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T. C. ABDALLAH

2,812,010

BALANCING AND WALKING DEVICE

Filed Aug. 2, 1955

2 Sheets-Sheet 1

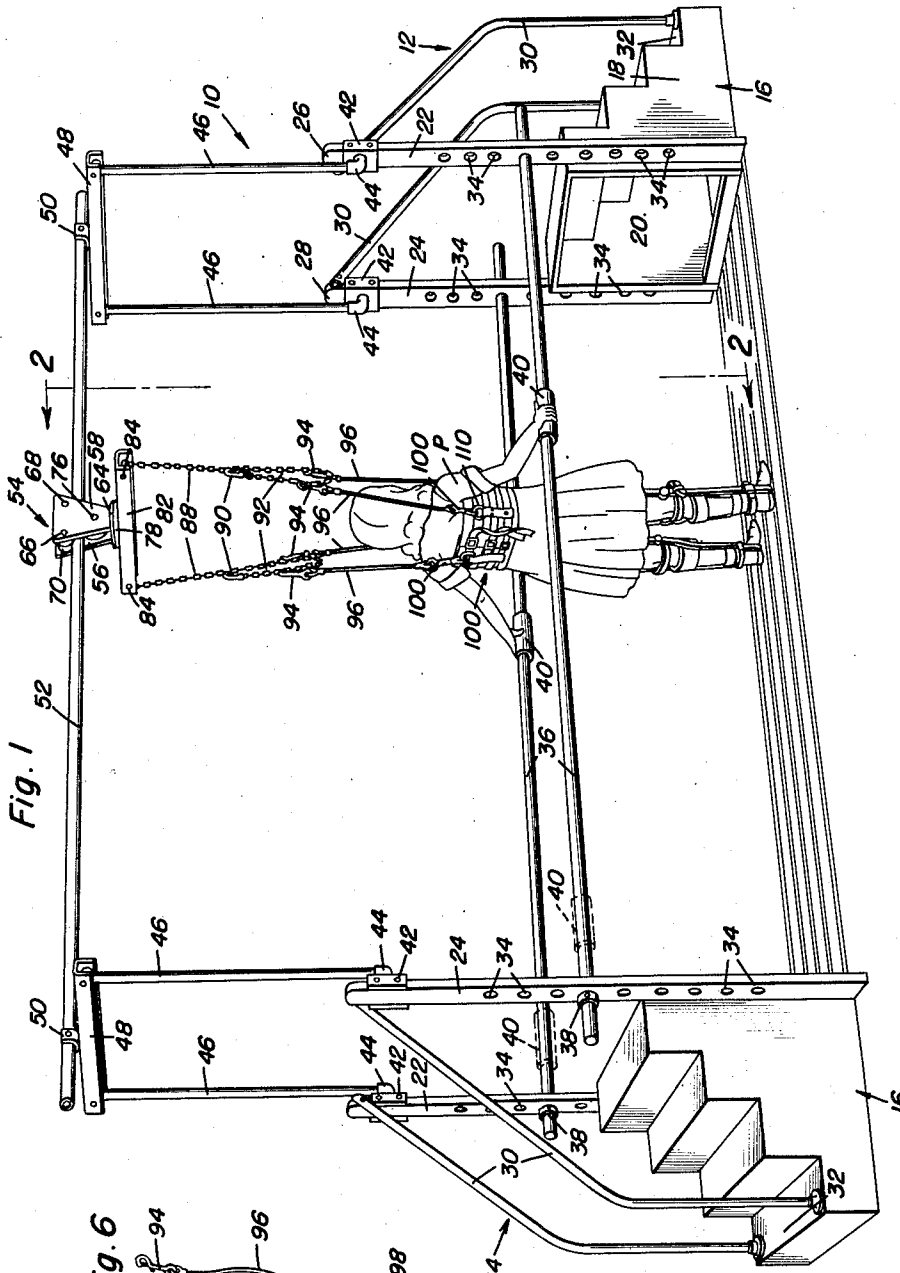


Fig. 1

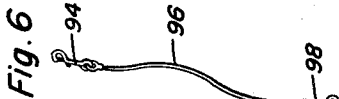


Fig. 6

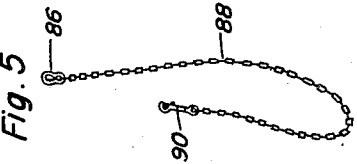


Fig. 5

Therese C. Abdallah
INVENTOR.

