(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 587 587 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
03.10.2007 Bulletin 2007/40

(21) Application number: **04704270.0**

(22) Date of filing: **22.01.2004**

(51) Int Cl.:
A63B 21/062 *(2006.01)* ***A63B 23/035*** *(2006.01)*

(86) International application number:
PCT/GB2004/000275

(87) International publication number:
WO 2004/067107 (12.08.2004 Gazette 2004/33)

(54) **Chair type exercise apparatus**

Stuhlartiges Übungsgerät

Appareil d'exercice de type chaise

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

(30) Priority: **28.01.2003 GB 0301962**

(43) Date of publication of application:
26.10.2005 Bulletin 2005/43

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Printed by Jouve, 75001 PARIS (FR)

Description

Field of Invention

[0001] This invention relates to exercise apparatus configured as a chair. It relates particularly to an exercise apparatus that is suited to being used in the home or office rather than in a commercial fitness centre.

Description of prior art

[0002] Many users of exercise apparatus do of course have a multiple exercise unit in their home, but these units are large and bulky and usually have to be situated in a special room, a bedroom, or garage, since they do not fit in well alongside conventional furniture pieces. There is therefore a requirement to provide exercise apparatus that would not look out of place in an ordinary home or office environment. There have been earlier attempts to provide an exercise apparatus according to the preamble of claim 1 that was formed in the shape of a chair and one of these is disclosed in patent number US6306067

[0003] This apparatus indicates pulley system with handles and a weight which is attached to a couch but is a separate unit and not part of the construction It has only a limited amount of exercises that can be performed and the seating position does not alter from passive to exercise mode.

[0004] The present invention as defined by claim 1 was devised to provide an exercise apparatus that is incorporated into the chair itself and not a separate unit and would be able to exercise and tone as many muscle groups of the body as possible, to provide a complete training workout. Conventional machines which perform this function, are usually tall in height and thus they do not have a compact shape that would blend well with conventional home or office furniture pieces. The invention attempts to provide a compact construction of multifunction exercise apparatus.

[0005] According to the invention, there is an exercise apparatus having a seat portion and a backrest in the configuration of a chair. In a first passive mode conceals the presence of a plurality of exercise elements which together form an exercise apparatus, and in a second exercise mode reveals one or more of said exercise elements for a use. The position of the seat portion may be manually raised and locked in a position with respect to a base portion and support surface on which the apparatus stands when the apparatus is moved between its first passive mode and the second exercise mode. The seat portion may be raised and tilted to a position parallel to the support surface when the chair is altered from the first mode to said second exercise mode.

[0006] The chair may include supporting frame elements, which are interconnected, and manually operable to allow movement of the seat portion between said modes. At least two frame elements may interlock to provide a locking mechanism to secure the chair in said second exercise mode, the locking mechanism being releasable by the movement of one of said frame elements. The exercise elements are connected to resistant elements configured to comprise a single resistance source, which is adjustable to vary the resistance to movement encountered by a user at the exercise elements. The resistance source comprises a set of freely mounted weights. The free weights may be movable along retractable guides which decrease in length when the chair is moved from its exercise mode to the passive mode. The resistance source may be selected from one or more resistance means such as springs, tension bands including rubber ropes, hydraulic or pneumatic cylinders, a set of free weights, electromagnetic resistance means, or dynamic friction mechanisms. The resistance source is disposed centrally at the rear of the backrest. The backrest may include a pair of opposed side panels, which are capable of being opened to allow access to a pair of exercise elements, adapted to operate together against a single resistance source. The exercise elements may include a 'butterfly' mechanism having a pair of butterfly arms each of which is rotatable about a secured pivot at elbow or arm support level against the resistance to movement provided by said resistance source.

[0007] Each butterfly arm may include a constant resistance means effective to ensure the resistance to movement of the butterfly arm is substantially retained throughout the stroke. The connecting elements may be attached to resistance elements for use as a chest press exercise means. The backrest may include a centrally disposed support beam having attachment means for a 'high pull' exercise element, having a resistance to movement provided by the said single resistance source. The seat portion may have an exposed front edge to which there is hingedly attached an exercise element movable against a resistance source. The exercise element being so shaped as to provide exercise regimes for two or more separate muscle groups. The hingedly attached exercise element may have an arc element piece or other elements attached to provide a downward force resisting upward movement. The exercise element may be securable in a fixed extended position and to which there is attachable a cycle crank mechanism having a pair of pedals connected via a rotatable shank. The resistance to rotation of the pedals being provided by an adjustable friction sleeve. By way of example, some particular embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 shows the exercise apparatus in the form of a conventional side chair for home or office use,

Figure 2 shows the chair frame after removal of upholstery panels,

Figure 3 shows how upholstery panels may be fitted to the chair frame,

Figure 4 is a partial side view of a leg extension el-

ement when in use,

Figure 5 is a front view of the Figure 4 detail,

Figure 6 is a side view of the chair when in use for a biceps curls exercise,

Figure 7 is a partial perspective view of the back frame top element,

Figure 8 shows the butterfly pad,

Figure 9 shows the butterfly arm, spacer arm and pivot rod end,

Figure 10 shows the cable connections from the weight stack to the various exercise modules,

Figure 11 shows an alternative embodiment of the exercise apparatus,

Figure 12 is a perspective view of the apparatus showing the internal mechanism,

Figure 13 is a side view of the leg extension mechanism showing the method of exercising,

Figure 14 is a side view of the bicycle exercise module,

Figure 15 is a side view of the bicycle pedal resistance mechanism,

Figure 16 shows the means for locking the base frame and seat frame in a fixed position,

Figure 17 shows a side section of the apparatus in exercise mode,

Figure 18 is a perspective view of the butterfly mechanism,

Figure 19 depicts the butterfly arm and pivot rod,

Figure 20 shows the cable connections to the weight stack,

Figure 21 shows upholstery panels and cushions, and,

Figure 22 shows the base frame and seat frame with extension arms.

[0008] Figure 22a shows seat frame and alternative seat raising elements.

[0009] The exercise apparatus has the general appearance of an ordinary chair until it is required to be modified by a user to form the multifunction exercise unit.

[0010] The apparatus is provided with a chair seat 47, a back support 48 and arm rests 51. The arm rests can be fixed, pivoted or removable. Figure 2 shows the basic structural components of the chair including a back frame upright element 41, lower support element 45, top element 62 and first pulley 6. An extended top element 33 carries a second pulley 34.A seat structure comprises a seat frame 40 (Figure 3) attached to the back frame upright element 41 and which carries a pivot housing 15 for supporting butterfly arms. The seat frame 40 has an extension element arranged for enabling the length of the seat to be increased when the apparatus is arranged in the exercise mode. A lower base support element 42 (Figure 3) which is attached by a hinge 46 to the lower support element 45 also is provided with a front support element 43.

[0011] A height element 36 is attached between the lower base support element 42 and the seat frame 40. The extended top element 33 (Figure 3) is raised and secured in a position above the back of the chair and having the second pulley 34 is attached to the top extremity.

[0012] A butterfly arm element at elbow or arm support level consists of pivot housing15 (Figure 7) carrying a butterfly pivot rod 65 (Figure 9) and fixed to the seat frame 40. The butterfly pivot rod 65 is connected to the butterfly arm 10 (Figure 9) having a separate cable spacer arm 11 pivoted to it. The vertical piece of the butterfly arm is a hollow section and this houses an adjustable butterfly handgrip 66. The butterfly arm 10 is also connected to the cable spacer arm 11 by means of a connecting link 9 which serves to pull the cable spacer arm rotating on a vertical axis. The cable spacer arm 11 has two vertical anchor rods 14 where the cable 16 (Figure 9) passes through. The cable 16 passes through a cable stop 12 and with a simple fixing this is held in position along the cable 16. When the butterfly module is used, force is exerted against forearm pads 13 (Figure 8) that in turn rotate the cable spacer 11 via the connecting link 9. The cable spacer arm 11 allows the force exerted on the butterfly arm 10 to be kept relatively constant, as the arm 10 rotates allowing the cable 16 to be kept at a constant radius from the pivot point. As the arm 11 rotates it pulls cable stop 12 and pulls the cable 16, which is connected to a floating pulley 17. The floating pulley 17 is connected to cable 35, it transmits the force to the weight stack by the connection 7 and cable 8 (Figure 10).The pectoral bar 25 (Figure 7) or handgrip 81 can be attached to a hook 26 on the cable 16 which passes through the anchor rods 14. When the pectoral bar 25 or handgrip 81 is pushed forward, the force exerted is transmitted to the weight stack by means of cable 16, floating pulley 17 to cable 35. Cable 35 is joined to the connection 7 coupled to cable 8 which is connected to a weight stack pick-up rod 3 and the force is thus transmitted to the weight stack.

[0013] A stomach exercise effect is achieved by pushing the pectoral bar 25 forward against the bar with the user's chest. The pectoral bar 25 and handgrip 81 can then be disconnected when not in use A leg extension element is provided by a front extension element 22 (Figure 4) and member 23 with an elbow joint along its length and hinged at its upper extremity to the seat extension element 28. This hinge allows the front extension element 22 to swing freely when the apparatus is in exercise mode. Attached to the front extension element 22 is a cable spacer piece 24 (Figure 4) which rotates as the front extension elements 22 rotate. A front cross bar 29 is attached to the front extension member 23 (Figure 4). The front cross bar 29 (Figure 5) has a protective material cushioning the user's ankles when in use.

[0014] The front cross bar 29 can be extended or retracted according to the leg length of the apparatus user by means of a thumb screw 39. When the extension elements 22, 23 are pushed forwards and upwards, they do not follow in a perfect arc and tend to ride upwards

on the leg of the apparatus user. In order to prevent this situation, an arc element 37 (Figure 4) is attached to the elbow of the front extension element 22 which serves to pull it in a downward direction.

