

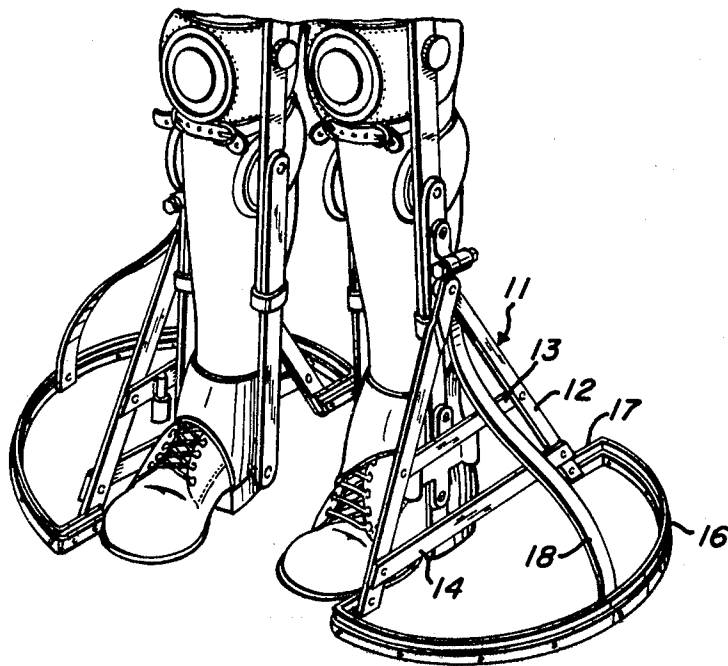
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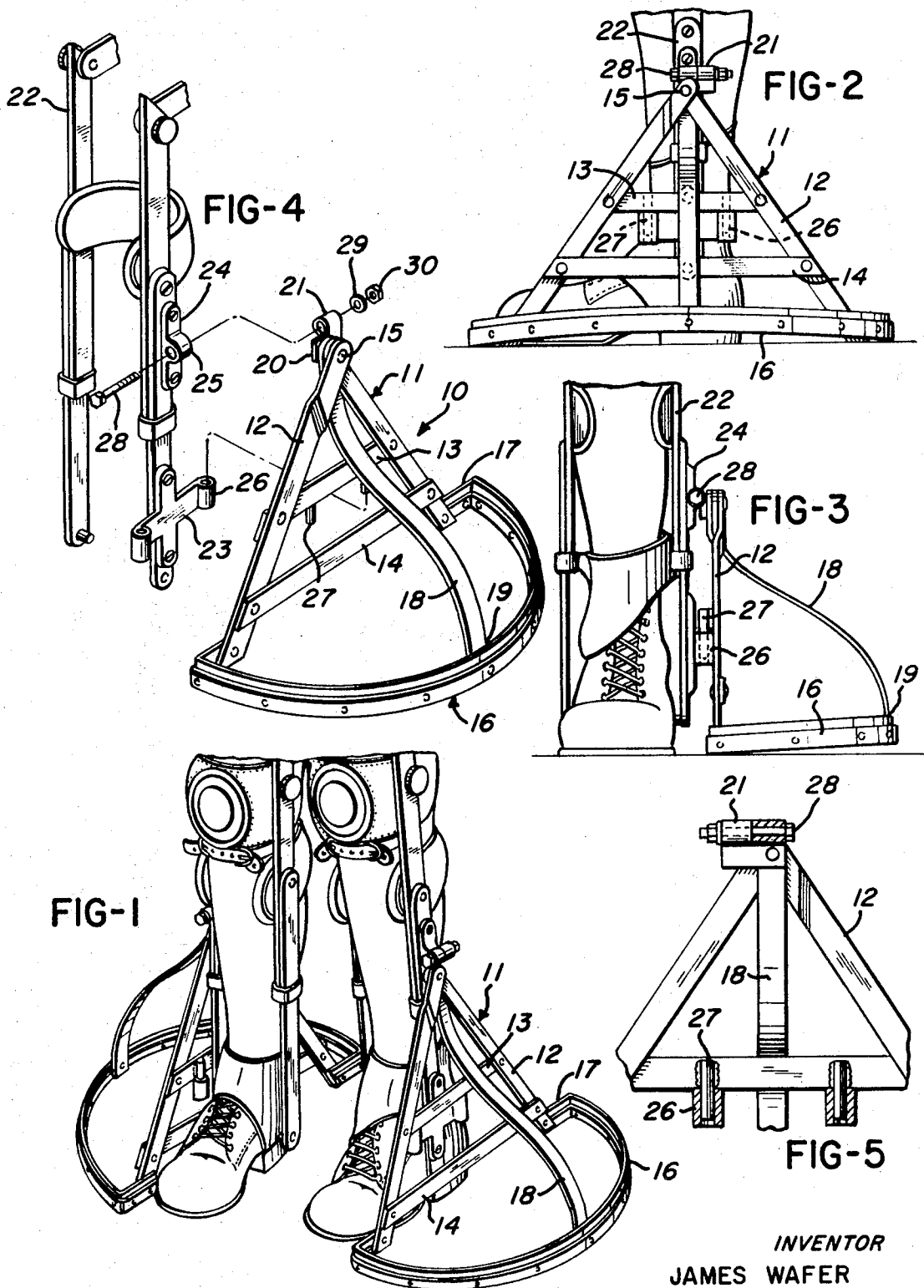
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[54] BRACE APPARATUS
10 Claims, 5 Drawing Figs.