BY *Clarence A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

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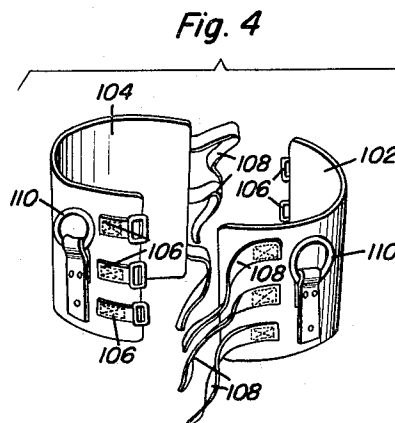
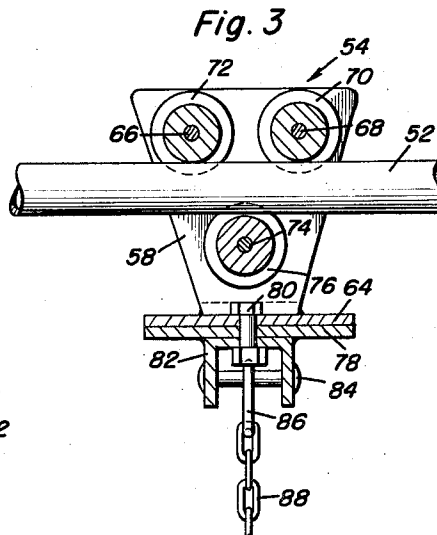
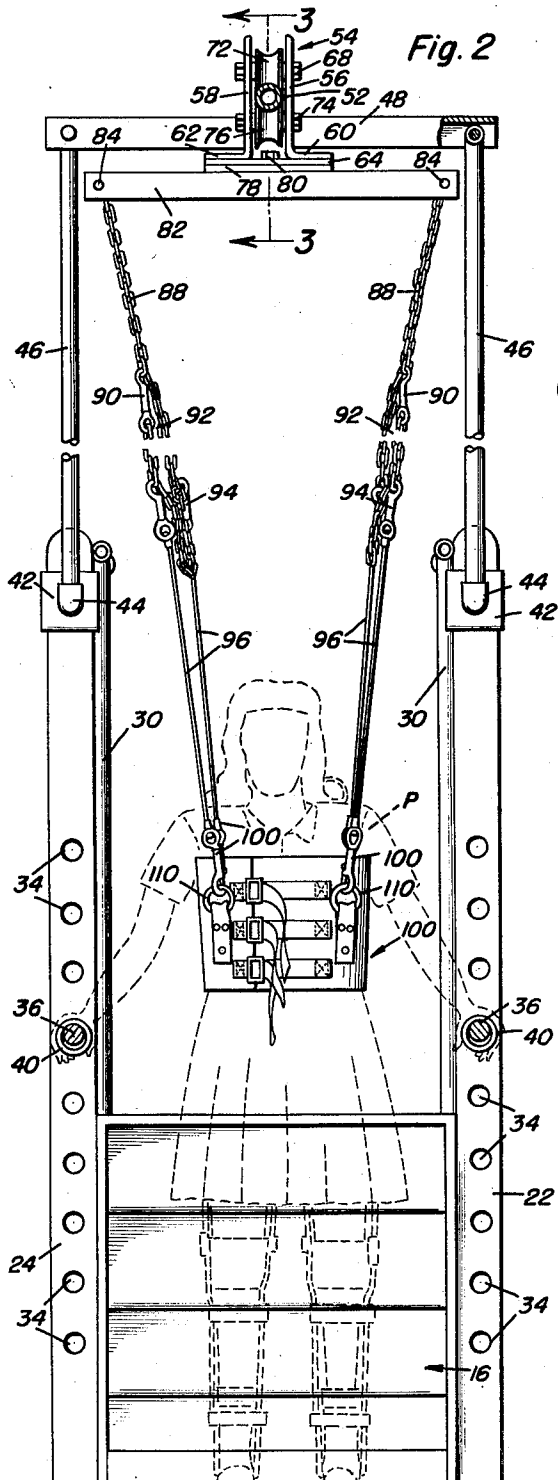
T. C. ABDALLAH

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BALANCING AND WALKING DEVICE

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2 Sheets-Sheet 2



Therese C. Abdallah
INVENTOR.

