraulic resistance
3 means" as used herein, is intended to encompass fluid, air,
4 or spring loaded means adjustable for providing a selectedly
5 variable degree of resistance to the person utilizing said
6 means for exercise purposes.

7 What has been disclosed is a multiple device exercise
8 system. A common linear structural element makes possible
9 the incorporation of a multiplicity of exercise devices as
10 part of the exercise system housed within a cabinet or readily
11 storable in a closet. The structural element comprises an
12 extrusion with a plurality of longitudinal channels thereabout
13 for accepting wheels, slide or locking plates or similar
14 devices for coupling various exercise devices to the struc-
15 tural element. The variety and multiplicity of such linear
16 channels permits a dynamic relationship to exist among an
17 infinite number of positioning points of coupling of the
18 various exercise elements to the structural element. The
19 diversity of coupling arrangements permitted by use of this
20 common structural element provides an improvement in a home
21 exercise system in that a greater number and variety of
22 exercise devices may be provided for use within the home in a
23 manner which does not impose itself disadvantageously upon the
24 living space of the home and which does not detract from the
25 decor of the home.

26 Those skilled in the art will conceive of other
27 embodiments of the invention which may be drawn from the
28 disclosure herein. To the extent that such other embodiments
29 are so drawn, it is intended that they shall fall within the
30 ambit of protection provided by the claims herein.

31 Having described my invention in the foregoing
32 description and drawings in such a clear and concise manner
33 that those skilled in the art may readily understand and
34 practice the invention, that which I claim is:

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2 CLAIMS

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4 1. In an exercise system comprising a plurality of
5 exercise equipment, the improvement making it possible to
6 readily store and utilize such a multiplicity of equipment
7 comprising:

8 a common linear structural element having
9 a plurality of longitudinally disposed channels
10 communicating with the exterior of said element
11 for accepting at least one of wheels, slide
12 plates and locking plates within selected ones
13 of said channels, said common structural element
14 being employed as a coupling device for the
15 cooperative assembly of said plurality of
16 exercise equipment and the storing of same,
17 said plurality of longitudinally disposed
18 channels permitting the infinitally variable
19 noninterfering longitudinal selective
20 displacement of the points at which a plurality
21 of said exercise devices are coupled to a
22 given element.

23 2. The improvement of Claim 1 further comprising:

24 a rectangular frame comprised of at least
25 two lengths of said common structural element to
26 provide a plurality of said longitudinal
27 channels in opposing interior walls of said
28 frame for coupling exercise devices across
29 opposed interior walls of said frame.

30 3. The improvement of Claim 2 further comprising:

31 cabinet means for housing said rectangular
32 frame; and

33 coupling means for pivotally coupling said
34 rectangular frame to said cabinet to provide in
35 cooperation with said cabinet, partial support for
36 said rectangular frame and for rotating said
37 frame for storage within said cabinet.

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2 4. The improvement of Claim 3 wherein said rec-
3 tangular frame has a bicycle exercise device coupled thereto
4 said bicycle exerciser device comprising:

5 a crank and sprocket drive coupled across
6 opposing inner walls of said frame;

7 a seat support stanchion pivotally coupled
8 to the crank of said drive;

9 a truss support pivotally coupled to
10 said stanchion and slide coupled to opposing
11 interior walls of said frame; and

12 a belt driven wheel, belt coupled to the
13 sprocket of said drive and coupled to opposing
14 interior walls of said frame,

15 said pivotal and slide couplings of the members permitting
16 the bicycle exercise device to be folded down to a relatively
17 flat package coupled to and storable within said cabinet.

18 5. The improvement of Claim 3 further comprising
19 hydraulic resistance means coupled to said frame to be
20 used in association with exercise devices coupled across
21 opposed interior walls of said frame.

22 6. The improvement of Claim 5 further comprising:
23 pulley means lockingly, slidingly coupled to said frame;
24 and cord means coupled through a said pulley means to said
25 hydraulic resistance means for communicating a resistive
26 force from said hydraulic resistance means along said cord
27 means and through said pulley means, said cord means
28 thereby providing an exercise device.

29 7. The improvement of Claim 3, said frame being
30 pivotally coupled to said cabinet for storage therein and
31 further comprising a weight bench pivotally coupled at one
32 end within said frame and across opposing walls thereof for
33 use as an exercise device when said frame is stored within
34 said cabinet.

35 8. The improvement of Claim 7 further comprising
36 hydraulic resistance means coupled to said frame for use in
37 association with exercises performed on said weight bench.

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2 9. The improvement of Claim 8 further comprising:
3 pulley means lockingly, slidingly coupled to said frame;
4 and cord means coupled through said pulley means to said
5 hydraulic resistance means for communicating a resistive
6 force from said hydraulic resistance means along said cord
7 means and through said pulley means, said cord means thereby
8 providing an exercise device.

9 10. The improvement of Claim 3 wherein said rectangu-
10 lar frame comprises a first such frame having a bicycle
11 exercise device coupled thereto and a second such frame
12 cooperating therewith and having a treadmill exerciser
13 device coupled thereto, said bicycle exerciser device
14 comprising:

15 a crank and sprocket drive coupled
16 across opposing inner walls of said first
17 frame;

18 a seat support stanchion pivotally
19 coupled to the crank of said drive;

20 a truss support pivotally coupled to
21 said stanchion and slide coupled to
22 opposing interior walls of said first frame,
23 said pivotal and slide couplings of the members permitting
24 the bicycle exercise device to be folded down to a relatively
25 flat package coupled to and storable within said cabinet;
26 said treadmill exerciser device comprising:

27 a pair of idler rollers disposed
28 in spaced apart relationship each
29 coupled across opposing inner walls
30 of said second frame;

31 a low-friction surfaced support
32 coupled across opposing inner walls
33 of said second frame between said
34 pair of idler rollers; and

35 a treadmill belt emplaced about said pair
36 of idler rollers and supported in part by said
37 low-friction surfaced support, said belt driven

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2 wheel of said bicycle exerciser being dis-
3 posable for contact with the surface of said
4 treadmill belt when said bicycle exerciser
5 is in use, said second frame being pivotally
6 coupled to said cabinet for storage therein.

