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

(11) Publication number: **0 116 371**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **84101513.4**

(22) Date of filing: **14.02.84**

(51) Int. Cl.³: **A 61 H 1/02**
//A63B17/00

(30) Priority: **15.02.83 US 466540**

(43) Date of publication of application:
22.08.84 Bulletin 84/34

(84) Designated Contracting States:
CH DE FR GB LI

(71) Applicant: **Oetiker, Hans**
Oberdorfstrasse 21
CH-8810 Horgen(CH)

(72) Inventor: **Oetiker, Hans**
Oberdorfstrasse 21
CH-8810 Horgen(CH)

(74) Representative: **Riebling, Günter, Dr. Ing. et al,**
Rennerle 10 Postfach 3160
D-8990 Lindau(DE)

(54) Fitness therapy apparatus.

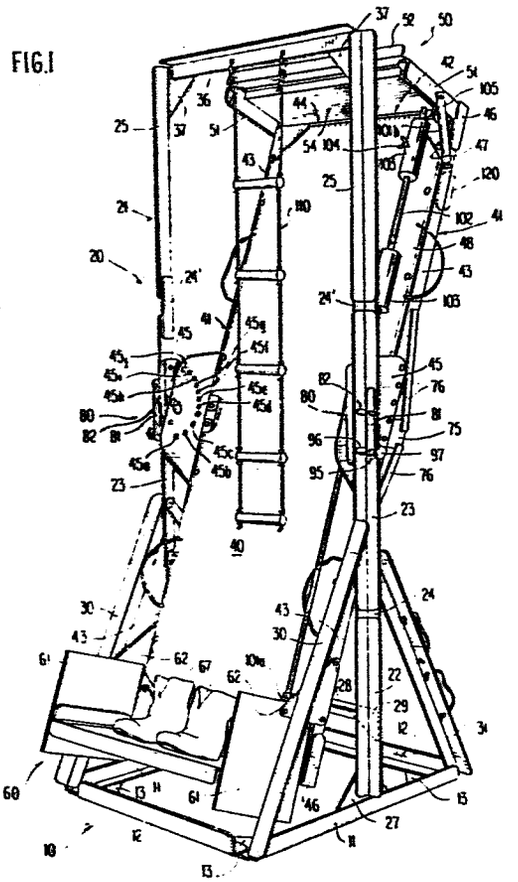
(57) A fitness apparatus for inversion therapy in which the frame structure includes a base frame and an upright with two spaced upright frame members interconnected near the ends thereof by transverse frame members; a bed-like support assembly of such width that ist will fit between the upright frame members is pivotally connected to the latter; the bed-like support assembly includes holding means near the lower end thereof of releasably hold the legs of the person sing the apparatus in fixed position with respect to the bed-like support assembly; the bed-like support assembly additionally includes balancing means to enable pivotal movement of the bed-like support assembly controlled by simple arm movements of the person held onto the same by the holding means; the various parts of the frame structure and of the bed-like support assembly may thereby be made of standard frame parts detachably interconnected by bolts and slide members; a plate is secured to each side of the bed-like support assembly within the center area thereof, which is provided with a predetermined number of holes lying on a circle about the pivot axis of the bed-like support assembly on the upright frame to permit the bed-like support assembly to be held relative to the upright frame in a predetermined angular position by engagement of a pin-like member in a predetermined one of the apertures.

EP 0 116 371 A2

./...

Croydon Printing Company Ltd.

FIG.1



FITNESS THERAPY APPARATUS

The present invention relates to a fitness apparatus for inversion therapy by a person adapted to be suspended thereform in the head's-down psition.

The therapeutic values of inverted suspension for persons has received medical recognition to an ever-increasing extent. Apart from improved blood circulation, particulary into the brain, such inversion therapy has also proved helpful in many instances with back problems in the spine, and in particular with disks.

Various prior art prosposals exist to implement in practice the benefits optainable form inversion therapy. However, these prior art equipments entail certain disadvantages which limit their usefulness. More particulary, they are either too complicated and therewith too costly or too simplistic and therewith inadequately versatile in use. Additionally, some of the prior art apparatus overemphasize light-weight and portability at the expense of sturdiness and safety when used at home without an attendant. Finally, none of the prior art apparatus commercially available at present permit shipment in knocked-down conditions, easy assembly and installation as well as easy disassembly, when needed, without sacrifice in sturdiness and therewith safety and without loss of versatility in use, not to mention ready adaptability to height and weight of the user, permitting fine adjustments by the person when already secured to the apparatus.

Moreover, the use of ordinary boots to secure the person to the apparatus not only assures great safety, but also comfort and convenience in use.

In one very simple prior art arrangement, the feet of a person to be suspended in inverted position are strapped to a raised horizontal bar by means of hooks. While such an arrangement will permit the entire body so stretch, when suspended, such prior art arrangement entails the disadvantage of being limited to a single inverted position, not to mention the fact that it requires an attendant. The use of ankle supporting devices each consisting of two jaw members hingedly connected together and suspended from a bar by hooks (U.S. Patent 3,380,447) does not eliminate the shortcomings of such an arrangement. Another prior art fitness apparatus of the type described above consits of a contoured seat and inversion bar assembly mounted on a small, light-weight frame formed only of two inverted, cross-connected V-shaped frame members with the seat pivotally connected thereto within the area of the V-neck. While this prior art apparatus is extremely simple in construction, it lacks any structural features necessary to give it substantial versatility in use by adaptation to the user's weight an height, not to mention the rigidity and strenghth in the frame structure desirable to assure a high degree of safety. Moreover, ankle boots to be hooked to the inversion bar used to secure the user to the apparatus which, by reason of the non-permanent connection, represents a source of possible unitentional disconnection, apart from considerations of convenience an comfort during use.