BY *Alvanice A. O'Brien*
and *Harvey E. Jacobson*
Attorneys

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2,812,010

BALANCING AND WALKING DEVICE

Therese C. Abdallah, Seattle, Wash.

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1 Claim. (Cl. 155—23)

This invention relates generally to therapeutic training devices and is more particularly concerned with apparatus for training balance in walking of patients, such as those afflicted by infantile paralysis, cerebral palsy and the like.

In many diseases the patient is left in a condition where the muscles of the arms and legs must be trained and/or re-trained and developed through the application of physical therapy and the dead weight of the patient must be entirely supported. Generally, the physical therapist must have both hands free to be able to move the patient forward or rearward as well as moving the arms and legs of the patient to simulate their movements during walking.

Accordingly, a primary object of invention in conformance with that set forth above is to provide a pair of vertically adjustable horizontal hand rails carried at opposite end portions by vertically extending support means which support an elevated longitudinally reciprocable carriage assembly, said carriage assembly being operatively connected to vertically adjustable flexible support elements engageable on front and rear portions of a belt assembly strapped on a patient, so the patient may be moved in a substantially straight line in a safe and careful manner by a physical therapist.

A further object of invention is to provide an improved physical therapy support apparatus.

Still another object of invention is to provide a walking and balancing training device for patients incapable of supporting their own weight.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the novel balancing and walking training device showing the manner in which a patient may utilize the same;

Figure 2 is an enlarged sectional view taken substantially on line 2—2 of Figure 1;

Figure 3 is a further enlarged sectional view taken substantially on line 3—3 of Figure 2;

Figure 4 is a perspective view of the belt assembly used with the device;

Figure 5 is a view of one of the flexible chain link elements utilized with the support belt assembly; and

Figure 6 is a view of a flexible cable element utilized in supporting the belt assembly.

Indicated generally at 10 is the novel balancing and walking training apparatus which includes a pair of oppositely disposed vertically extending support assemblies 12 and 14. The support assemblies 12 and 14, each include a support base portion 16 which take the configuration of a suitable stair construction, which includes secured in any suitable manner to oppositely disposed side portions 18 and 20 outwardly and vertically extending elongated vertical support elements 22 and 24 which have secured

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at their upper ends 26 and 28, respectively, hand rail elements 30 which have their lower ends suitably secured to the lower tread or step 32 of the step assembly 16. Each of the support portions or stair portions 16 are identical and accordingly the description of one is believed to be sufficient. The elements 22 and 24 each include a plurality of vertically disposed aperture portions 34, the apertures 34 of one assembly 16 being alignable with similar apertures 34 in the oppositely disposed support assembly 16 at the other end of the apparatus. Extendable through the apertures 34 of the aforementioned support elements are the ends of relatively parallel hand rail elements 36 which may be moved in the aperture portions 34 to accommodate the hands of the patient P thereon, said rail elements being retained in a relatively fixed position by means of suitable removable collar elements 38, of any suitable character, which prevent longitudinal shifting of the rail elements 36. Of course, as seen in Figure 1, only those collar elements 38 nearest to the viewer may be seen, it being understood that there are similar collar elements on the opposite ends of the rails 36. The rail members 36 have reciprocally supported thereon slidable hand-grip elements 40 which may be gripped by the patient P whereupon the patient will not have to move the hands each time a step is taken, or in the event the patient has insufficient strength in the hands, the hands may be bound by means of elastic bandages to the slide elements 40. Of course, if the patient has sufficient strength in the hands the elements may be left in the position shown in dotted lines in Figure 1.

Each of the support elements 22 and 24 have secured thereon adjacent the upper end portions 26 and 28, respectively, a suitable support plate 42 permitting the securement therein of one end of an elbow element 44, the other end of which being secured to a vertically extending support rod 46, said support rod being suitably connected to a transversely extending downwardly opening U-shaped channel element 48. On the upper surface of the channel element 48 is an upwardly opening U-shaped securing element 50 which has the opposite ends of a mono-rail 52 suitably secured therein.