[52] U.S. Cl..... 128/80,
128/83.5; 272/70.1
[51] Int. Cl..... A61F 3/00
[50] Field of Search..... 128/80,
83.5, 84; 272/70.1, 70.2; 3/4; 135/45, 62, 47

ABSTRACT: Apparatus for maintaining the equilibrium of a person afflicted with lack of muscular control in his legs or pedal extremities characterized by a bracelike attachment providing an elongate base expanding outwardly to the side of the wearer.





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BRACE APPARATUS

This invention has particular reference to unique leg appliances or brace-like substitutes of distinct therapeutic, as well as orthopedic, value to those afflicted persons who have difficulty in standing and walking.

Victims of diseases such as cerebral palsy or poliomyelitis are often times incapable of either standing or walking without support of their arms. This is due to the lack of coordination and muscular control. Moreover, even when their muscular control and coordination starts to improve, their mental attitudes make it very difficult to get them to try to stand alone, let alone to try to walk. This last can be easily understood when one considers the fact that devices heretofore available for the assistance of such afflicted persons have involved arm supports in the nature of parallel bars and crutches. The use of such supports does not readily give the handicapped the courage to stand or walk without them except after long and difficult periods of physical training.

The present invention provides simple but unique embodiments the use of which quickly overcomes many of the physical and mental problems of afflicted persons such as above described. In their preferred form the embodiments consist of brace-like leg attachments which afford stabilizing influences enabling the wearer to stand and make an effort to walk without the need of arm supports.

It should be pointed out that when a person finds standing or walking either very difficult or almost impossible, he becomes mentally depressed. This retards efforts to rebuild his body. Thus, by making it possible for a person with deficient or defective underpinning to stand without arm supports and even to take a step or two without falling on his face, the present invention provides an inherent therapeutic benefit.

A primary object of the invention is to provide a brace-like attachment for application to the legs of a person afflicted with difficulty in standing or walking which is economical to fabricate, most efficient and satisfactory in use and adaptable to suit a variety of needs.

A further object of the invention is to provide means to encourage standing and walking by persons whose physical conditions make the same extremely difficult.

Another object of the invention is to provide apparatus enabling persons afflicted with vertical instability or poor muscular coordination to stand and make effort to walk with greater confidence.

An additional object of the invention is to provide apparatus possessing the advantageous structural features, the inherent meritorious characteristics and the means and mode of use herein described.

With the above and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combination thereof, and the mode of operation as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the drawings wherein one but not necessarily the only form of embodiment of the invention is illustrated,

FIG. 1 illustrates an application of a preferred embodiment of the invention to the legs of a person afflicted with cerebral palsy;

FIG. 2 is a view taken from the side of the person shown in FIG. 1;

FIG. 3 is a front view of the invention apparatus as applied to the leg;

FIG. 4 is an exploded view of the invention apparatus and the means of attachment thereof; and

FIG. 5 is a detail view of a fragmentary portion of the invention apparatus.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, it may be there seen that the invention device in the preferred form illustrated consists of an open framework 10. This includes an A-shaped portion 11 adapted to orient vertically of a ground surface with its apex uppermost. The portion 11 includes downwardly divergent sidebars 12 bridged at their centers by a cross bar 13 and ad-

jacent and spaced from their lower ends by a further crossbar 14. It is to be noted that the crossbar 13 is fixed at what might be considered the inner surfaces of the bars 12 while the bar 14 is fixed to their opposite or outer surfaces. Note further that the upper end of the one bar 12 is offset to overlies the upper end of the other bar 12 in forming the apex of the A-frame. The bars 12 are connected at this apex by a pin 15.

Connected to the base of the A-frame 11 is a semicircular frame portion 16. The respective extremities of the semicircular frame portion 16 are mutually bent on the diameter thereof to provide short links which are fixedly pinned to the respective lower extremities of the bars 12 of the A-frame 11. Further included in the framework 10 is a brace bar 18 one extremity 19 of which is fixed at the center of the semicircular frame portion 16. From its extremity 19 the bar 18 extends upwardly, first with a gentle inclination in the direction of the frame portion 11 and then more sharply towards a horizontal to extend inwardly of the frame portion 11 over the approximate center of the bar 13. The extremity of the bar 18 remote from its extremity 19 is bent directly upward to accommodate the projection therethrough of the pin 15 and be fixed in abutting relation to the apex of the frame portion 11. Also fixed to a further projected portion of the pin 15 is a plate-type bracket 20 including a horizontally oriented projected loop 21.