Still another prior art fitnexx apparatus for inversion therapy utilizes a flat support with a foot bar again pivotally mounted within the area of the V-neck of the two inverted, cross-connected V-shaped frame members. In this prior art apparatus, the person is strapped to the appartus by insteplocks which are secured by an attendant. The apparatus ist also constructed of light-weight steel an aluminium for easy portability. While this prior art apparatus provides some adjustability to height and weight of the user, it still entails the disadvantages mentioned hereinabove.

The apparatus described in U.S. Patens 3,707,285 and 7,716,231 are also representative of prior art arrangements which entail shortcomings similar to those described hereinabove.

An automated therapy apparatus ist also known, in which a bed like support is pivotal relative to a frame, driven by an electronically controlled motor to permit the user to assume various inclined positions. The principal drawback of this apparatus resides in lack of simplicity and in its very high initials costs as well as in subsequent costs of maintenance due to its relative complexity. Accordingly, it is a principal object of the present invention to provide a fitness apparatus of the type described above which is simple in construction, easy to assemble, involves relatively low costs and offers great versatility in use, whereby the inclined position of the person using the same can be selectively established by simple arm movements of such person, once the apparatus has been adjusted for height and weight.

The underlying problems are solved according to the present invention in that a bed-like support structure is pivotally connected with respect to upright members of a sturdy frame structure and in that readily adjustable means including balancing means on the bed-like support structure itself are provided to compensate for changes in height and/or weight of the person so as to enable control of the pivotal movements and/or selection of the inclined position of the bed-like support structure by simple arm movements of the person secured thereto. The adjustable means conists thereby preferably of a first means permitting step-wise adjustment and of a second means permitting fine continuos adjustment. The first means thereby enables adjustment of the bottom support structure in the lengthwise direction of the bed-like support assembly while the second adjustable means enables fine compensation for weight differences and/or weight distribution differences and, in one preferred embodiment, is in the form of weights movable on a rod secured to the bed-like support assembly and adapted to be fixed in any desired position as determined by the person when already secured to the bed-like support structure. However, according to another embodiment, the second adjustable means may consist of different weights adapted to be selectively connected to the sides of the bed-like support assembly to assure a very fine adjustment.

According to another feature of the present invention, the means holding the person onto the bed-like support structure are in the form of ordinary boots securely mounted on a plate-like support member forming part of the bottom support structure, whereby the plate-like member can be readily interchanged to accommodate different shoe sizes of the person using the apparatus.

By the use of laced boots, instead of straps or the like, a completely safe and convenient suspension of the person is assured by means familiar to and adapted to be readily tightened by the person using the same without the danger of local pressures of discomforts. However, the same advantages are obtainable if instead of laced boots, padded ankle supports fixedly mounted on the bottom support structure àre used with conist each of two parts hingedly connected with each other and adapted to be securely latched together, so that the need for different boot sizes is obviated.

According to a still further feature of the present invention, the fitness apparatus in accordance with the present invention is assembled of standard parts, presently available commercially under the designation of "Oetiker" framing system. This not only assures relatively low costs in manufacture and shipping in knocked-down condition, but additionally assures relatively low costs in subsequent assembly of the equipment by the user.

According to a still further feature of the present invention, simple manually selectively engageable means are provided on the apparatus to hold the bed-like support structure in any one of a number of predetermined positions, whereby in the horizontal position the bed-like structure can be used as a spare bed.

These and other objects, features and advantages of the present invention will become more apparent from the following description when taken in connection with the accompanying drawing which shows, for purposes of illustration only, two embodiments in accordance with the present invention, and wherein:

Figure 1 is a perspective view of an inversion therapy apparaturs in accordance with the present invention;

Figure 2 ist a partial perspective view from the top and slightly to the rear of the lower frame assembly of the apparatus of Figure 1;

Figure 3 is a partial perspective view from the rear on the upper frame and bed-like support assembly of Figure 1;

Figure 4 is a partial perspective view from the side and from above on the lower frame and bed-like support assembly of Figure 1;

Figure 5 is a partial perspective view from the side and from below on the lower area of the lower support structure of the bed-like support assembly, also illustrating the arrangement enabling selective adjustment thereof in the height direction;

Figure 6 is a schematic side view of the apparatus in accordance with the present invention, schematically illustrating its use;

Figure 7 is a partial perspective view from in front and the side of a modified embodiment of an apparatus in accordance with the present invention utilizing ankle supports;

Figure 8 is an elevational view illustrating an ankle support of the present invention in the partially opened condition; and

Figure 9 is a schematic view of a modified embodiment of an apparatus in accordance with the present invention.

Referring now to the drawing wherein like reference numerals are used throughout the various views to designate like parts, the fitness therapy apparatus in accordance with the present invention includes a base frame structure generally designated by reference numeral 10 which conists of two longitudinal angle bars 11 and two transverse angle bars 12 interconnected by four corner plates 13 with the use of bolts and slider members, as more fully disclosed in my prior U.S. Patent No. 3,769,772. Mounted on the base frame structure 10 is an upright frame structure generally designated by reference numeral 20 which includes two upright frame members generally designated by reference numeral 21. In order to permit use of standard length angle bars, the upright frame members are each composed of three angle bars 22,23 and 25 interconnected by shorter angle bar extension elements 24 and 24', whereby the extension element 24 may be fixedly connected to angle bar 22 ba rivets and the angle bar extension 24' may be fixedly connected with the angle bar 25 by rivets. For purposes of connecting the upright frame members 21 to the base fram 10, a corner plate 27 ist fastened to each longitudinal angle bar 11 while each angle bar 22 is secured to the corresponding corner plate 27. The interconnection between standard frame parts in the apparatus according to the present invention will be by the use of bolts and slider members unless otherwise indicated.

A tranverse frame member 28 in the form of a standard angle bar is connected to the angle bars 22 by way of corner plates 29 within the lower area of the upright frame members 21. To lend additional rigidity

to the frame structure, trussing frame members 30 und 31 in the form of angle bars are connected to the ends of a respective base frame member 22 and the angle bar 23. To compensate for different lengths and requirements, a short flat extension bar (not shown) is thereby riveted to the angle bar 31 by rivets which at the same time compensates for the thickness of an angle bar so that the angle bars 30 can be connected on the outside and the angle bars 31 on the inside of the angle bars 23.