A support carriage assembly 54 is reciprocally supported on the rail 52, said assembly including a pair of oppositely disposed mutually parallel plate elements 56 and 58 which have lower outwardly extending flange portions 60 and 62, respectively, which are secured to a lower support plate 64, in any suitable manner. The plates 56 and 58 have extending transversely thereof a pair of spaced shaft elements 66 and 68, of any suitable character, which rotatably support suitably grooved guide wheels 70 and 72, which are rotatably and reciprocally carried on the rail 52. A lower transverse shaft 74 extends between the plates 56 and 58 and rotatably supports a suitably grooved guide wheel 76 which is engageable with a lower portion of the rail 52.

A rotatable plate 78 is mounted on the plate 64 of the carriage assembly by means of a vertically disposed pivot element 80, of any suitable character, said plate 78 having secured thereto a transversely disposed downwardly opening U-shaped channel element 82 which has extending through opposite end portions transverse support pins 84, of any suitable character.

Pivotaly disposed on the pins 84 is a link element 86 of a flexible support chain 88, said chain including at the other end a detachable fastening element 90 of any suitable character. The connecting element 90 serves to provide means for forming a loop 92 at the bottom of the chain, see Figure 1, opposite sides of which having secured thereto one detachable end 94 of a flexible support cable 96, the other end of the flexible support cable having a detachable securing element 98 thereon which is suit-

ably secured to the support belt assembly indicated generally at 100.

The support belt assembly 100 includes a pair of semi-oval shaped side portions 102 and 104 of any suitable material, a belt being engageable around the chest and back of the patient, see Figures 1 and 2, and including a plurality of vertically disposed cooperating buckle and strap portions 106 and 108, respectively. The buckle and strap elements are secured in any suitable manner on the side portions 102 and 104 and cooperate to fit beneath the arm pits of the patient as seen in the aforementioned figures. Secured in any suitable manner on the belt assembly are oppositely disposed fastening rings 110 which will be positioned at the front and the rear of the patient when the belt assembly is in position, said ring elements 110 being engageable with the detachable elements 100 of the flexible cables 96, the belt assembly serving to support substantially all of the dead weight of the patient P.

Although the support belt in conjunction with the flexible elements 88 and 96 support substantially all of the dead weight of the patient, the patient may also have suitable leg braces of any suitable character, and in order to make the patient more mobile skates may be secured on the patient's shoes (said skates not being shown).

Thus it is believed readily apparent that after the horizontal hand rails 36 have been adjusted in the proper position to be engaged by the hands of the patient, the flexible elements 88 and 96 may be adjusted to accommodate for the height of the arm pits of the patient, and the weight of the patient will be supported in such a manner to permit a physical therapist working with a patient to have his arms free to simulate the walking movement of the patient.

The stair portions 16 and hand rails 30 provide for exercising the legs and arms of advanced patients ascending the stair portions to the hand rails 36, and also provide elevated seats at the tops thereof for seating patients while the belt assembly 100 is being attached and adjusted preparatory to a patient being exercised between the hand rails 36 and the stair portions 16.

Various positional directional terms such as "front," "rear," "top" are utilized herein to have only a relative connotation to aid in describing the device and are not

intended to require any particular orientation with respect to any external elements.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A balancing and walking training device for invalid patients comprising a pair of horizontally spaced stair portions stepped upwardly toward each other, a pair of vertical support elements fixed to opposite sides of each stair portion and rising above the same opposite the highest step thereof, a pair of horizontal laterally spaced hand rails having ends vertically adjustably secured in the pairs of vertical support elements for vertical adjustment relative to said stair portions and forming between the rails of the pair a walking and balancing space for a person grasping said horizontal rails at opposite sides of each stair portion fixed to the lowest tread thereof and to the support elements rising from the stair portion for assisting a patient ascending said stair portions, a pair of upright parallel rods fixed to and rising from each pair of support elements, a crossbar supported by each pair of upright rods, a horizontal mono-rail supported by the pair of crossbars above the pair of horizontal hand rails in centered parallel relation to said pair, a carriage mounted on said mono-rail, and a support belt suspended from said carriage for suspending a patient between said stair portions and said pair of horizontal hand rails.

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