7 11. The improvement of Claim 42 further comprising
8 a weight bench emplaced below said treadmill exerciser
9 device and pivotally coupled at one end of said second frame
10 and across opposing walls thereof for use as an exercise
11 device when said second frame is stored within said cabinet.

12 12. The improvement of Claim 11 further comprising:
13 hydraulic resistance means coupled to said second frame for
14 use in association with exercises performed on said weight
15 bench.

16 13. The improvement of Claim 12 further comprising:
17 pulley means, lockingly, slidably coupled to said frame;
18 and cord means coupled through said pulley means to said
19 hydraulic resistance means for communicating a resistive
20 force from said hydraulic resistance means along said cord
21 means and through said pulley means, said cord means thereby
22 providing an exercise device.

23 14. The improvement of Claim 3 wherein said
24 rectangular frame has coupled thereto a treadmill exerciser
25 device said treadmill exerciser device comprising:

26 a pair of idler rollers disposed in spaced
27 apart relationship each coupled across
28 opposing inner walls of said frame;

29 a low-friction surfaced support coupled
30 across opposing inner walls of said frame
31 between said pair of idler rollers; and

32 a treadmill belt emplaced about said
33 pair of idler rollers and supported in part
34 by said low-friction surfaced support,
35 said frame being pivotally coupled to said cabinet for
36 storage therein.

37 15. The improvement of Claim 43 further comprising

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a weight bench emplaced below said treadmill exerciser device, pivotally coupled at one end of said frame and across opposing walls thereof for use as an exercise device when said frame is stored within said cabinet.

16. The improvement of Claim 15 further comprising hydraulic resistance means coupled to said frame for use in association with exercises performed on said weight bench.

17. The improvement of Claim 16 further comprising: pulley means lockingly, slidingly coupled to said frame; and cord means coupled through said pulley means to said hydraulic resistance means for communicating a resistive force from said hydraulic resistance means along said cord means and through said pulley means, said cord means thereby providing an exercise device.

18. The improvement of Claim 17 comprising a second said rectangular frame having a bicycle exercise device coupled thereto said bicycle exerciser device comprising:

a crank and sprocket drive coupled across opposing inner walls of said second frame;

a seat support stanchion pivotally coupled to the crank of said drive;

a truss support pivotally coupled to said stanchion and slide coupled to opposing interior walls of said second frame; and

a belt driven wheel, belt coupled to the sprocket of said drive and coupled to opposing interior walls of said second frame,

said pivotal and slide couplings of the members permitting the bicycle exercise device to be folded down to a relatively flat package coupled to and storable within said cabinet.

19. The improvement of Claim 3 further comprising an additional length of said common structural emplaced within said rectangular frame along the longitudinal axis thereof to provide two pair of opposed longitudinal interior walls each wall with a plurality of said longitudinal channels to

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2 which exercise devices may be coupled from one opposing
3 interior wall to another.

4 20. The improvement of Claim 19 further comprising
5 first ski pad means slidingly coupled across a first pair
6 of said opposing interior walls; and second ski pad means
7 slidingly coupled across a second pair of said opposing
8 interior walls for providing a skiing-like exercise device.

9 21. The improvement of Claim 20 further comprising
10 hydraulic resistance means coupled to said frame to be used
11 in association with exercise devices coupled to said frame.

12 22. The improvement of Claim 21 further comprising
13 a weight bench emplaced within said frame and below said
14 additional length of said common structural element, pivotally
15 coupled at one end of said frame for use as an exercise
16 device when said frame is stored within said cabinet.

17 23. The improvement of Claim 22 further comprising:
18 pulley means lockingly, slidingly coupled to said frame;
19 and cord means coupled through said pulley means to said
20 hydraulic resistance means for communicating a resistive
21 force from said hydraulic resistance means along said cord
22 means and through said pulley means, said cord means thereby
23 providing an exercise device.

24 24. The improvement of Claim 23 comprising a
25 second said rectangular frame having a bicycle exercise
26 device coupled thereto said bicycle exerciser device
27 comprising:

28 a crank and sprocket drive coupled
29 across opposing inner walls of said second
30 frame;

31 a seat support stanchion pivotally coupled
32 to the crank of said drive;

33 a truss support pivotally coupled to said
34 stanchion and slide coupled to opposing
35 interior walls of said second frame; and

36 a belt driven wheel, belt coupled to
37 the sprocket of said drive and coupled to

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2 opposing interior walls of said second frame,
3 said pivotal and slide couplings of the members permitting
4 the bicycle exercise device to be folded down to a relatively
5 flat package coupled to and storable within said cabinet.

6 25. The improvement of Claim 1 further comprising
7 a rectangular frame comprised of at least two lengths of
8 said common structural element to provide a plurality of said
9 longitudinal channels in opposing outer walls of said frame
10 for coupling exercise devices across said frame to opposed
11 exterior walls thereof.