Stop plates 33 (Figure 2) which are specially made for purposes of the equipment of the present invention are secured to the cross frame member 28 by bolts and slide members. The stop plates 33 are thereby provided with approximately V-shaped notches 34 to receive corresponding angle bars of the bed-like support assembly generally designated by reference numeral 40, to be described more fully hereinafter, so as to stop the latter in the normal non-inverted position.

A transverse frame member 36 in the form of a standard angle bar is connected to the upright angle bars 25 by means of corner plates 37.

The bed-like support assembly generally designated by reference numeral 40 is formed by two longitudinal frame-like members generally designated by reference numeral 41 and two transverse frame-like members generally designated by reference numeral 42. The longitudinal frame-like members 41 are thereby formed on each side by two angle bars 43 interconnected with each other by an apertured plate member 45 and connected with transverse angle bars 44 by means of the four flat corner connectors 46 and corner plates 47. The bed-like support assembly 40 is additionally provided with a headboard structure generally

designated by reference numeral 50 which consists of two shorter angle bars 51 connected to the corner connectors 46 and a transverse angle bar 52 interconnecting the free ends of the angle bars 51. A headboard 53 (Figure 3) made, for example, of plywood or plastic material is detachably secured in four places to the top surfaces of the angle bars 52. The headboard 53 is provided with appropriate padding 54 on the side facing the opposite end of the bed-like support structure as additional safety feature to prevent injury to the head of the person using the equipment of the present invention in the unlikely event that the feet of the user may slip out of the holding means provided therefor.

The bottom support structure generally designated by reference numeral 60 includes two rectangular plates 61 which may have rounded- off corners and are secured to the corresponding transverse angle bars 43 by corner plates 62. Additionally, the plates 61 are secured to the corner connectors 46 by way of short angle bars 63 detachably secured to both plate members 61 and corner connector 46. The bottom support structure 60 also includes a subframe (Figure 5) consisting of two shorter angle bars 64 interconnected by two transverse angle bars 65, whereby the angle bars 64 are detachably secured to the plate member 61 in any one of a number of holes, for example, five holes 61' to permit a step-wise adjustment of the bottom support structure in the lengthwise direction of the bed-like assembly 40. To further increase the safety of the selected position of the bottom support structure, spring-loaded bolts 69 are used for connecting the angle bars 64 to the plate members 61 whereby the sliders 70 used for holding the spring-loaded bolts in position are interconnected by links 71 riveted to the slider members 70.

The holding means for holding the person on the bed-like support structure consists in the embodiment illustrated in Figures 1-5 of a pair of boots 67 suitably bolted to a plate member 66 made, for example, of steel which is detachably connected on four places to the transverse angle bars 65. Step-off plates 68 made of wood or plastic material are provided on each side of the plate member 66 which are again detachably connected to the transverse angle bars 65.

Integral with each plate member 45, for example, by the use of rivets, is a bracket 75 which serves two purposes. On the one hand, the trussing links 76 are detachably connected between a bracket 75 and the longitudinal frame-like members 41. On the other hand, a reinforcing bar (not shown) which serves as fixed shaft about which the bed-like assembly can be folded together, is welded to the bracket 75. The bracket 75 may thereby be in the form of an inwardly open U-shaped housing with appropriate gusset-like reinforcements supporting the reinforcing bar onto the bracket 75.

The pivotal connection generally designated by reference numeral 80 of the bed-like assembly on the frame structure includes a short angle bar 81 secured to the angle bar 23 of the upright frame member 21. for example, by four rivets. A pivot pin 82 thereby extends through corresponding openings in angle bar 23 and in angle bar 81 as well as through an opening in a nylon bearing block (not shown) interposed between parallel surfaces of the angle bar 23 and the apertured plate member 45, whereby all these openings are so provided as to be properly aligned. A cotter pin (not shown) as well as a spring clip (not shown) hold the pivot pin 82 in the assembled position, utilizing washers (not shown) in connection with the cotter pin and the spring clip.

A manually selectively engageable member generally designated by reference numeral 95 includes a shank portion 96 and a contoured knob portion 97 with a cylindrical stop member (not shown) made, for example, of nylon and fixed to the shank portion 96 by a cotter pin (not shown) to limit axial movement of the selectively engageable member. The selectively engageable member 95 is thereby adapted to engange in any one of bores 45a through 45j provided in apertures plate members 45 whereby the bores 45a through 45j are arranged with their axex on a circle about the pivot axis of the bed-like support assembly. Starting with the bore 45d, the apertures are spaced more closely to permit the selection of more closely spaced positions as the bed-like support assembly proceeds from a horizontal position 46d into an inverted position.

The bed-like support assembly 40 is provided with a cover made of mesh-like nylon fabric 48 which is secured onto the longitudinal and transverse frame-like members 41 and 42 by the use of aperturd flat standard bars, about which the ends of the fabric are folded, and by the use of bolts and slide members which engage through aligned holes in the fabric, in the flat bars and i-corresponding frame-like members 41 and 42 in such a manner that the top fo the bolts are covered by the fabric.

The continuous fine adjustment for balancing the bed-like support assembly 40 includes two angle brackets 101a and 101b, one secured to a lower corner plate 62 and the other to the upper angle bar 51. A rod 102 which may be made of two or three sections is securely mounted at its two ends on the angle brackets 101. Two balancing weights 103 are slidably mounted on the rod 102 and can be secured in any selected position by the use of the

wing nuts 104. A reinforcing link 105 is thereby used between the angle bar 43 and the angle bar 51. To prevent injury to the person using the apparatus in case a weight 103 should become loose inadvertently, safety members in the form of plastic spacers tapered at each and of smaller diameter are provided on the rod 102 to each side of the weights.