[0015] A biceps curl exercise is achieved by lifting the front cross bar 29 which acts as a handgrip bar for this exercise. As the handgrip is pulled upwards, the force exerted is transmitted to cable 8 which passes under the cable spacer piece 24 keeping it at a constant radius from the hinge 27. The cable spacer piece allows a constant force to be felt by the apparatus user as the extension elements are raised. The force on cable 8 is then transmitted to the weight stack pick-up rod 3 which in turn lifts the weight stack. A rowing exercise is achieved by pulling the front cross bar 29 away from the chair structure while the apparatus user is seated on the floor. As the cross bar 29 is pulled away from the chair, force is exerted to cable 8 which is then transmitted to the weight stack pick-up rod 3 which in turn lifts the weight stack .The weight stack 1 (Figure 10) is of a conventional construction comprising a stack of rectangular weights slide-mounted on to a pair of vertical guides 4. Each weight is provided with a central horizontal hole registering with a respective hole in the weight stack pick-up rod 3. The central pick-up rod 3 has a lift cable 8 attached and this passes over the first pulley 6. The amount of weight to be lifted is selected by engaging a lock pin 2 through the appropriate hole in the weight stack and then into the pick-up rod 3. Thus when the cable is adequately tensioned the selected number of weights in the stack will be lifted. The cable function depicted in Figure 10 comprises five cables namely, cable 8, connected to the weight stack pick-up rod 3 passing over the first pulley 6, down under the pulley 18 to pulley 21 onto the leg extension module and being connected to front extension member 23. Cable 35 is joined to cable 8 by a connection 7 which can be simply a ring connected to cable 8. Cable 35 is joined to connection 7 then passes down under pulleys 19 and 20 and is connected to a floating pulley coupling 17 (Figure 10). Cable 16 passes through the floating pulley 17 over pulley 5 and has a hook 26 at each of the extremities of the cable 16. The hook 26 is attached to each end of the pectoral bar 25, or hand grips 81 (Figure 7) by means of a ring fastening. When the pectoral bar 25 or handgrip 81 is pushed forward; force is transmitted from cable 16 to cable 35 via floating pulley 17 which is connected to cable 8 via connection 7. The force is then transmitted to the weight stack pick-up rod 3 where the appropriate number of weights is lifted.

[0016] Cable 16 has a cable stop 12 secured along each side of its length (Figure 10) which is secured onto vertical anchor rods 14 fixed to the cable spacer arm 11. When the forearm pad 13 is rotated in a forward direction, it rotates the cable spacer arm via connecting link 9 and transmits the force to the weight stack as described above. Cable 31 is also connected to the weight stack pick-up rod 3 (Figure 10) and to connection 36. When the extended top element 33 is attached to the upper support bearing beam a second cable 31a is joined to cable 31 via a connection 36 and then travels over the second pulley 34 and to a hook or connection on the high pull bar 32.

[0017] When the high pull bar is pulled downwards force is transmitted via cable 31a and through cable 31 to the weight stack 1 as described. The basic upholstery arrangement of the exercise apparatus includes a padded side panel 49 (Figure 3) which is fixed to the back frame upright element 41 with side panels 50 that are made to be hinged, rotated or removable to give access to the butterfly elements. The back support 48 (Figure 3) is secured to the back frame element and the seat frame element and is padded or suitably upholstered. The chair seat 47 is a normal firm padded seat which can slide forward with the extended seat element. The arm rests 51 of the chair can be hinged or removed when the apparatus is required for use in the exercise mode. When the butterfly mechanism has been stowed away, the side panels 50 (Figure 3) can be placed in position and the exercise apparatus becomes converted to a chair.

[0018] Figure 11 shows an alternative embodiment of the exercise apparatus where, when not required for training purposes, the apparatus can have the appearance and use of a conventional comfortable armchair. The exercise apparatus comprises a strong-ridged base frame 153 (Figure 22) and a strong-ridged seat frame 154. The base frame and seat frame are secured together by rotating extension arms 155 and 172 (Figure 16) and held in the raised position by locking arms 156. The locking mechanism consists of a square section bar 167 placed across the base frame 153 (Figure 16) which rotates by means of a pull arm 169 or a handle 192 (Figure 16). The locking arm has a square section cut out which locks onto the bar 167 when lifted up to exercise mode. A spring 157 (Figure 16) forces the locking arms 156 back onto the square section bar 167 securing the seat in an exercise mode. The square section bar 167 has an extension piece 168 attached at either side of the bar where the locking bar is positioned, and when the square bar 167 is rotated it forces the locking arm free from the square bar allowing the seat frame 154 to be lowered onto the base frame 153 and base side structures. To raise the seat frame it is simply lifted up from the back, and it is automatically held in position by the locking arms 156 as they lock into position. The rear rotating extension arms are longer than the front rotating extension arm allowing the back of the seat frame to rise higher than the front of the frame.

[0019] The rear extension arms 155 have a mechanism such as a spring, gas strut, rubber band or hydraulic lift 176 (Figure 17) attached to the lower end and to the side base frame 158 in order to counterbalance the weight of the seat thus making it easier to lift. There are two side base structures 158 and two side structures 159 as shown in Figure 17. The side base structures 158 are fixed to the base frame 153 (Figure 17) and the side seat structures 159 are secured to the seat frame 154. At-

tached to the side base structures 158 at the lower edge is a pulley wheel bar 175 (Figure 12), with two pulley wheels 120, 121 (Figure 20) attached to its centre position.

[0020] Also attached at the lower edge of the side base structures 158 is a weight stack support frame 174 with pulley wheels 118, 119 (Figure 20) attached centrally. There are heavy-duty wheel castors 193 (Figure 12) also secured to the lower edge of the side base structure, which allows the chair to be easily moved. The side seat structures 159 are of an L-shape, and a vertical back 160 (Figure 19) is attached to its vertical edge stabilizing the structure. Attached to the top of the L-shaped side seat structure is an upper load bearing support frame 162 (Figure 18) which is also secured to the vertical back 160. The upper load bearing frame 162 consists of a rectangular frame with a pulley wheel 106 (Figure 18) between the frame at its centre position and parallel to the side seat structure. The rear member of the upper load bearing support frame is a load-bearing beam having a hole in its central position. There are two flexible weight guides secured at the top extremity to the load-bearing beam by means of the clamps 163 (Figure 18). The lower extremity of the flexible weight guide is secured to the weight stack support frame, which is fixed to the base side structure. When the chair is lifted and locked into the exercise mode, the flexible guides become tight and taut allowing the weights to slide freely up and down their length.

[0021] A high pull extension piece 133 (Figure 18) is secured to the centre of a load bearing beam which forms the back of the load bearing frame 142 (Figure 18). The high pull extension piece consists of a rod or bar secured at its lower extremity into the hole of the load bearing beam and having a pulley wheel 134 (Figure 20) attached to the top extremity. A butterfly arm mechanism comprises a pivot housing 115 (Figure 18) having a friction insert, housing the butterfly pivot rod 165 (Figure 19) and fixed to the side of the L-shaped seat structure 159. The pivot rod 165 is connected to the butterfly arm 110 (Figure 19) having a separate cable spacer arm 111 (Figure 18) pivoted to it. The vertical piece of the butterfly arm is a hollow section and houses an adjustable butterfly handgrip 166.

[0022] The butterfly arm 110 is also connected to the cable spacer arm 111, by means of a connecting link 109 which pulls the cable spacer arm rotating on a vertical axis about pivot point 165a in a circular motion. The arm 111 has two vertical anchor rods 114 where the cable 116 (Figure 18) passes through. The cable 116 passes through a cable stop 112 which with a simple fixing is held in position along the cable 116. When the butterfly module is used, force is exerted against forearm pads 113 (Figure 20) that in turn rotates cable spacer 111 via the connecting link 109. The cable spacer 111 allows the force exerted on butterfly arm 110 to be relatively constant, as the arm 110 rotates allowing the cable 116 to be kept at a constant radius from pivot point 165a. As the arm 111 rotates it pulls cable stop 112 and pulls cable 16, which is connected to a floating pulley 17. The floating pulley 117 connected to cable 135,transmits the force to the weight stack by connection 107 and cable108 (Figure 20).

[0023] A pectoral bar 125 or handgrip 181 can be attached to a hook 126 on the cable 116 which passes through anchor 114. When the pectoral bar 125 or handgrip 181 is pushed forward, the force exerted is transmitted to the weight stack via cable 116, coupling the floating pulley 117 to cable 135. Cable 135 is connected to cables 107 and 108 which are connected to lifting rod 103 and the force is thereby transmitted to the weight stack. A stomach exercise is achieved by pushing the pectoral bar 125 forward against the bar with the chest. The pectoral bar 125 and handgrip 181 can then be disconnected when not in use. A leg extension mechanism as depicted in Figure 13 comprises two parallel extension arms 122 and a hollow tubular front extension arm 123 connected inside the two arms by an elbow pivot 140.

[0024] The top of the arms 122 is attached to the front member 128 of the seat frame 154 by means of a hinge 127. This hinge allows the two arms to swing freely when in exercise mode. Attached to extension arms 122 is a cable spacer piece 124 (Figure 20) which rotates as the arms 122 rotate. A tee piece 129 slides inside the extension arm 123 (Figure 13). The front cross bar is provided with a protective material cover for cushioning the user's ankles when the apparatus is in use. The tee piece 129 can be extended or retracted according to the leg length of the apparatus user by adjustment of a thumb screw 139. The feet of the exercise apparatus user may be hooked under the front cross bar 129 and raised and lowered against the resistance of the weight stack via cable 108. When the extension arms 122, 123 are pushed forwards and upwards they do not traverse in a perfect arc and tend to ride up on the leg of the user.

[0025] In order to prevent this effect occurring, another instep foot bar 130 pivoting on swivel arms 173 (Figure 13) is placed under the cross bar and this provision serves to keep the tee piece in a constant position on the user's ankle. For a biceps curl exercise, the instep foot bar 130 is lifted and this component then also acts as a handgrip bar for this exercise. As the handgrip is pulled upwards the force exerted is transmitted to cable 108 which passes under the cable spacer arm 124 keeping it at a constant radius from the hinge 127.