12 26. The improvement of Claim 25 further comprising
13 hydraulic resistance means coupled to said frame to be used
14 in association with exercise devices coupled across said
15 frame to exposed exterior walls thereof.

16 27. The improvement of Claim 26 further comprising
17 seating means slidably coupled across said frame and foot
18 pad means coupled to said frame said seating means and said
19 foot pad means, in cooperation with said hydraulic resistance
20 means providing a rowing exercise device.

21 28. The improvement of Claim 27 further comprising:
22 cabinet means for housing said rectangular
23 frame; and

24 coupling means for pivotally coupling said
25 rectangular frame to said cabinet to provide
26 in cooperation with said cabinet, partial support
27 for said rectangular frame and for rotating
28 said frame for storage within said cabinet.

29 29. The improvement of Claim 28, said frame being
30 pivotally coupled to said cabinet for storage therein and
31 further comprising a weight bench pivotally coupled at one
32 end of said frame for use as an exercise device when said
33 frame is stored within said cabinet.

34 30. The improvement of Claim 29 further comprising
35 pulley means lockingly, slidably coupled to said frame;
36 and cord means coupled through said pulley means to said
37 hydraulic resistance means for communicating a resistive

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2 force from said hydraulic resistance means along said cord
3 means and through said pulley means, said cord means thereby
4 providing an exercise device.

5 31. The improvement of Claim 30 comprising a second
6 said rectangular frame having a bicycle exercise device
7 coupled thereto said bicycle exercise device comprising:
8 a crank and sprocket drive coupled
9 across opposing inner walls of said second frame;
10 a seat support stanchion pivotally
11 coupled to the crank of said drive;
12 a truss support pivotally coupled to
13 said stanchion and slide coupled to opposing
14 interior walls of said second frame; and
15 a belt driven wheel, belt coupled to the
16 sprocket of said drive and coupled to opposing
17 interior walls of said second frame,
18 said pivotal and slide couplings of the members permitting
19 the bicycle exercise device to be folded down to a relatively
20 flat package coupled to and storable within said cabinet.

21 32. The improvement of Claim 1 further comprising:
22 a rectangular frame comprised of at least two or more lengths
23 of said common structural element to provide a plurality of
24 said longitudinal channels in opposing interior walls of
25 said frame for coupling exercise devices across opposed
26 interior walls of said frame, and further providing a
27 plurality of said longitudinal channels in opposing outer
28 walls of said frame for coupling exercise devices across
29 said frame to opposed exterior walls thereof.

30 33. The improvement of Claim 1 further comprising:
31 a rectangular frame comprised of two outer lengths and a
32 central length of said common structural element each said
33 common structural element length being generally parallel to
34 the longitudinal axis of said rectangular frame, said frame
35 providing a plurality of longitudinal channels in opposing
36 interior walls thereof for coupling exercise devices across
37 said opposed interior walls and further providing a plurality

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2 of longitudinal channels in the exterior walls of said frame
3 for further coupling exercise devices to said frame.

4 34. The improvement of Claim 33 further comprising
5 resistance means lockingly, slidably coupled to channels
6 of said frame for providing a resistive force exercise
7 device.

8 35. The improvement of Claim 34 further comprising
9 a first pad means slidably coupled across a first pair of
10 opposed interior walls of said frame; and a second pad means
11 slidably coupled across a second pair of opposed interior
12 walls of said frame.

13 36. The improvement of Claim 35 further comprising
14 means for grasping said resistance means in the manner of
15 ski poles, said resistance means cooperating with said first
16 and second pad means to provide a skiing type exerciser.

17 37. The improvement of Claim 35 further comprising
18 means for grasping said resistance means in the manner of
19 oars, said resistance means cooperating with said first and
20 second pad means to provide a rowing type exerciser.

21 38. The improvement of Claim 34 further comprising
22 means for coupling a person's legs to said resistance means,
23 said resistance means cooperating with said frame to provide
24 a leg lift bench exerciser.

25 39. The improvement of Claim 35 wherein said
26 resistance means further comprise at least one of means for
27 hand actuation and means for leg actuation whereby said
28 improvement selectedly provides at least one of a skiing
29 type exerciser, a rowing type exerciser, and a leg lift
30 bench exerciser.

31 40. The improvement of Claim 39 wherein said
32 frame further comprises means for inclining said frame so
33 that exercises may be performed thereon on an inclined
34 plane.

35 41. The improvement of Claim 3 further comprising
36 a bicycle exercise device coupled to said rectangular frame.

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2 42. The improvement of Claim 3 wherein said
3 rectangular frame comprises a first such frame having a
4 bicycle device coupled thereto and a second such frame
5 cooperating therewith and having a treadmill exerciser
6 device coupled thereto.

7 43. The improvement of Claim 3 wherein said rec-
8 tangular frame has coupled thereto a treadmill exerciser
9 device.