Additionally, a ladder generally designated by reference numeral 110 consisting appropriately of several rungs mounted on two parallel ropes is secured to the transverse frame member 36 to serve as auxiliary means for the user of the apparatus to pull himself up from the inverted position in the event the bed-like support structure has not been carefully balanced.

O P E R A T I O N

In operation, the bed-like support assembly is preferably fixed in the normal, upright position by engagement of the selectively engageable members 95 in bores 45a. The person seeking to use the equipment will then step into the boots 67 which are securely laced with the bed-like support assembly in the normal position shown in full lines in Figure 6. The selectively engageable members 95 are the retracted on both sides to permit the person using the equipment to gradually pivot the bed-like support assembly 40 into an inverted position. This is easily achieved by first raising one arm into a position at right angle to the bed-like support structure, then lifting the other arm into a similar position which, with proper adjustment of the balancing weights 103, will cause the bed-like support structure to pivot into the approximate horizontal position shown in dash lines in Figure 6. Movement of the arm through another 90° will cause the bed-like support structure to tilt further with maximum inversion

of the bed-like support structure achieved when both arms are extended above the head of the person using the equipment, as shown in dash and dotted lines in Figure 6. In this position, the person then can hold onto the trussing frame 31 while engaging the engageable member 95 in the bore 45j, if he so desires. To return to a less inverted position or normal position, it ins only necessary for the person to rotate the arms back so that they extend normally in the direction toward the feed which will cause the bed-like support structure to pivot back toward the normal position. If necessary, the person may also utilize the ladder 110 to pull himself up into the upright position.

Adjustment of the apparatus to the given size and weight of the user is simple. A stepwise adjustment is possible by raising or lowering the bottom support structure which can be achieved by merely removing the sliders 70, removing the spring-loaded bolts 69 and remounting the angle bars 64 in the appropriate ones of the holes in plate member 61. A fine adjustment ist possible by the use of the balancing weights 103 which can be secured in any desired position on the rod 102 by the use of the wing nuts 104.

In lieu of the balancing arrangement described hereinabove and consisting of the parts 101a, 101b, 102, 103, 104 and 105, a very fine adjustment may also be realized by the use of weights 120 (Figure 1) in the form of flat standard frame members of varying thickness and apertured like the standard frame members which can be readily secured onto the angle bars 43 in any of the standard apertures by the use of bolts and slide members.

Figure 7 illustrates a modified embodiment according to the present invention, in lieu of the boots 67, a pair of ankle supports generally designated by reference numeral 200 are fixedly mounted on the plate 66. To that end, each ankle support 200 which consists of two shell parts 201 and 202 provided with thick padding 203 and hingedly connected with each other at 204, is rigidly secured onto the plate 66 by sturdy bracket-like members 205, whereby the upper end of each of the two bracket-like members 205 of a respective ankle support ist supported on a pivot member 206 extending laterally through the rear shell 201 on the two sides thereof. A second pivot pin 207 cooperates with a notch 208 in the other shell part 202 to guide the two parts relative to each other into the closed condition. A buckle-type closure mechanism of any known construction, such as used, for instance, with ski boots and generally designated by reference numeral 210 is adapted to lock the two parts 201 in the closed condition. The lower end of each bracket-like member 205 ist thereby securely connected to plate 66 in any known manner, preferably in a detachable manner to permit ready exchange of the ankle supports. As to the rest, the apparatus is the same as described hereinabove.

Additional safety measures may be readily incorporated in the apparatus of the present invention which is intended also for home use. More specifically, in the unlikely event the user of the equipment should black out while in the inverted position, the following modifications will assure the return of the bed-like support structure into its horizontal position to assist the user to speedily and safely regain consciousness.

A guide structure in the form of a cable or strong rope 300 fastened at both ends to the fixed frame structure extends from the center of the transverse frame member 36 ober the center of the headboard 53 to another fastening point in the center of the transverse frame member 28 by way, for example, of two rollers mounted in the center and on the outside of the headvoard 53 to avoid drag of the cable or rope on any part of the apparatus (Figure 9). The bottom support structure 60 and the weights 103 may then be adjusted to achieve approximate balance, as explained above, whereupon the bottom support structure and/or weights are further so adjusted that the system will always automatically return to the normal non-inverted starting position. This adjusted position of the system will permit the user to reach and stay in the inverted position by merely pulling on the rope and holding onto the same, which requires a minimum amount of force due to the nearly belanced condition of the system. Should the user black out and release the rope, the bed-like support structure would then automatically seek to return to the non-inverted starting position. Moreover, to prevent the bed-like support structure from returning completely to its non-inverted starting position, hooks or the like which are secured to the longidudinal frame-like member 41 at a certain distance below the pivot axis thereof by suitable members, such as short cables 310, ropes or the like, are adapted to be engaged by the user in corresponding apertures procided in the upright frame members 21 as the user proceeds from the starting position trough the horizontal position into the inverted position.

If so engaged, the bed-like support structure will be stopped in the horizontal position during its return movement from the inverted toward the non-inverted position, once the short cables assume a position corresponding to the hypotenuse of a triangle whose other sides are formed by the corresponding portions of the upright frame member 21 and the longetudinal frame-like members 41.

As a further safety feature, the bed-like support structure may also be equipped with a belt-like member fastened to the longitudinal frame-like members 41 and extending over the waistline of the user to prevent the user from falling forward if, for example, due to the failure on the part of the user to engage the hooks as described above, the bed-like support structure should return to its normal, fully non-inverted position after the user has blacked out. The belt-like member can be secured thereby in any conventional manner. Moreover, the location of the belt-like ist readily adjustable by the use of the apertures already provided in the longitudinal frame members of the bed-like support structure. Since these safety features can be readily added to the apparatus shown and describend hereinabove, a detailed showing thereof is dispensed with herein for the sake of simplicity.

The apparatus in accordance with the present invention is thus not only simple to assemble but is also extremely safe and simpel in use without requiring complicated controls. Additionally, it can be readily adapted to the height and weight of the person using the same, thereby offering great versatility.