[0026] The cable spacer piece allows a constant force to be felt by the apparatus user as the extension arms are raised. The force on cable 108 is then transmitted to the weight stack pick up rod 103 which in turn lifts the weight stack. A rowing exercise is achieved by pulling the instep bar 130 away from the chair while the apparatus user is seated on the floor. As the instep bar 130 is pulled away from the chair, force is applied to cable 108 which is then transmitted to the weight stack pick up rod 103 which in turn lifts the weight stack.A bicycle attachment can be connected to the leg extension module as shown in Figure 14.The bar 150 is of a square section material usually metal having a connection lug 149 at-

tached. This connection lug slots into the square hollow section extension arm 123. The bar 150 is held in position on the two arms 122 by a bolt with a hand turn knob 147 passing through the bar 150 and tightened with cross plates 147a onto the arms 122. The pedal arm is a Z-shape with rod 151 being held onto a sliding tube 181 by a clamp 177 and 179 and a turn bolt 148. The rod has two standard bicycle pedals 152 attached on either side of the rotatable crankshaft. The crankshaft formed by the rod 151 passes through a friction sleeve 180 and as the turn bolt 148 is tightened the friction on the crankshaft will increase thus causing the apparatus user to apply a greater physical force to turn the pedals 152.

[0027] The tube 181 slides along bar 150 to allow the apparatus user to adjust the position of the pedals to suit the individual leg length The tube 181 is kept in position along bar 150 by a turn bolt 178 (Figure 15). Figure 20 shows the connection links which are used to access the weight stack which is provided with rectangular weight bodies that are mounted on a pair of flexible vertical guides 104. Each weight having a central horizontal hole registering with a respective hole in the pick-up rod 103. The central pick-up rod has a lift cable 108 attached which passes over a pulley wheel 106. The amount of weight to be lifted is selected by engaging a lock pin 102 through the appropriate hole in the weight stack and into the pick-up rod 103. Thus when the cable is adequately tensioned the selected number of weights in the stack will be lifted.

[0028] The cable function depicted in Figure 20 comprises mainly five cables which are cable 108, connected to the pick-up rod 103 passing over the pulley wheel 106 down under the pulley wheel 118, to pulley wheel 121 onto the leg extension module and connected to front extension tube 123. Cable 135 is connected to cable 108 by a coupling 107, which can be a simple ring fastened to cable 108 where the cable 135 is fastened. Cable 135 is connected to coupling 107, then passes down under pulleys 119 and 120 and is connected to a floating pulley coupling 117 (Figure 20). Cable 116 passes through the floating pulley 117 over pulley 5 and has a hook 126 at each of the extremities of the cable 116. The hook 126 is attached to each end the pectoral bar 125 or hand grips 181 (Figure 18) by means of a ring fastening. When the pectoral bar 125, or hand grips 181 is pushed forward, force is transmitted from cable 116 to cable 135 via floating pulley 117 which is connected to cable 108 via connection 107. The force is then transmitted to pick up rod 103 where the appropriate number of weights are lifted. Cable 116 has a cable stop 112 secured along each side of its length (Figure 20) which hooks onto vertical anchor rods 114 fixed to the cable spacer arm 111. When the butterfly press pad 113 is rotated in a forward direction, it rotates the cable spacer arm via connecting link 109 and transmits the force to the weight stack as described above. Cable 131 is also connected to pick up rod 103 (Figure 20) and to connection 136. When the high pull extension piece 133 is attached to the upper support bearing beam a second cable 131a is connected to cable 131 via a coupling 136 and then travels over pulley wheel 134 and to a hook or connection on the high pull bar 132. When the high pull bar is pulled downwards, force is transmitted via cable 131 a and via cable 131 to the weight stack 1 as described .The basic upholstery of the exercise apparatus armchair is a padded side panel 182, 183 (Figure 21) fixed to the side base structure 158 and to the side seat structure 169 and covered with an upholstery material. The back support 160 (Figure 21) is secured to the vertical edge of the seat side structure 159 and an upholstered panel 186 attached thereto forming the padded back of the exercise chair. The side flaps 190 conceal the back panel 159a and the butterfly arms 110. The side flaps are flexibly hinged at the lower edge to the outside arm of the chair, and held in position by the upholstery material on the back panel 186. The seat of the chair is a normal firm conventional cushion 185 placed onto the seat frame 154. The top portion of the backrest 187 (Figure 21) consists of an upholstered top panel secured to the load bearing frame with an opening at its centre for the high pull extension piece.

[0029] A specially shaped cushion 188 is placed over the arms of the chair to conceal the butterfly rod housing. A fixing piece 191 is secured to the front member 128 of the seat frame 154 (Figure 12) to which the front upholstered panel or material 189 is fastened concealing the leg extension mechanism. The back panel 159a (Figure 18), the top upholstered panel 187, the padded back panel 186, and side arms 183 (Figure 21) form a recess at the rear of the backrest 160 where all of the butterfly mechanism can be stowed away. When the butterfly mechanism is thus stowed, the side flaps 190 (Figure 21) can be placed in position and the exercise apparatus has been converted again to an armchair configuration. The exercise apparatus of the invention has been found to provide a practical construction of machine that may be built at a reasonable cost. The invention provides an armchair that does not look out of place in a living room or office but which can be transformed into an exercise machine within seconds. The seat of the chair lifts up and it is locked in position for performing multiple exercises, and thus exercising most of the body muscle groups in a normal workout. Each exercise routine operates independently and the apparatus enables many routines to be performed that are normally undertaken only on a much larger machine. When the apparatus is not in use, it is simply lowered down and it returns to the appearance of a comfortable armchair.

[0030] The foregoing description of embodiments of the invention has been given by way of example only, and a number of modifications may be made without departing from the scope of the invention as defined in the appended claims.

[0031] For instance, the vertical guides which serve to retain the weights of the weight stack 1 in alignment with one another, could be replaced by end or corner guides which are located adjacent to the outer edges of the weights.

Claims

1. An exercise apparatus in the configuration of a chair, having a seat portion (47) and a backrest (48), which in a first passive mode conceals the presence of a plurality of exercise elements (10, 22, 23, 32) which together form an exercise apparatus, and in a second exercise mode reveals one or more of said exercise elements (10, 22, 23, 32) for a user, in which said exercise elements (10, 22, 23, 32) are connected to resistance elements configured to comprise a single resistance source (1-3) which is adjustable to vary the exercise loading, encountered by the user at said exercise elements, in which the resistance source (1-3) comprises of a set of free weights (1) **characterized in that** the position of the seat portion being raised and locked (156) in a position with respect to the base portion when the apparatus is moved between its first passive mode and the second exercise mode, and **in that** the set of free weights is disposed centrally inside the backrest.

2. An exercise apparatus as claimed in Claim 1, in which the free weights (1) are movable along folding up stand guide elements (4 Fig 2) which can retract in height when the exercise apparatus is moved from an exercise mode to a passive mode

3. An exercise apparatus as claimed in the preceding claims, in which the backrest (48) includes a pair of opposed side panels (50 Fig 3) which are capable of being opened to allow access to a pair of exercise elements (10) adapted to operate together against a single resistance source.

4. An exercise apparatus as claimed in Claim 1, in which the exercise elements include a 'butterfly' mechanism (10) having a pair of butterfly arms (10 Fig 7) at elbow or arm rest height each of which is revolvable about a secured pivot (15 Fig 7) against the resistance to movement provided by said single resistance source (1 Fig 2).

5. An exercise apparatus as claimed in Claim 4, in which each butterfly arm (10) includes a constant resistance means (11 Fig 7) effective to ensure the resistance to movement of the butterfly arms (10) is substantially retained throughout the stroke.

6. An exercise apparatus as claimed in any preceding claim, in which connecting elements are attached to a single resistance source for use as a chest press exercise (25 Fig 10).

7. An exercise apparatus as claimed in any preceding claim, in which the backrest (48) includes a centrally disposed support beam (33 Fig 2) having attachment means for a 'high pull' exercise element and having a resistance to movement provided by said single resistance source (1 Fig 2).

8. An exercise apparatus as claimed in any preceding claim, in which the seat portion (47) has an exposed front edge to which there is hingedly attached an exercise element (122 /123 Fig 13) movable against a single resistance source, the exercise element being so shaped as to provide exercise regimes and having an arc element piece (24 Fig 4) or other elements attached (37 Fig 4) to provide a downward force resisting upward movement for two or more separate muscle groups.

9. An exercise apparatus as claimed in Claim 8, in which the exercise element is securable in a fixed extended position and to which there is attachable a cycle crank mechanism (Fig 14) having a pair of pedals connected via a rotatable shank (151 Fig 15) resistance to rotation of the pedals being provided by an adjustable friction sleeve (180 Fig 15).

10. An exercise apparatus as in claim 2 in which the single resistance source comprises a set of free weights (1) where up stand guide elements (4 Fig 2) are located adjacent to the outer edges of the weights, facilitating easy removal of the weights.

11. An exercise apparatus as claimed in Claim 1, in which the resistance source (1) is selected from one or more resistance means including, springs, tension bands, rubber ropes, hydraulic or pneumatic pressure systems, cylinders, a set of free weights, electromagnetic resistance means, or dynamic friction mechanisms.

Patentansprüche

1. Ein Übungsgerät, das eine Sitzfläche (47) und eine Rückenlehne (48) in der Gestalt eines Stuhls aufweist, welches in einem erstem passiven Modus das Vorhandensein von einer Vielzahl von Übungselementen (10,22,23,32) verbirgt und erst in einem zweiten Übungsmodus dem Benutzer eines oder mehrere der besagten Übungen offenbart, (10,22,23,32,) bei dem die Position der Sitzfläche per Hand angehoben werden und in einer Position hinsichtlich des Unterteils und der Stützoberfläche festgestellt werden kann, wenn der Apparat von dem ersten passiven Modus auf den zweiten Übungsmodus umgestellt wird, und in dem die Übungselemente (10,22,2332,) mit Widerstandselementen verbunden werden können, die so angelegt sind, dass sie eine einzige Widerstandsquelle (1-3) bieten, die wiederum verstellbar ist,(156) um den Widerstand, auf den der Benutzer bei den Übungselementen trifft, zu variieren, und in der die Widerstandquelle einen Set

von freien Gewichten beinhaltet, die zentral am Hinterteil der Rückenlehne angebracht sind.

2. Ein Übungsgerät, wie in Patentanspruch 1 beschrieben., bei dem die freien Gewichte (1) entlang faltbarer Standfiihrungselementen (4 Fig 2) bewegt werden können, deren Länge verringert werden kann, wenn der Stuhl vom Übungsmodus auf den passiven Modus umgestellt wird.