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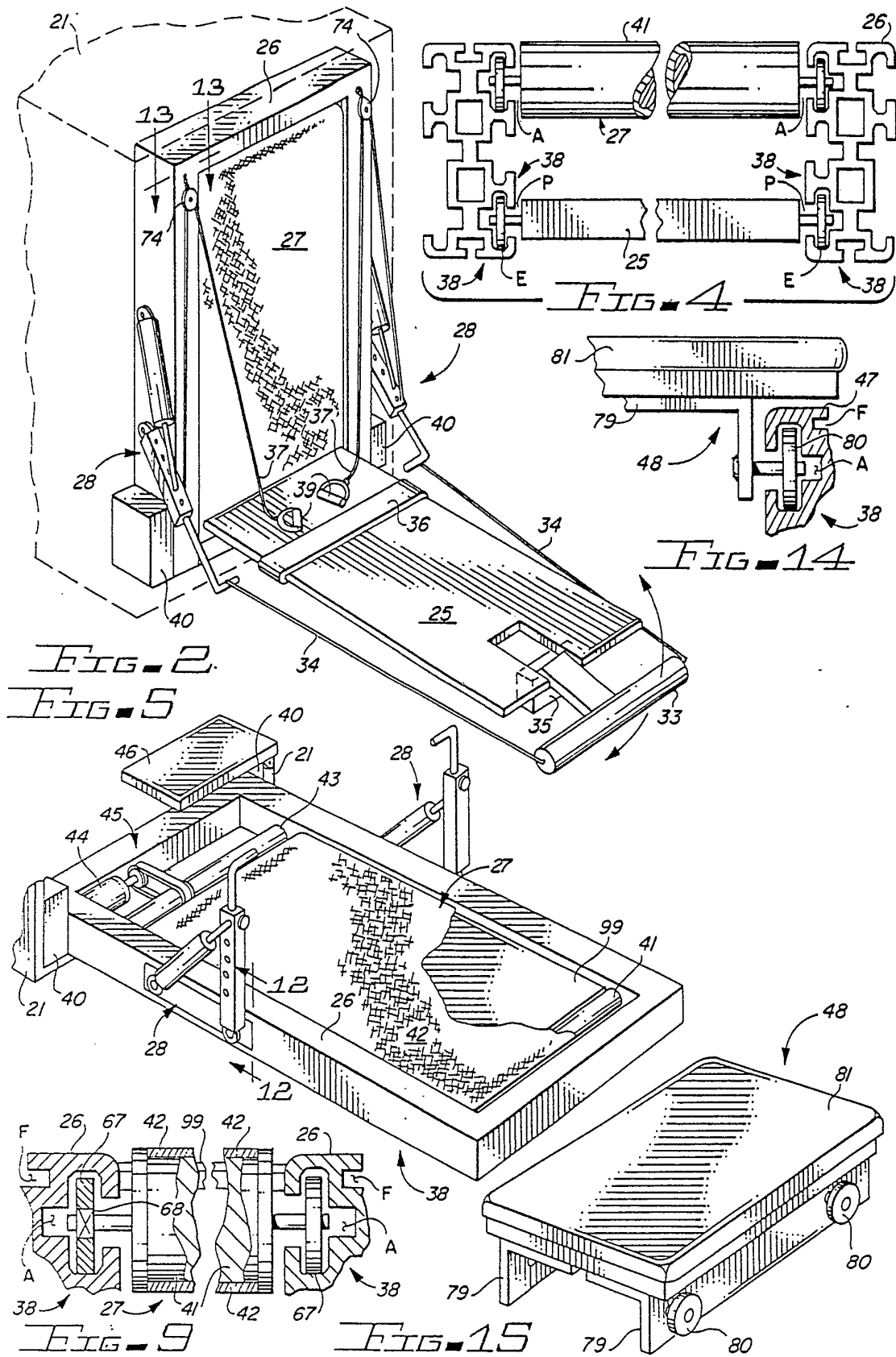
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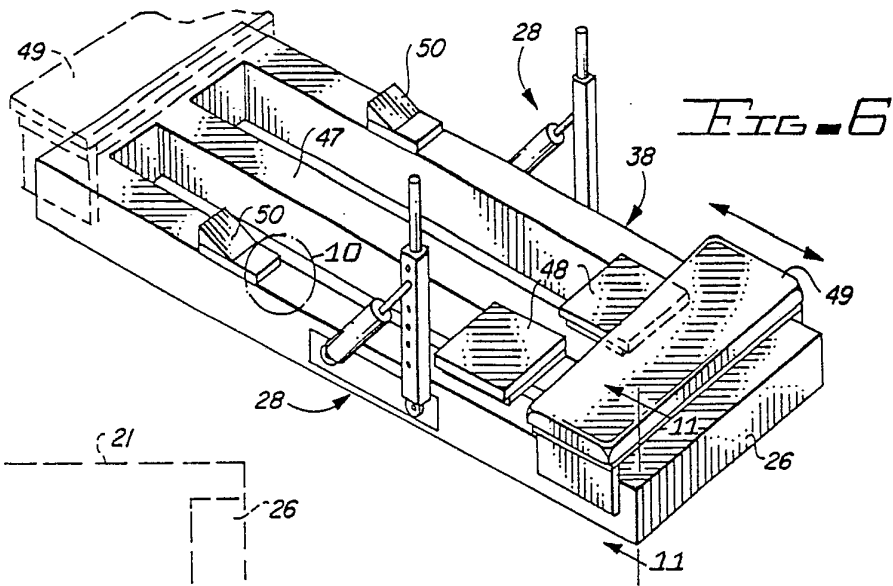