While I have shown and described only two embodiments in accordance with the present invention, it is understood that the same is not limited thereto, but is susceptible of numerous changes and modifications as known to those skilled in the art. For example, though an assembly from standard frame parts is preferred, the apparatus can also be made and preassembled in the factory from parts specially designed and machined for the purpose of the equipment.Hence, I do not wish to be limited to the details shown and described herein, but intend to cover all such changes and modifications as are encompassed by the scope of the appended claims.

CLAIMS

1. A fitness apparatus for inversion thereapy, comprising a frame structure including base frame means having two spaced longitudinal frame members interconnected by cross frame members, upright frame means including two spaced upright frame members interconnected near the free ends thereof by transverse frame means to said base frame means in such a manner that said upright frame members are securely fastened to said base frame means in the upright position thereof, a bed-like support means of such width that said bed-like support means will fit between said upright frame members, pivotal connecting means pivotally supporting said bed-like support means in its center area on said upright frame means to enable pivotal movement of said bed-like support means relative to said upright frame members from an upright position of said bed-like support means toward an inverted position, holding means on said bed-like support means near the lower end thereof, when the bed-like support means is in its upright position, to releasably hold the person's legs in a fixed position with respect to said bed-like supports means, and adjustable means including balancing means on said bed-like support means to enable pivotal movement of the bed-like support means controlled by simple arm movements of the person held onto said bed-like support means by said holding means.

2. An apparatus according to claim 1, characterized in that said base frame means and said upright frame means are assembled of standard interconnecting frame parts detachably secured togehter by bolt and slider means.

3. An apparatus according to claim 1 or 2, cahracterized in that said bed-like support means is also assembled of standard interconnecting frame parts detachably secured together by bolt and slider means.

4. An apparatus according to claim 1, 2 or 3, characterized in that said adjustable means includes means for selectively securing said holding means on said bed-like support means in different height positions to compensate for differences in height and/or weight of the person using the apparatus.

5. An apparatus according to claim 1, 2, 3 or 4, characterized in that the balancing means includes a rod-like support member secured to said bed-like support means and slidably carrying thereon at least on balancing weight adapted to be fastened on said rod-like support member in a given selected position depending on height and weight of the person using the apparatus.

6. An apparatus according to claim 1, 2, 3 or 4, characterized in that said balancing means includes weight members operable to be readily detachably connected along the sides of said bed-like support means.

7. An apparatus according to any one of the preceding claims, characterized in that said pivotal connecting means includes selectively operable means for fixedly holding said bed-like support means in predetermined angular positions relative to said upright frame means.

8. An apparatus according to any one of claims 1-7, characterized in that said selectively operable means are located at least on one side of said bed-like support means and include a plate means secured to the side of said bed-like support means within the center area thereof an provided with a predetermined number of apertures lying with their axes on a circle about the pivot axes of said pivotal connecting means, and engageable means carried on a corresponding upright frame member for selectively enganging in the aperture corresponding to the chosen angular position of said bed-like support means relative to said upright fame means.

9. An apparatus according to any of claims 1-8, in which said bed-like support means includes longitudinal frame-like memebers, characterized in that the holding means includes a pair of boots secured to a plate-like bottom part located between the longitudinal frame-like members, said bottom part forming part of a transversely extending frame-like member interconnecting the lower ends of the longitudinal frame-like members.

10. An apparatus according to any one of claims 1-8, in which said bed-like support means includes longitudinal frame-like members, characterized in that the holding means includes a pair of padded ankle supports secured to a plate-like bottom part located between the longitudinal frame-like members, said bottom part forming part of a transversely extending frame-like member interconnecting the lower ends of the longitudinal frame-like members.

11. An apparatus according to any one of the preceding claims, characterized in that said adjustable means includes first adjustable means and second adjustable means in the form of said balancing means to compensate in a stepwise and continous manner, respectively, for changes in height and weight of the person using the apparatus.

12. An apparatus according to claim 11, characterized in that said first adjustable means includes means for selectively fastening said holding means on said bed-like support means in any one of a number of different height positions while the second adjustable means includes at least one support rod secured to said bed-like support means and carrying thereon at least one balacing weight adapted to be fastened in position thereof determined by the height and/or weight of the person using the apparatus.

13. An apparatus according to claim 12, characterized in that two balancing weights are slidably carried on said rod-like support means, and safety means on said rod-like support means on each side of said balancing weights to minimize injury to a person's fingers in case of accidental loosening of a balancing weight.

14. An apparatus according to any of claims 1-13, characterized in that said bottom part includes a readily interchangeable part to accomodate different shoe sizes for users of the apparatus.

15. An apparatus according to any one of the preceding claims, characterized by auciliary means adapted to be seized manually by the person using the apparatus and extending from said upright frame means to enable said person to return to the normal position.

16. An apparatus according to claim 15, characterized in that said auxiliary means is a flexible ladder-like structure lounted on the upper transverse member of said upright frame means.