3. Ein Übungsgerät, wie oben in den Patentansprüchen beschrieben., bei dem die Rückenlehne (48) ein Paar von gegenüberliegenden Platten enthält, (50 Fig 3) die geöffnet werden können, um Zugang zu mehreren Übungselementen (10) zu geben, die sich eignen, um zusammen gegen eine einzige Widerstandsquelle zu arbeiten.

4. Ein Übungsgerät, wie in Patentanspruch 1 beschrieben., bei dem die Übungselemente über einen Butterfly-Mechanismus (10) verfügen, der ein Paar Butterfly-Arme (10 Fig 7) auf Arm- oder Ellbogenlehnenhöhe beinhaltet, die sich beide um einen festgestellten Drehpunkt (15 Fig 7) gegen den Bewegungswiderstand, der durch eine einzige Widerstandsquelle geboten wird, drehen. (1 Fig 2)

5. Ein Übungsgerät, wie in Patentanspruch 4 beschrieben., bei dem die Butterfly-Arme (10) ein konstantes Widerstandsmittel (11 Fig 7) beinhalten, das effektiv sicherstellt, dass der Bewegungswiderstand der Butterfly-Arme (10) im Wesentlichen während des gesamten Drückvorgangs beibehält.

6. Ein Übungsgerät, wie in allen vorangegangenen Patentansprüchen beschrieben., bei dem die Verbindungselemente an eine einzige Widerstandsquelle zur Benutzung als Brustdrückübung angeschlossen sind.(25 Fig 10)

7. Ein Übungs Rückenlehne (48) eine zentral angebrachte Stange beinhaltet, (33 Fig 2) die Ein ÜAnhängemittel für eine "High pull"-Übungselement aufweist, und einen Bewegungswiderstand hat, der von einer einzigen Widerstandsquelle stammt. (1 Fig 2)

8. Ein Übungsgerät, wie in allen vorangegangenen Patentansprüchen beschrieben., bei dem die Sitzfläche (47)eine exponierte Frontecke hat, an die ein bewegliches Übungselement (122/123 Fig 13)gegen eine einzige Widerstandquelle eingehakt wird, wobei das Übungselement so geformt ist, dass es Übungsregime bietet und ein Bogenelementteil (24 Fig 4)oder andere Elemente angebracht sind,(37 Fig 4) um eine Kraft nach unten zu richten, die einen Widerstand gegen die Bewegungen zweier oder mehrerer Muskelgruppen bieten.

9. Ein Übungsgerät, wie im Patentanspruch 8 beschrieben, in welchem das Übungselement in einer fixem, ausgefahrenen Position fixiert und an ein Tret-Kurbelgetriebe angefügt werden kann,(Fig 14) welches ein Paar Pedale hat, die über einen drehbaren Schaft (151 Fig 15) angeschlossen werden können, wobei der Widerstand zur Rotierung der Pedale über eine einstellbare Reibungsbuchse gegeben wird.(180 Fig 15)

10. Ein Übungsgerät, wie in Patentanspruch 2 beschrieben, das eine einzige Widerbestandsquelle aufweist, die aus einem Set freier Gewichte (1) besteht, welche an ihren äußeren Enden über Standführungselemente (4 Fig 2) verfügen, die ein leichtes Verstauen der Gewichte ermöglichen.

11. Ein Übungsgerät, wie in Patentanspruch 1 beschrieben, die widerstandsquelle kann aus einem oder mehreren Widerstandsträgern wie Federn, Spannbänder, einschließlich Gummiseile, hydraulische oder pneumatische Zylinder, einem Set freier Gewichte, elektromagnetische Widerstandsmittel oder dynamische. Reibungsmechanismen gewählt werden.

Revendications

1. Un appareil d'exercices telle une chaise, avec une partie pour s'asseoir (47) et un dossier (48) qui, dans un premier mode passif, cache une multitude d'éléments pour faire des exercices (10,22,23,32) qui, réunis, forment un appareil d'exercices, et qui, dans un deuxième mode d'exercice, révèle un ou plusieurs des éléments cités pour faire des exercices (10,22,23,32) pour un utilisateur dans lequel les éléments cités pour faire des exercices (10,22,23,32) sont liés à des éléments de résistance configurés de manière à comporter une source de résistance unique (1-3) qui est réglable pour varier la charge de l'exercice, trouvée par l'utilisateur dans les éléments cités pour faire des exercices, dans lesquels la source de résistance (1-3) comporte un lot de poids libres (1) **caractérisé par le fait que** la position de la partie pour s'asseoir est soulevée et bloquée (156) dans une position respectant la base quand l'appareil bouge entre le premier mode passif et le deuxième mode d'exercice, et **par le fait que** le lot de poids libres est disposé au centre à l'intérieur du dossier.

2. Un appareil d'exercices comme revendiqué dans la Revendication 1, dans lequel les poids libres (1) sont mobiles le long des éléments de guidage demeurant repliables (4 fig 2) qui peuvent se rétracter dans le sens de la hauteur quand l'appareil d'exercices est déplacé du mode exercice au mode passif.

3. Un appareil d'exercices comme revendiqué dans les revendications précédentes, dans lequel le dossier (48) comprend une paire de panneaux de côtés opposés (50 Fig 3) qui peuvent s'ouvrir pour permettre l'accès à une paire d'éléments pour faire des exercices (10) appropriée à agir ensemble contre une source de résistance unique.

4. Un appareil d'exercices comme revendiqué dans la Revendication 1, dans lequel les éléments pour faire des exercices possèdent un mécanisme 'papillon' (10) avec une paire d'accoudoirs en forme de papillon (10 Fig 7) au niveau du coude ou de l'appui de l'accoudoir en hauteur dont chacun gravite autour d'un pivot sécurisé (15 Fig 7) contre la résistance du mouvement assuré par la source unique de résistance citée (1 Fig 2).

5. Un appareil d'exercices comme revendiqué dans la Revendication 4, dans lequel chaque accoudoir en forme de papillon (10) comporte un moyen de résistance constant (11 Fig 7) efficace pour assurer la résistance du mouvement des accoudoirs en forme de papillon (10) et est substantiellement maintenu tout au long du mouvement.

6. Un appareil d'exercices comme revendiqué dans toutes les précédentes revendications, dans lequel les éléments de connexion sont attachés à une source de résistance unique pour l'utiliser comme un exercice pour les pectoraux (25 Fig 10).

7. Un appareil d'exercices comme revendiqué dans toutes les précédentes revendications, dans lequel le dossier (48) comporte un support central (33 Fig 2) avec des attaches pour un élément pour faire des exercices de 'haute traction' et ayant une résistance au mouvement assurée par la source de résistance unique citée (1 Fig 2).

8. Un appareil d'exercices comme revendiqué dans toutes les précédentes revendication, dans lequel la partie pour s'asseoir (47) comporte un rebord avant exposé auquel est attaché par des charnières un élément pour faire des exercices (122/123 Figl3) mobile contre une source de résistance unique, l'élément pour faire des exercices ayant cette forme pour assurer les régimes d'exercices et ayant une pièce de l'élément de l'arc (24 Fig 4) ou d'autres éléments attachés (37 Fig 4) pour assurer une force vers le bas qui résiste à un mouvement vers le haut pour deux ou davantage de groupes musculaires séparés.

9. Un appareil d'exercices comme revendiqué dans la Revendication 8, dans lequel l'élément pour faire des exercices est bien attaché dans une position tendue et auquel est attaché le mécanisme cyclique d'une manivelle (Fig 14) avec une paire de pédales liée via un manche rotatif (151 Fig 15). La résistance à la rotation des pédales étant assurée par un manche de frottement réglable (180 Fig 15).

10. Un appareil d'exercices comme dans la revendication 2 dans lequel la source de résistance unique comprend un lot de poids libres (1) où les éléments de guidage en position élévée (4 Fig 2) sont situés à côté des rebords externes des poids, permettant de retirer facilement les poids.

11. Un appareil d'exercices comme revendiqué dans la Revendication 1, dans lequel la source de résistance (1) est choisie parmi un ou plusieurs moyens de résistance, y compris les ressorts, les courroies de tension, les cordes en caoutchouc, les systèmes de pression hydrauliques ou pneumatiques, les cylindres, un lot de poids libres, des moyens de résistance électromagnétiques ou des mécanismes de frottement dynamiques.