FIG. 6

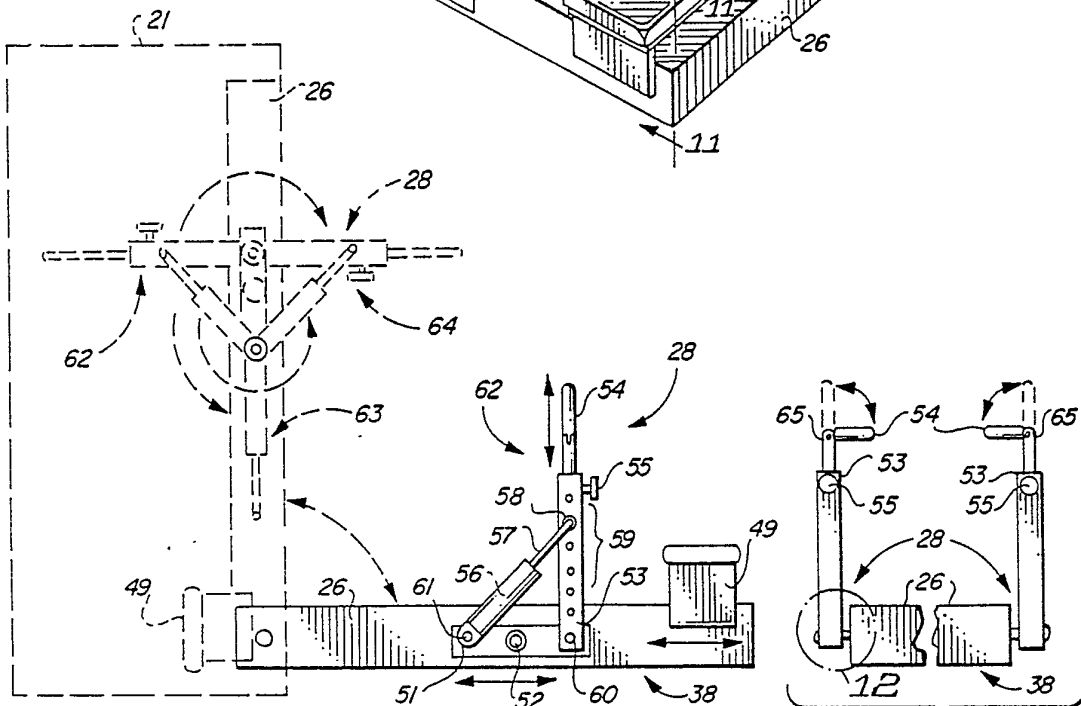


FIG. 7

FIG. 8

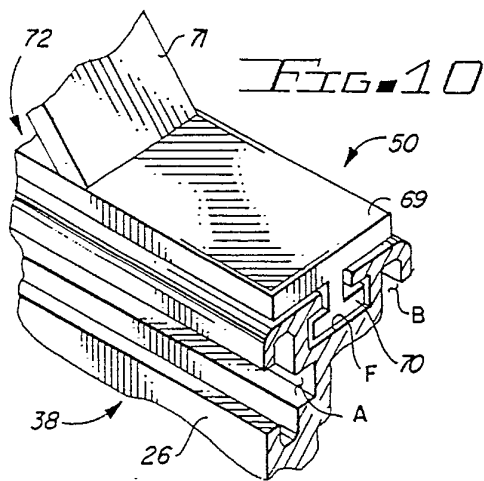


FIG. 10