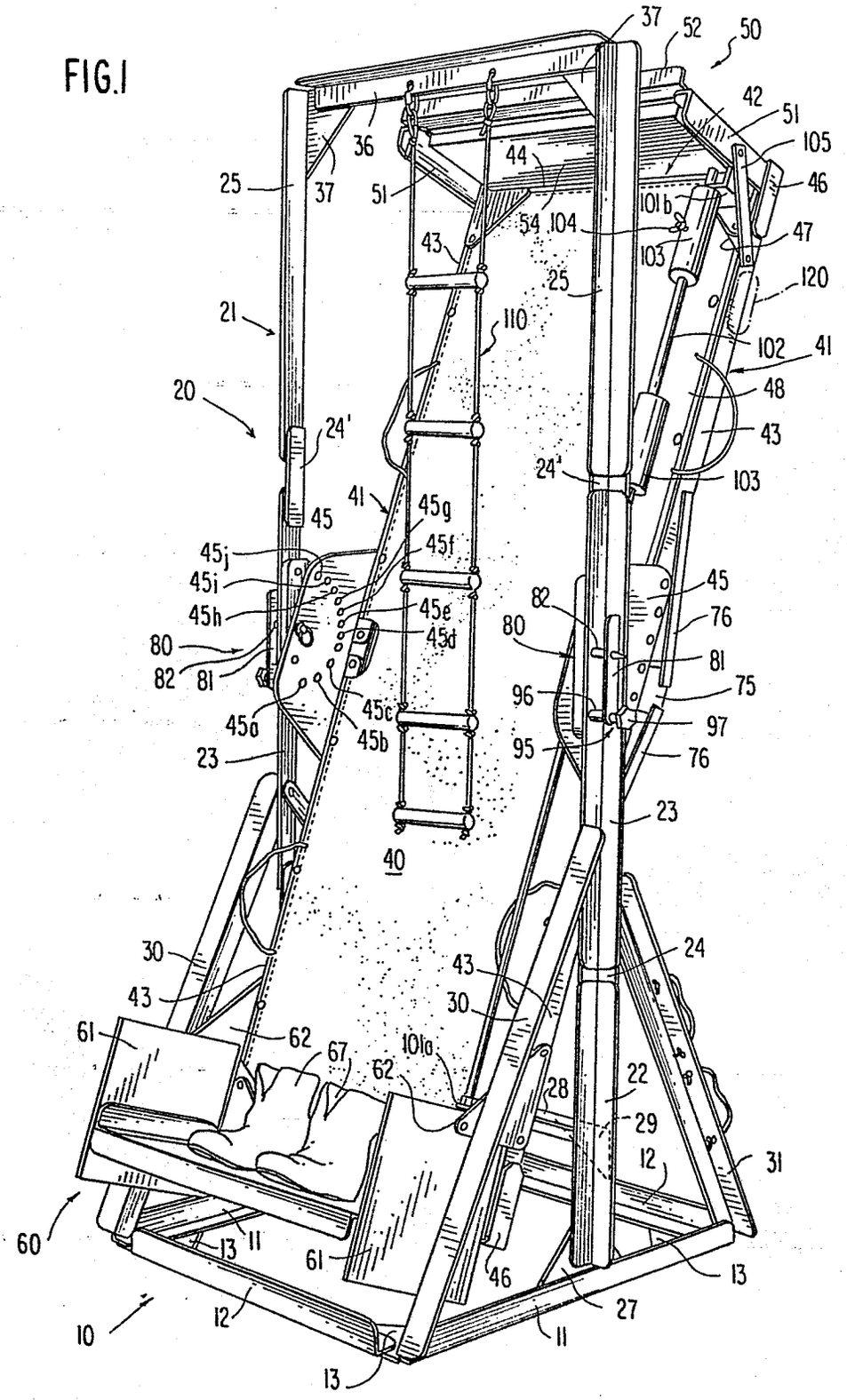
17. An apparatus according to any one of claims 1-16, characterized by guide means extending over a part of bed-like support structure and fixed at both ends to the frame structure to enable the user of the apparatus to pull into the inverted position so that with the bed-like support structure so balanced by said adjusting means that it will always seek to return to the non-inverted starting position, the bed like support structure will seek to return to said starting position upon release of the guide means by the user.

18. An apparatus according to claim 17, characterized in that the guide means includes a rope passing from the upper transverse frame member at the upright frame means by way of roller means secured to the upper end of the bed-like support structure back to the frame structure.

19. An apparatus according to any one of claims 1-18, characterized by further means adapted to be engaged during movement from the normal non-inverted position to the inverted position to the inverted position which upon return of the bed-like support structure from the inverted position toward the non-inverted position will holdthe bed-like support structure in the stubstantially horizontal position.

20. An apparatus according to any one of the preceding claims, characterized by belt-like means operable to be selectively engaged around the waist area of the user of the apparatus.

FIG.1


37
52
50
42
51
105
46
36
44
25
37
51
101b
54
104
47
43
103
25
120
21
110
102
41
20
48
24'
43
24'
103
41
45g
45
45f
45j
45i
45h
45e
45d
80
82
81
45c
45a
45b
23
40
45
82
76
80
81
96
75
97
95
76
23
24
30
43
43
30
61
62
67
101a
62
22
28
29
12
31
60
13
11
61
46
13
10
12
27
11
13