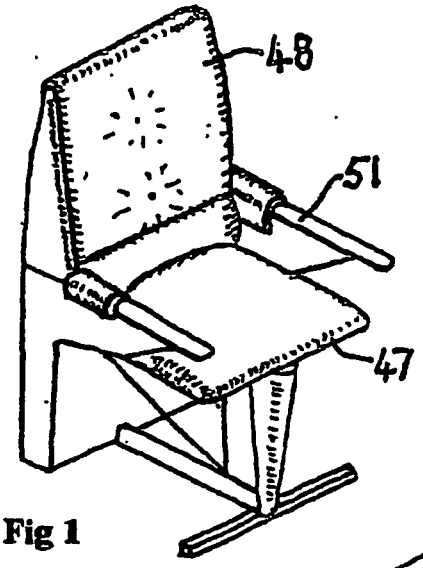


Fig 1

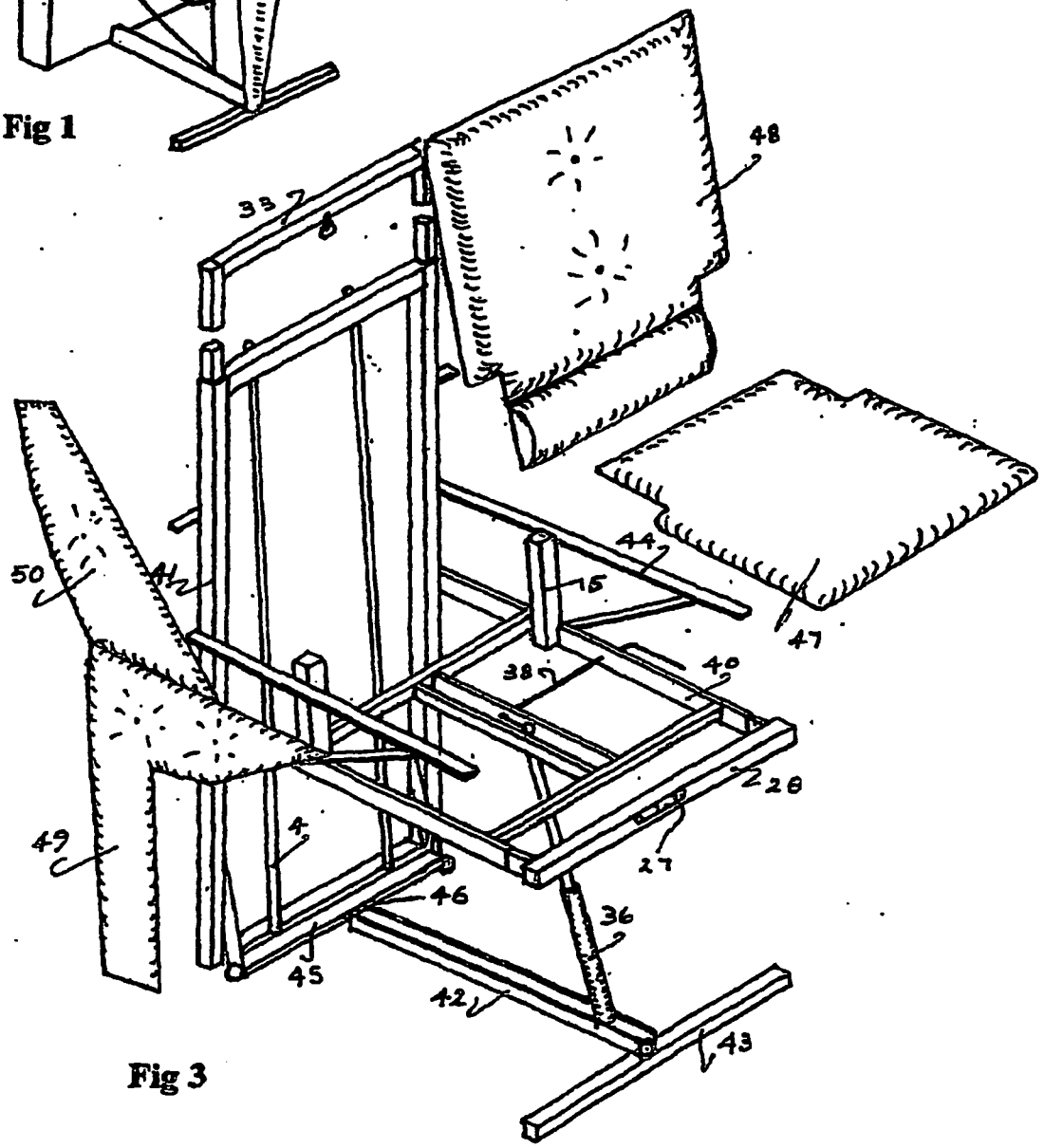


Fig 3

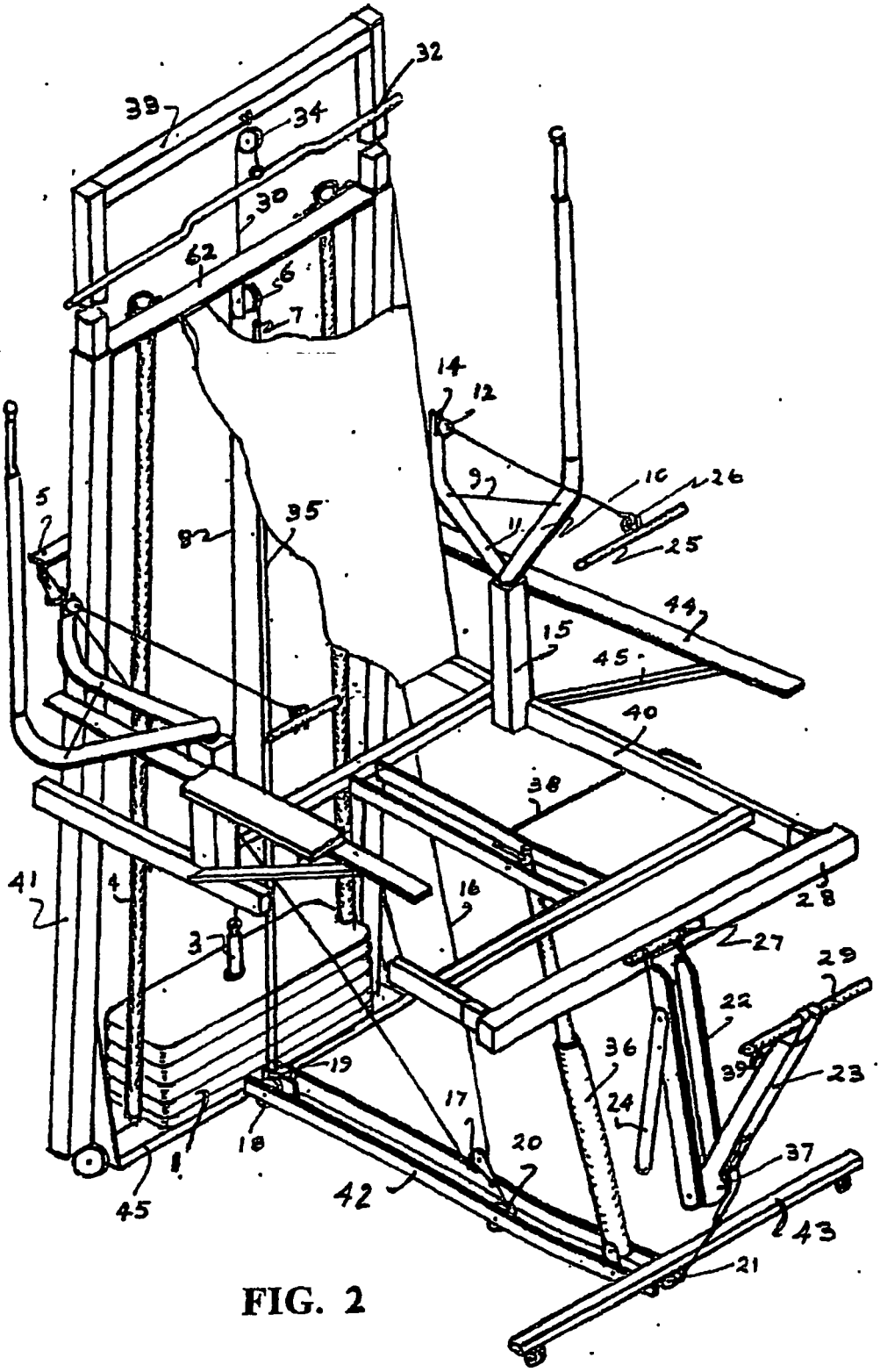

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FIG. 2

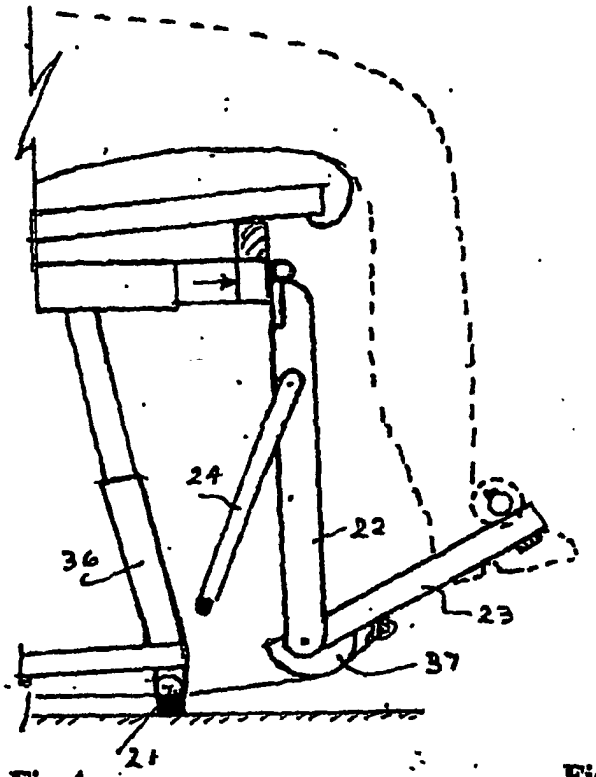


Fig 4