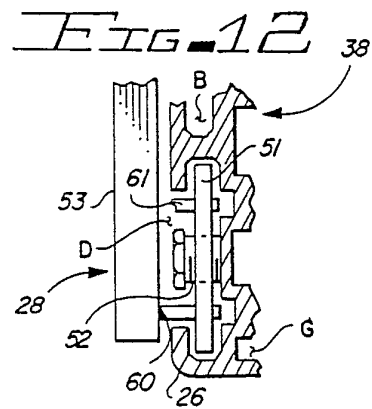


FIG. 12

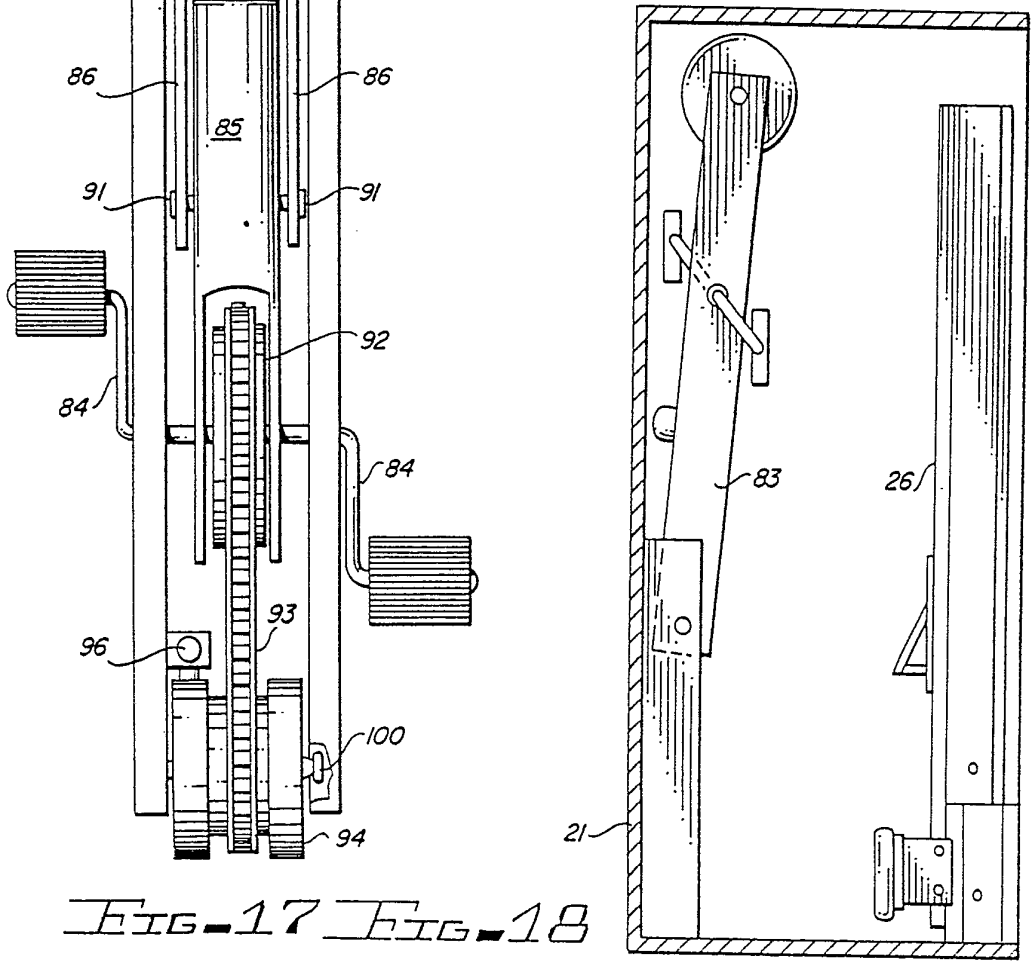
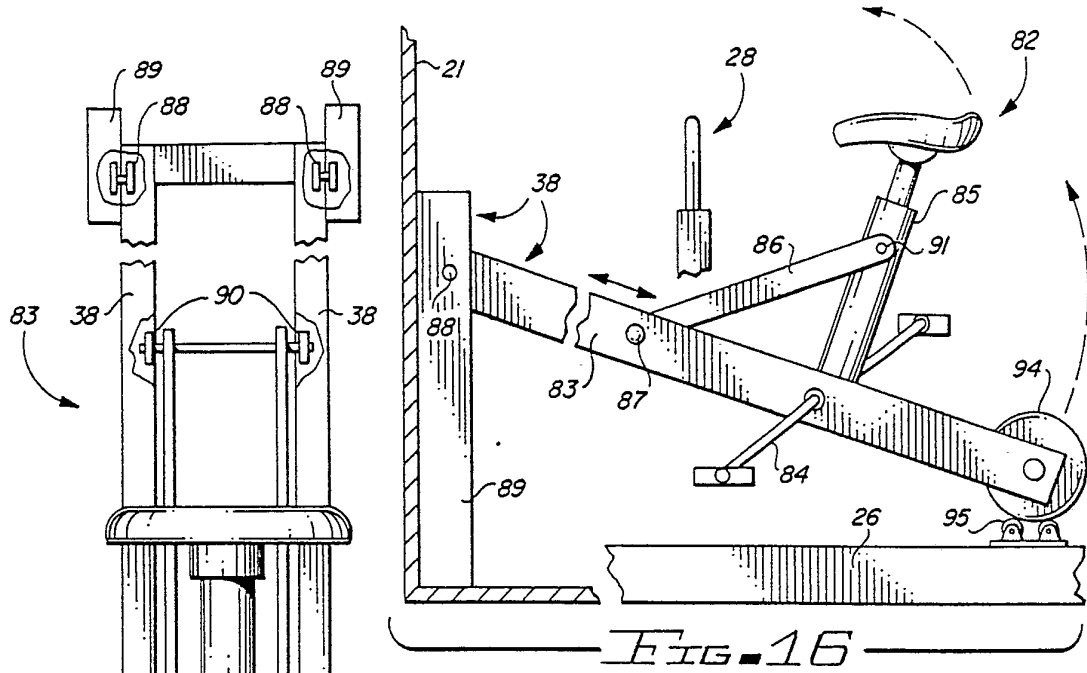