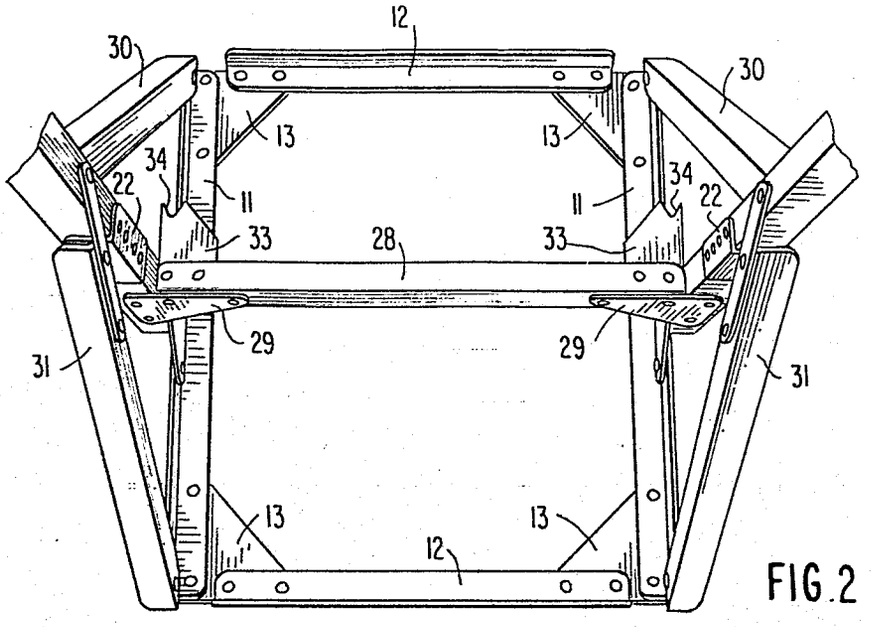


FIG.2

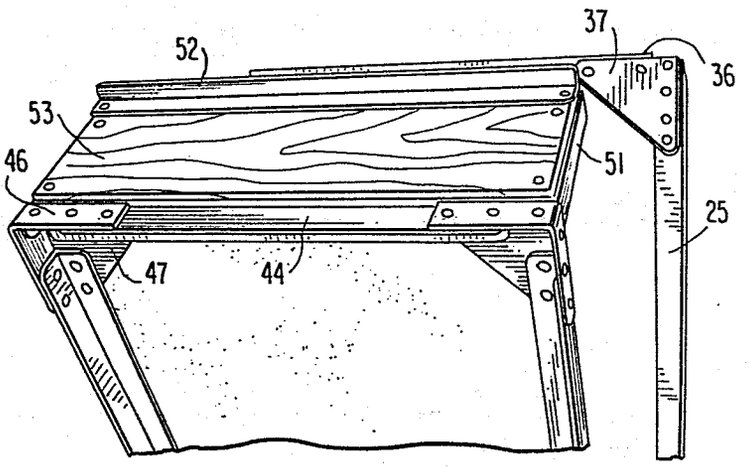


FIG.3

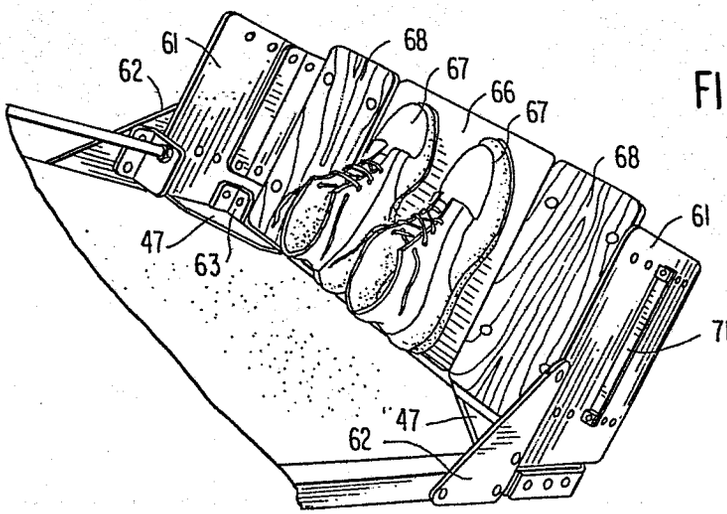
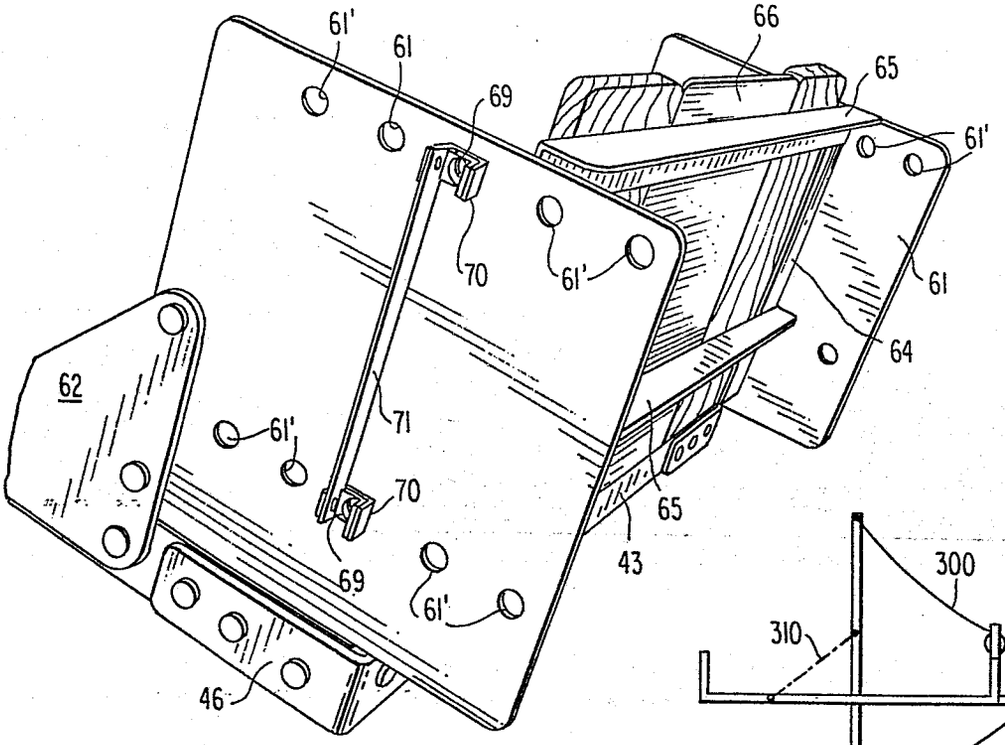