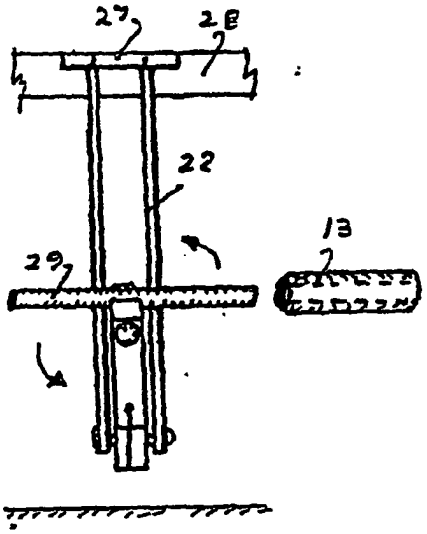


Fig 5

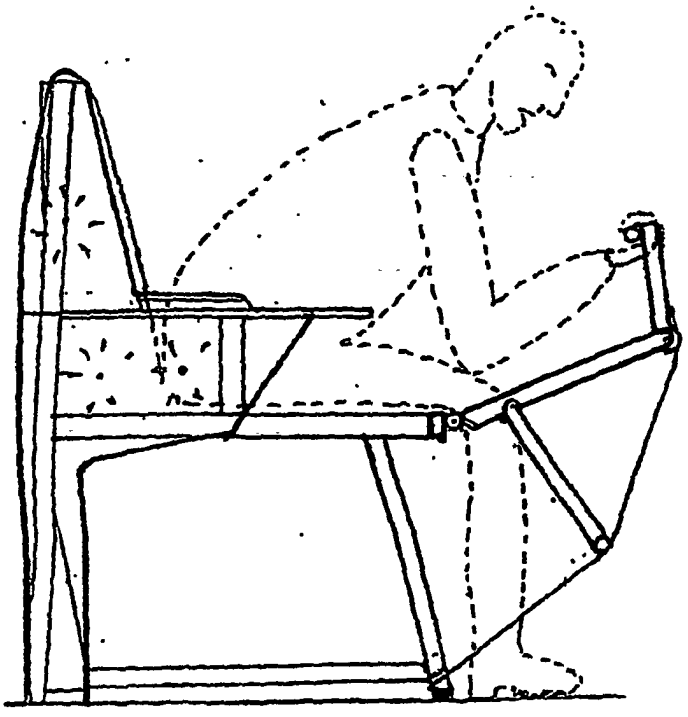


Fig 6

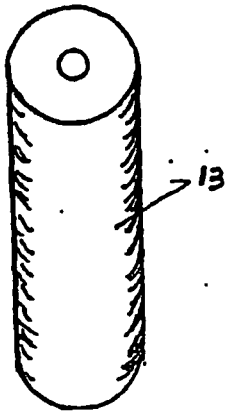


Fig 8

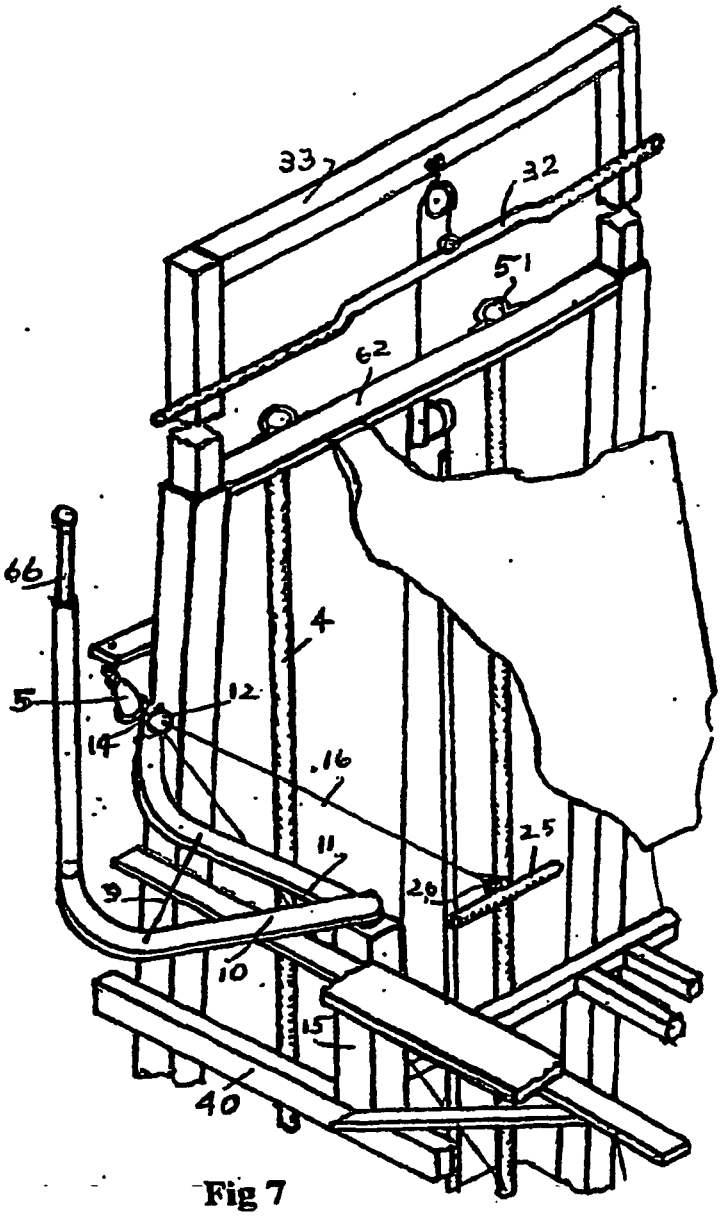


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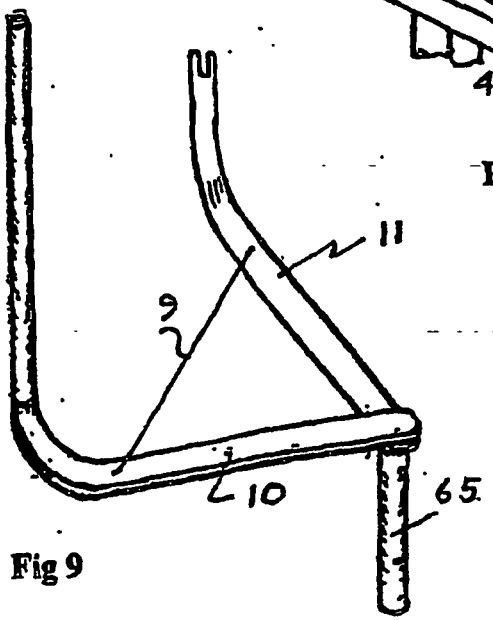