FIG. 17 FIG. 18

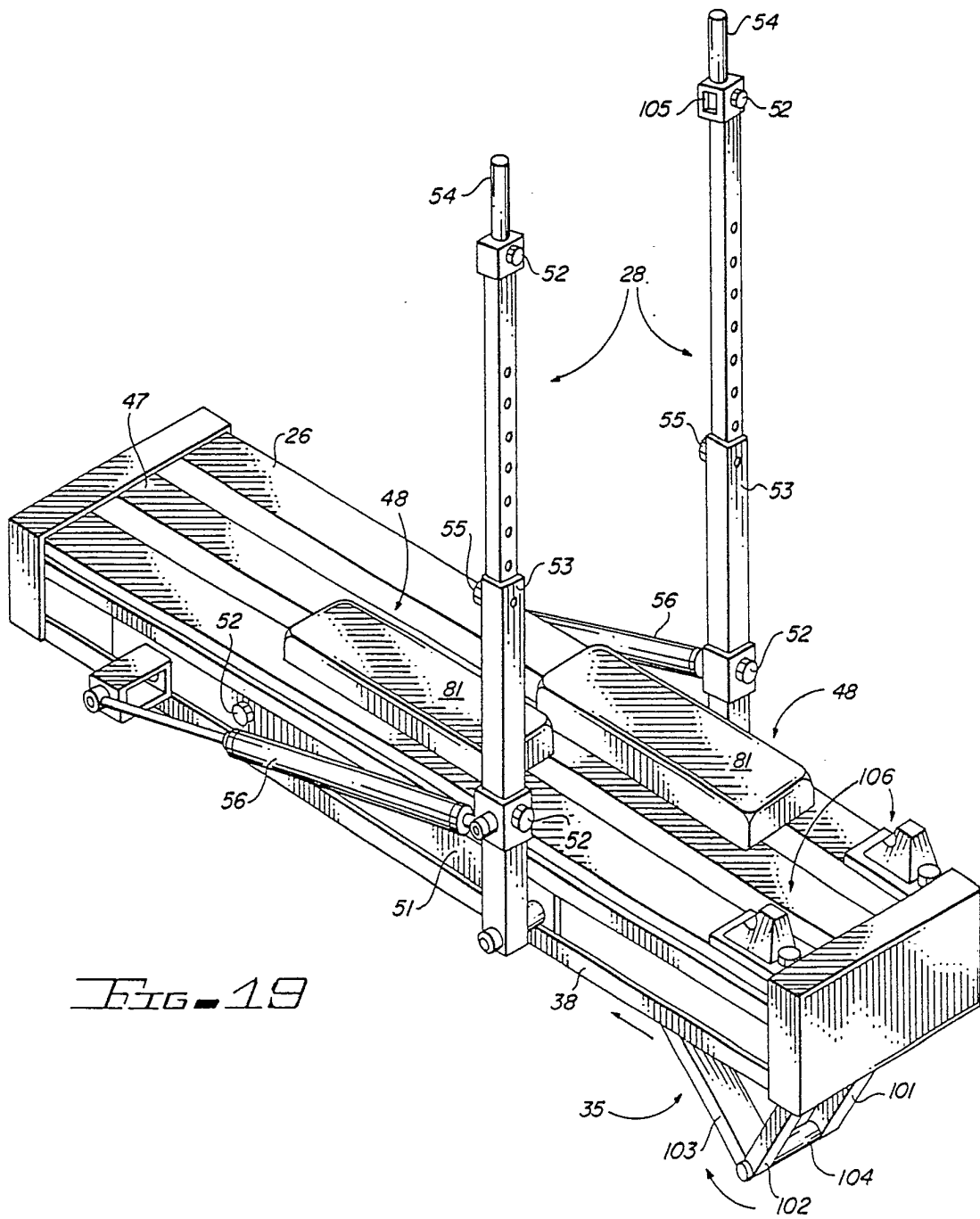


FIG. 19

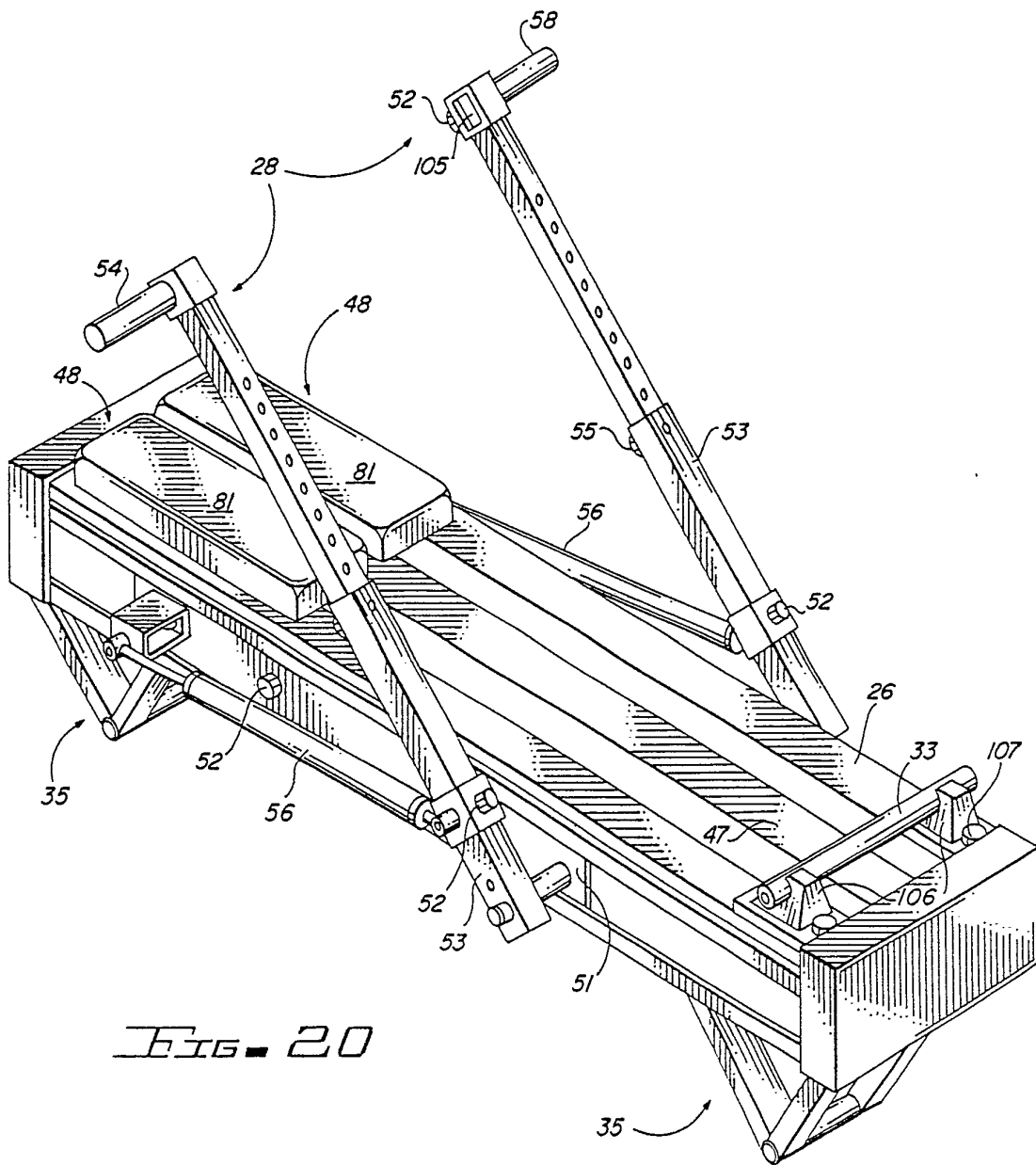
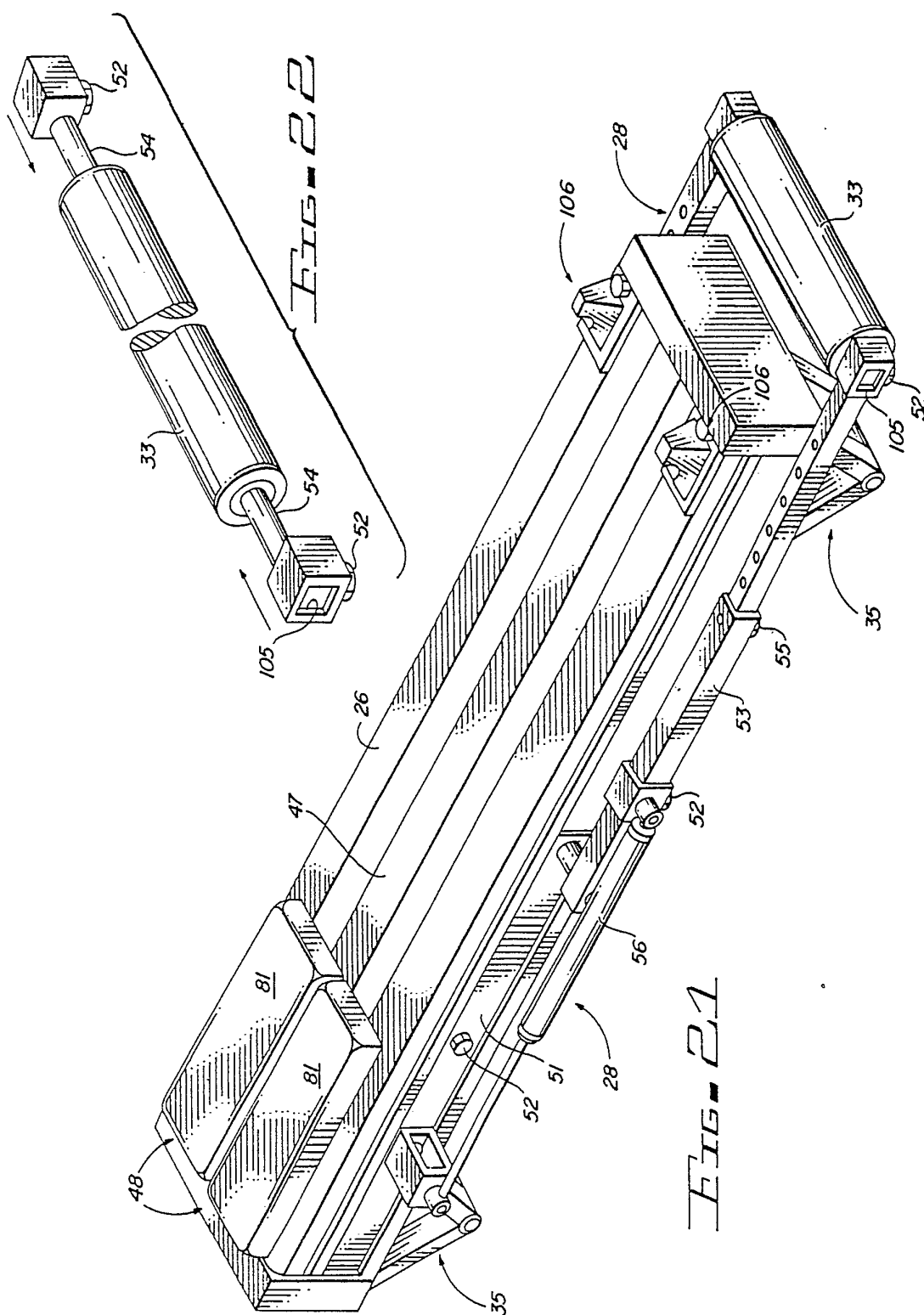


FIG. 20



INTERNATIONAL SEARCH REPORT

International Application No **PCT/US85/01324**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl. A63B 21/00 US Cl. 272/130, 143, 134, 72, 73, 97		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
U.S.	272/130, 143, 134, 72, 73, 97, 113, 117	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category *	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
Y	US 4,026,545 31 May 1977	1-42
Y	US 2,632,645 24 March 1953	3-10, 14, 19-24, 41-43, 29, 30, 31
Y	US 382,440 8 May 1888	3-10, 14, 19-24, 41-43
Y	US 554,754 1 st February 1896	4, 10, 18, 24, 31, 41-43
Y	US 3,266,801 16 August 1966	5, 6, 37, 39, 40
Y	US 4,477,071 16 October 1984	8, 9, 12, 13, 16, 17, 26-31
(con'td)		
<p>* Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ²	Date of Mailing of this International Search Report ²	
12-16-85	26 DEC 1985	
International Searching Authority ¹	Signature of Authorized Officer ²⁰	
ISA/US	<i>William R. Brown</i>	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No ¹⁸
Y	US 4,066,257 3 January 1978	14,15-18
Y, P	US 4,529,194 16 July 1985	20-24, 35-40
Y	US 4,047,715 13 September 1977	27-31
Y	US 4,429,871 7 February 1984	38,39