FIG.4

FIG.5



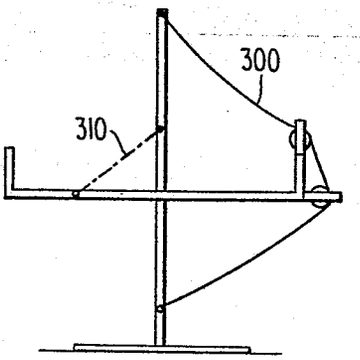


FIG.9

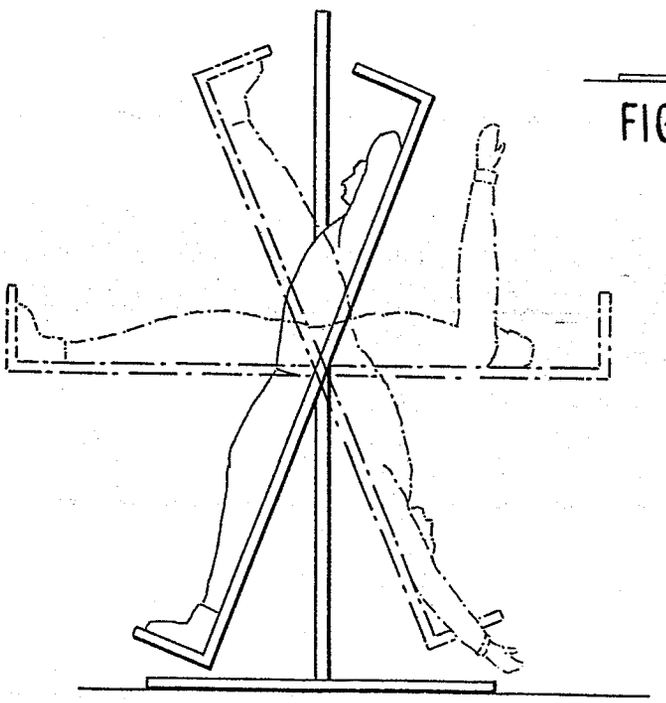


FIG.6

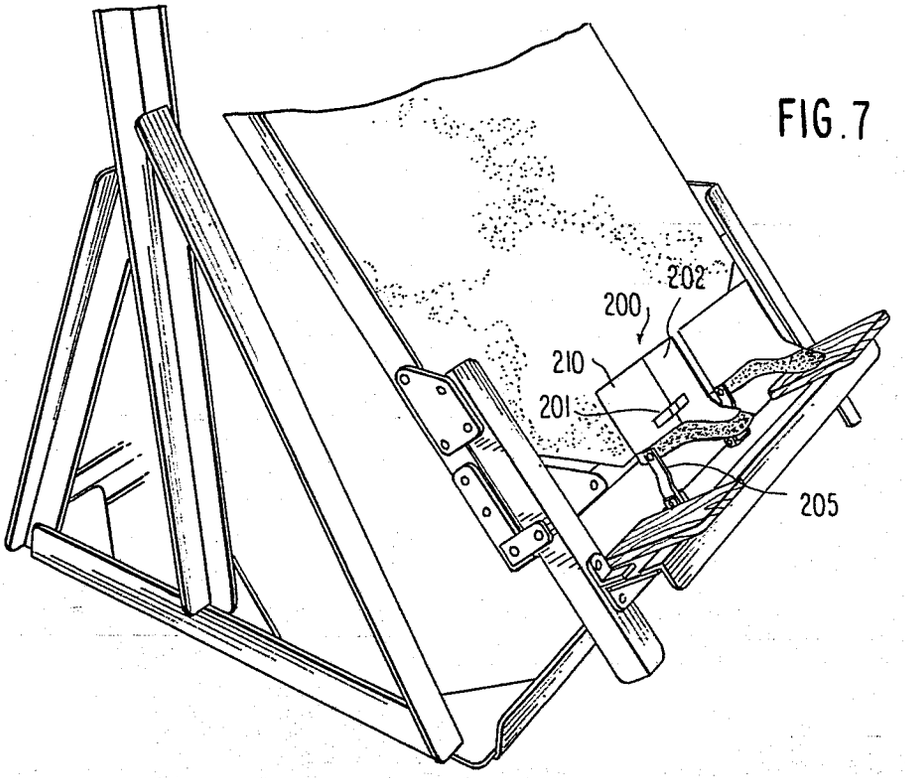


FIG.7

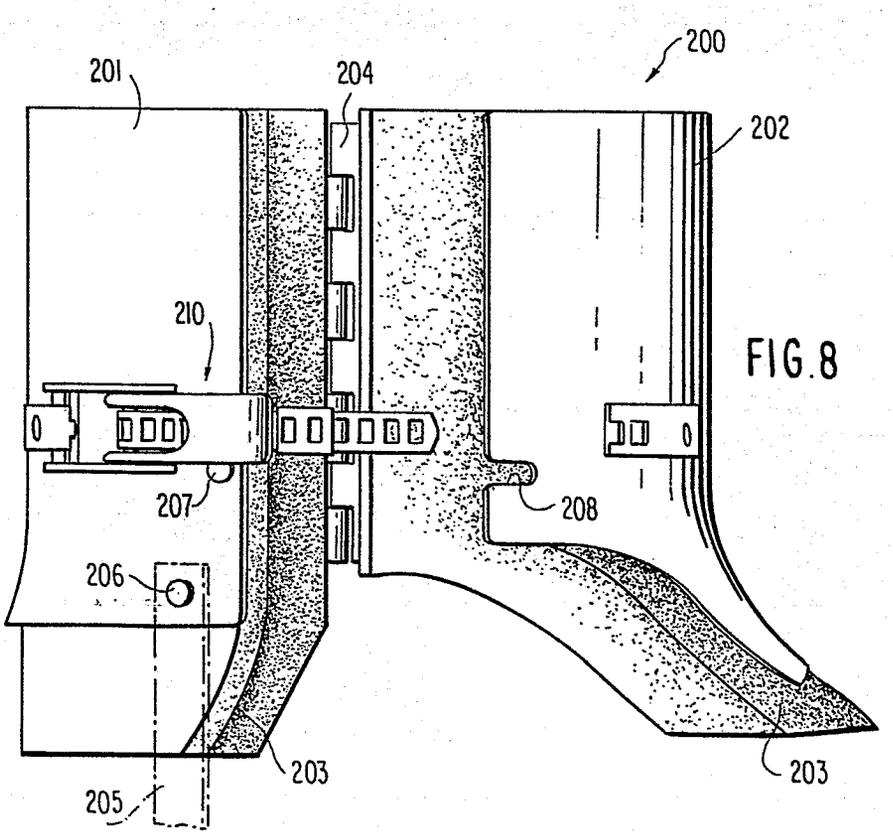


FIG.8