Fig 9

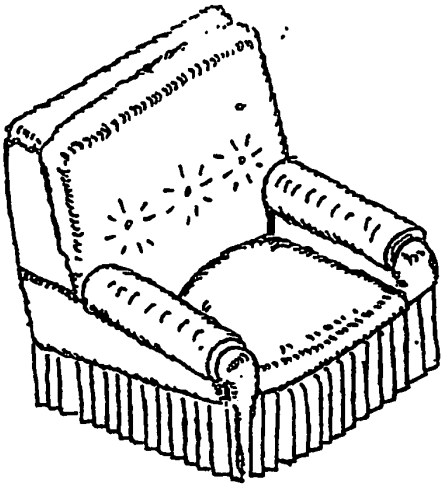


Fig 11

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Fig 10

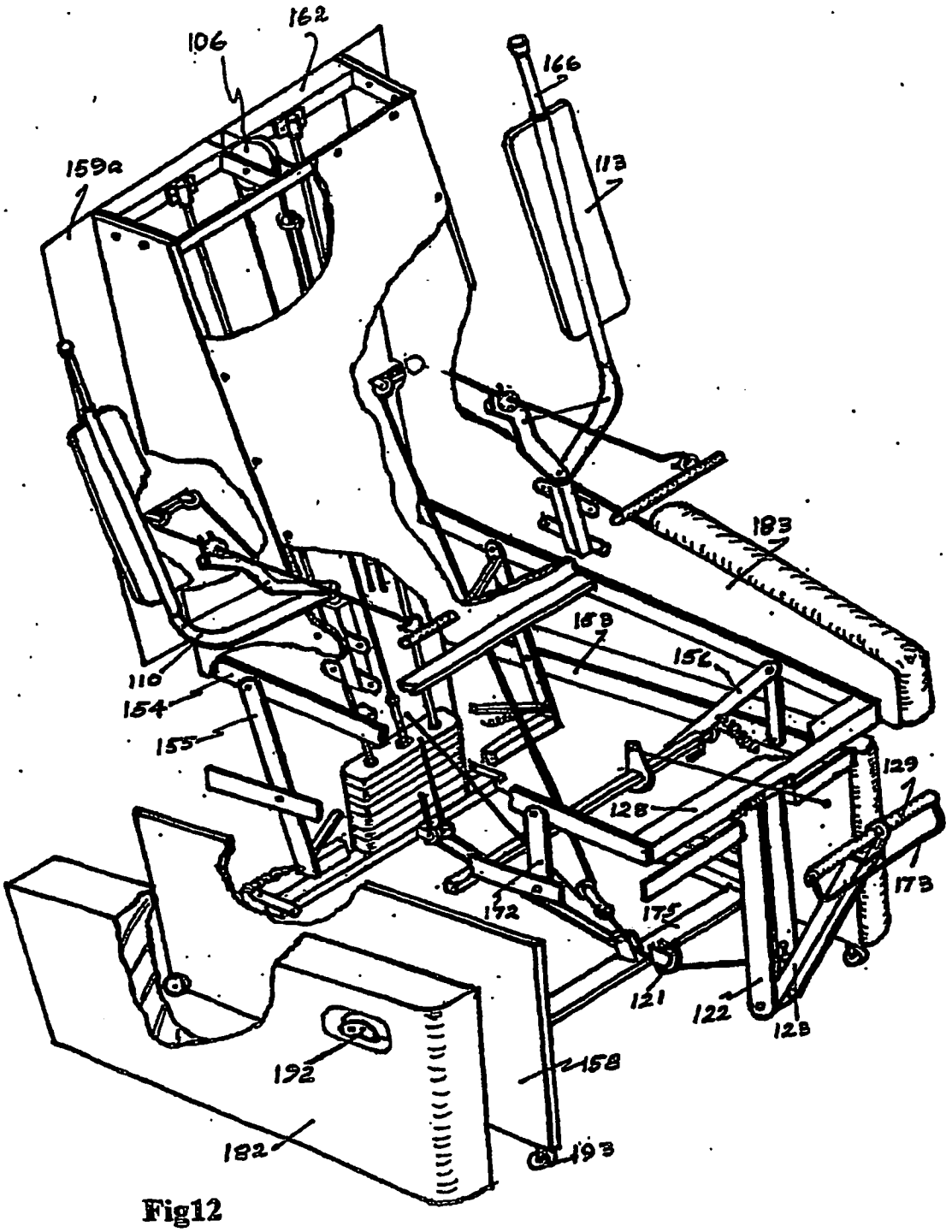

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Fig12

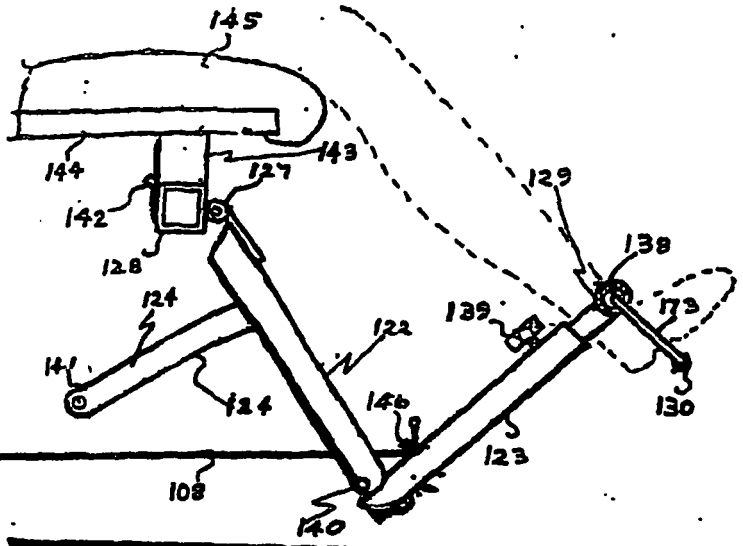


Fig 13

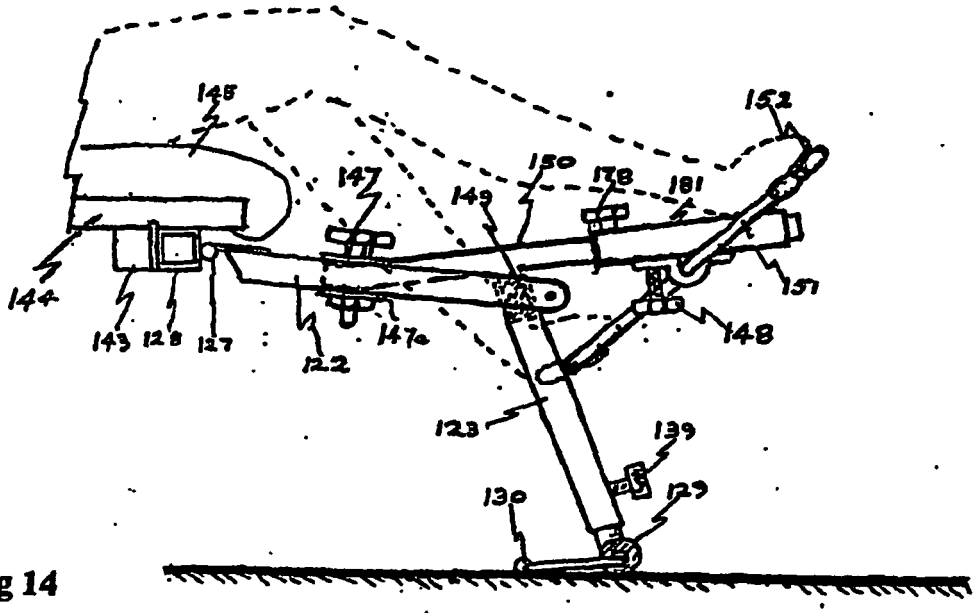


Fig 14

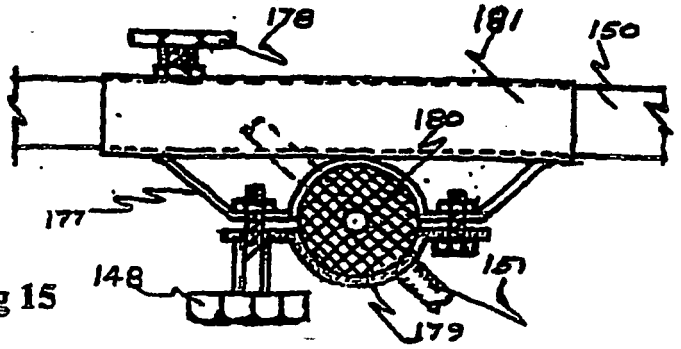


Fig 15

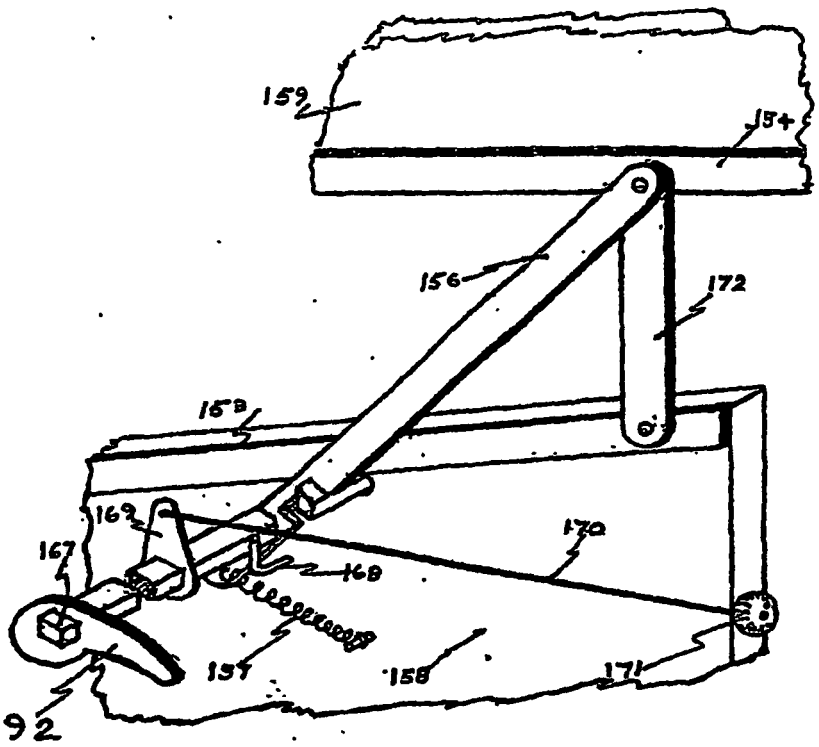

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Fig 16

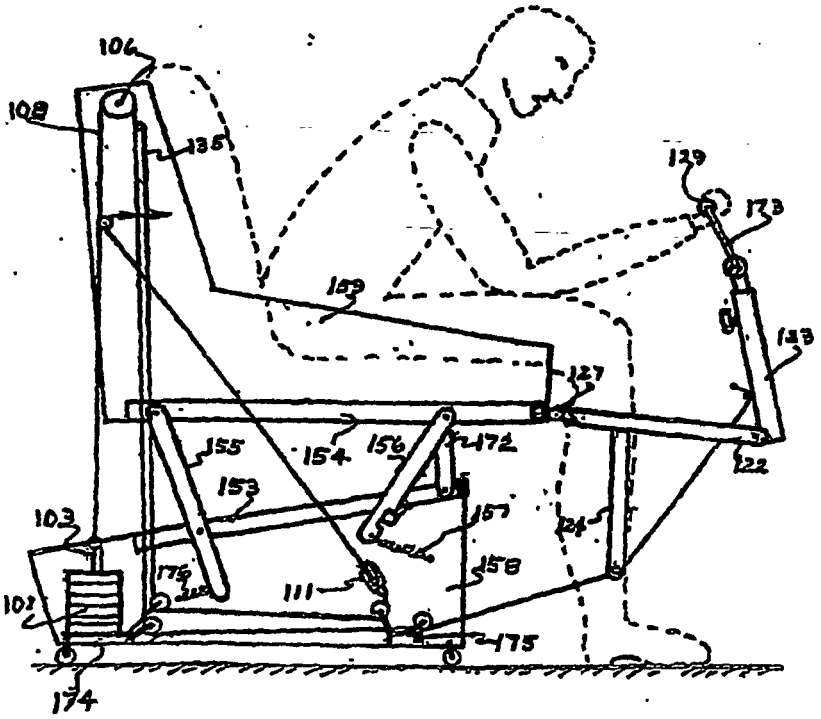

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Fig 17

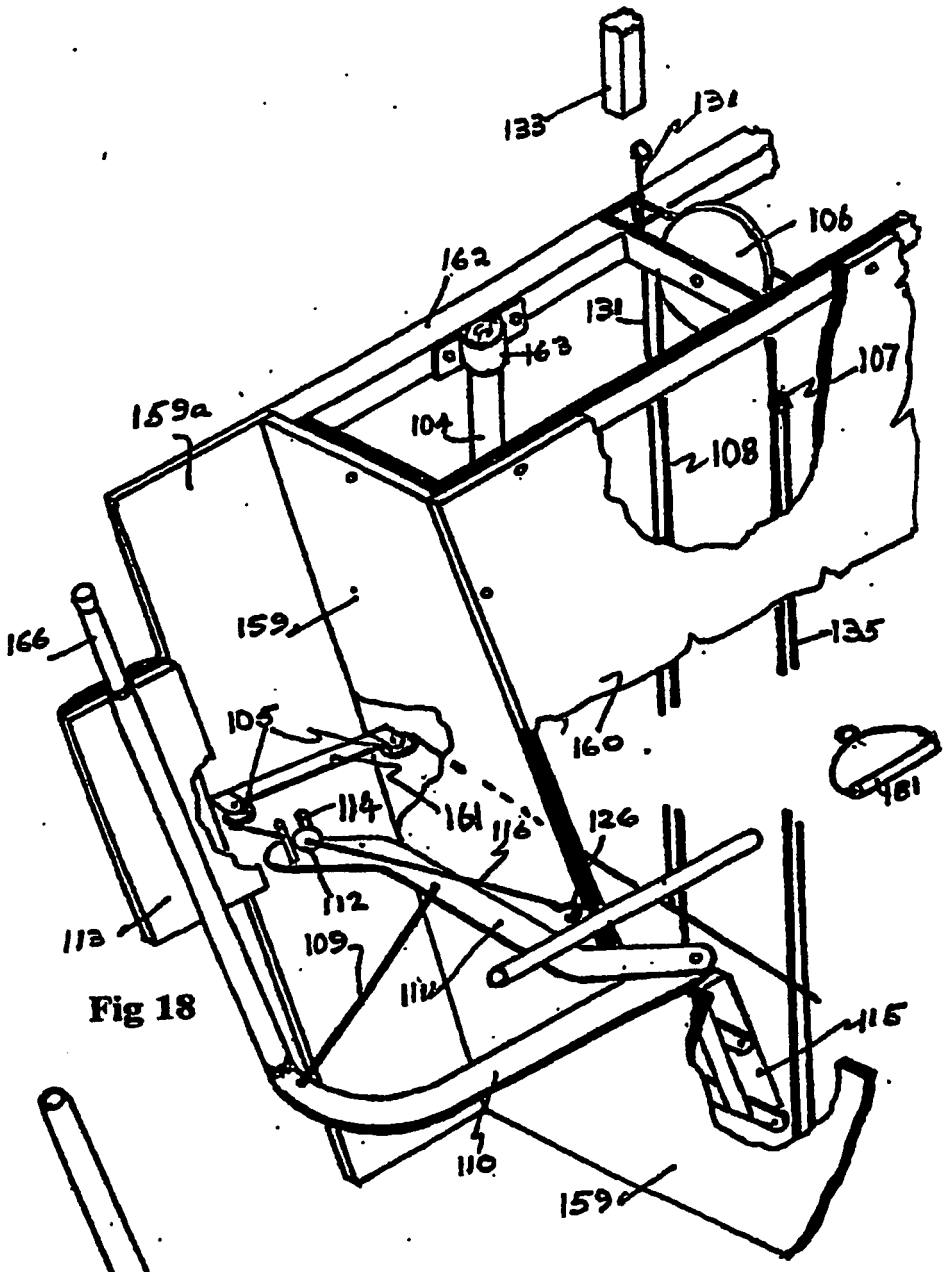

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Fig 18

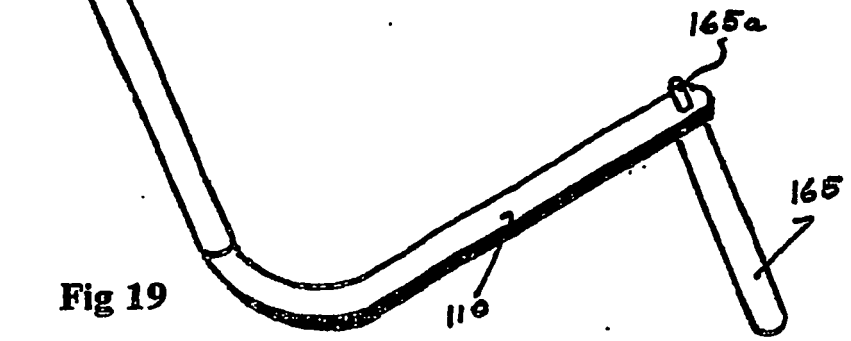

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Fig 19

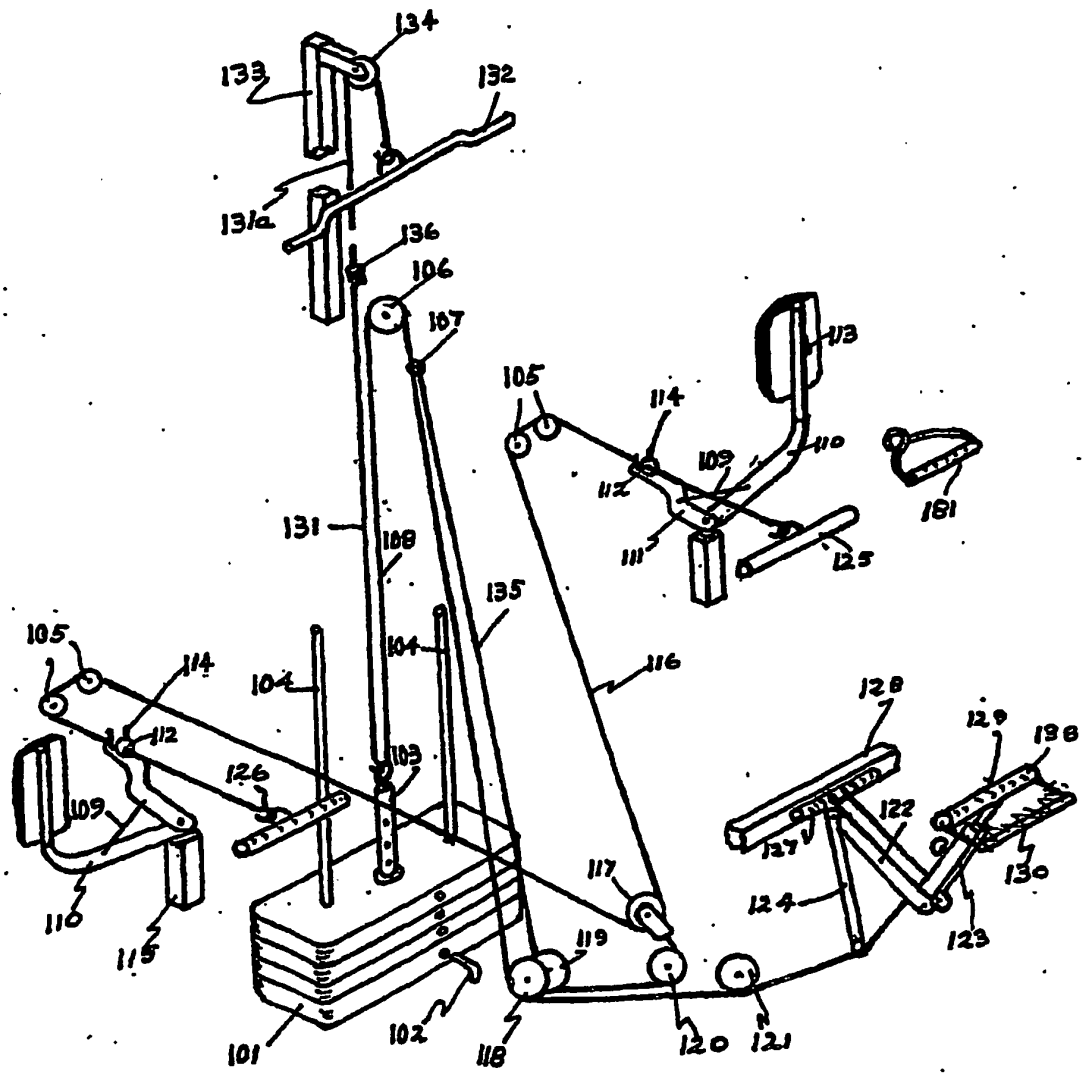

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Fig 20

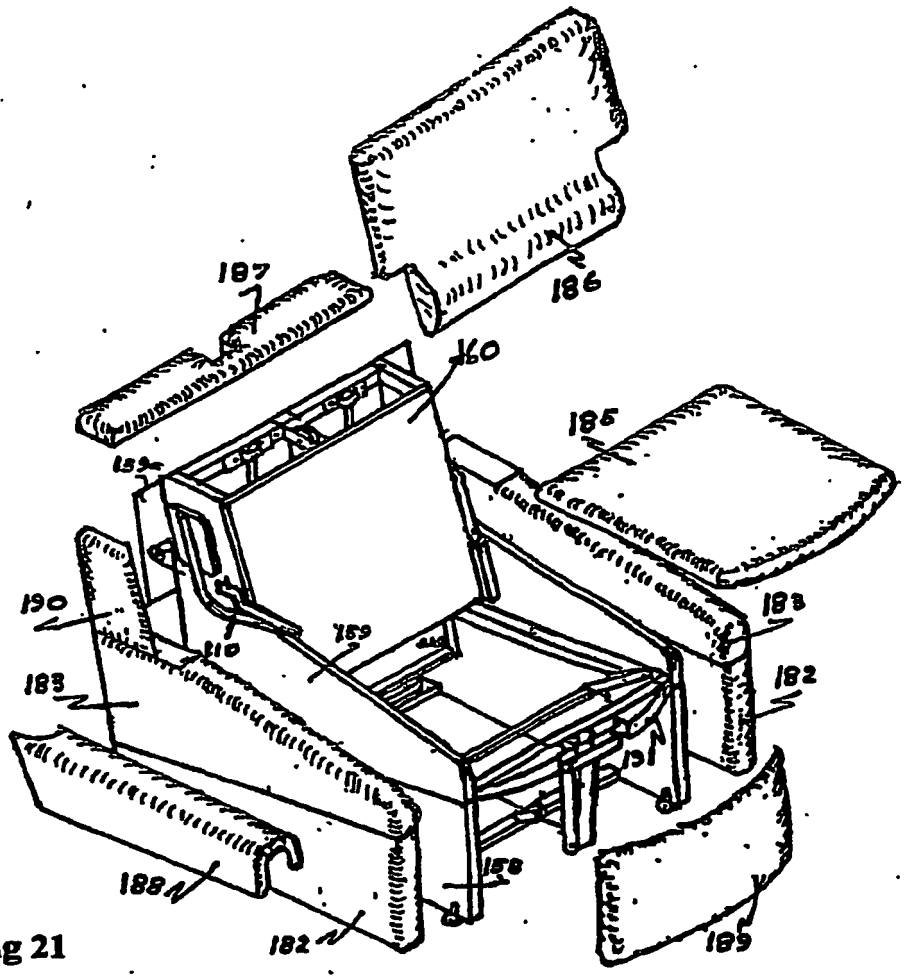

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Fig 21

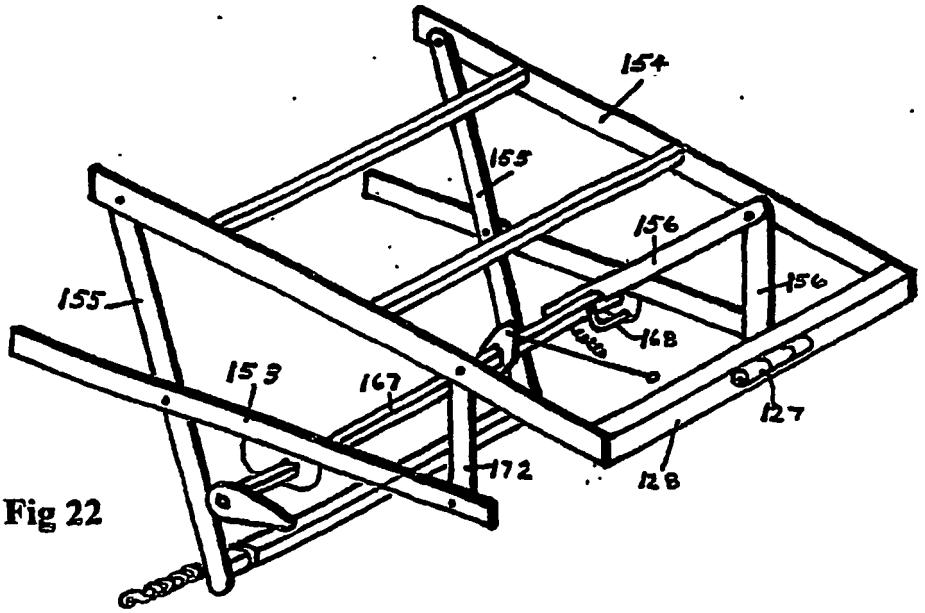

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Fig 22

REFERENCES CITED IN THE DESCRIPTION

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