Referring to the drawings, it is there seen that for purposes of illustrating the invention in application to the legs of a person afflicted with cerebral palsy there is shown attached to the legs of the individual conventional strengthening brace bars 22 which are conventionally applied to the legs and to the shoes. The details of such structure will not be further described except as modified to accommodate the application of the open framework 10. As seen in FIG. 4 of the drawings, fixed in vertically spaced relation on the outer surface of the outermost of the brace bars 22 are a pair of brackets 23 and 24. The bracket 24 is uppermost and includes a vertically elongated base which is attached by screws to the adjacent bar 22 and a projected loop portion 25 defining an aperture corresponding in diameter to that in the loop 21. On the other hand, the bracket 23 which is adjacent the lower end of the same bar 22 includes a vertically elongate base attached to the bar 22 and horizontally projected arms the projected extremities of which are formed with vertically oriented loops 26.

Take particular note of the fact that the bar 13 of the frame portion 11 has welded thereto a pair of horizontally spaced vertically dependent pins 27. The spacing of the pins 27 correspond to the spacing between the loops 26 on the bracket 23.

Thus, it may be readily seen that where a conventional strengthening leg brace is applied to the handicapped person, the device of the invention may be simply and readily attached. The brackets 23 and 24 may be suitably secured to the outer face of the outer bar of each leg brace unit of the wearer and the open framework 10 readily applied by disposing the pins 27 in the loops 26 of the bracket 23 and simultaneously the loop 21 is aligned with the loop 25 on the bracket 24. A threaded bolt 28 is then inserted through the aligned loops 25 and 21 to have its projected extremity receive thereon a washer 29 and a nut 30. Once the nut is applied and tightened the structure 10 is in position in respect to each of the legs.

Attention is directed to FIGS. 2 and 3 of the drawings which clearly indicate that the suspension and connection of the framework 10 is such to dispose the A-frame portion 11 vertically and slightly outward of the side of the leg, the base of the A-frame and the interconnected diametrically aligned portions 17 of the frame portion 16 seating to the ground. At the same time, it will be seen that the orientation of the frame portion 16 at this point, in the preferred embodiment illustrated, is at a small angle to the ground surface.

Accordingly, when the handicapped person wearing the brace-like supports 10 to either side of his legs assumes a standing position there will be a base support adjacent and spaced outwardly of each side of the person. This support is elongated

in reference to the foot of the wearer so that it projects forwardly and rearwardly of the foot, and to a greater distance to the rear. The structure as described has a tendency to prevent a fall either forwardly or backwardly. At the same time, the braced base portion 16 gives a slight rocking freedom of the individual from side to side which is natural for unstable persons of the type with whom we are here concerned. In the event of any lateral rocking, the projected frame portion 16 quickly gives the person an extended and broad base inhibiting an actual falling to the side. Therefore, the effect of the attachment of the bracelike structure 10 is to give a broad and extremely stable base to the wearer. This lends considerable confidence to the person who finds that in spite of his physical handicaps he will not fall. Another advantage of the angularity of the frame portion 16 to the base of the frame portion 11 is that it facilitates the wearer of the brace structures stepping forward and in the course of stepping forward inhibits the tendency to stumble or fall, the frame portion 16 accommodating a rocking to the side and the extension of the base of the A-frame inhibiting the tendency to fall forward on the face.

It will thus be seen that the invention provides an extremely simple and economical structure which takes into consideration the problems at hand. The use thereof results in the wearer being immediately imbued with a degree of self-confidence which is mentally stimulating, particularly in that the wearer finds that with the apparatus attached there is a minimal need for arm supports to assist in standing or walking. Tests have shown that children afflicted as described who have been incapable of self-help previously have with the benefit of the invention devices enjoyed a new ability for self-help in standing and walking.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

I claim:

1. An orthopedic device for attachment to the legs of an infirm person to enable and encourage self-help in efforts to stand and walk comprising brace means for attachment to the side of a leg including vertical support means connected intermediate the extremities of said brace means and having its lowermost end adjacent the lower end of the brace means and extending forwardly and rearwardly of said brace means, the lowermost portion of said vertical support means being adapted to contact ground surface substantially coincidentally with the pedal extremity of the adjacent leg, said vertical support means having in connection therewith means projected outwardly substantially normal to said vertical support and from the lowermost portion thereof to provide a lateral stabilizing means for the leg, to inhibit any tendency for the per-

son wearing said device to fall forwardly or rearwardly when either standing or walking.

2. A device as in claim 1 characterized by said vertical support means including a vertically disposing portion of generally planar configuration the dependent extremity of which defines a ground contacting portion.

3. A device as set forth in claim 1 characterized by said vertical support means being peripherally convergent in an upward sense, from said dependent extremity which defines said ground contacting portion, vertical spaced portions thereof being provided with attachment means to dispose the said vertical support means outwardly of the pedal extremity of the adjacent leg.

4. A device as set forth in claim 1 characterized by said support means having a base which inclines upwardly and outwardly from the dependent extremity of said support, to the side thereof which disposes outermost with respect to the leg to which it is applied.

5. A device as set forth in claim 1 characterized by said ground contacting portion having in connection a periphery which is formed in a generally semicircular configuration.

6. A device for attachment to the legs of an infirm person to enable and encourage self-help in efforts to stand and walk comprising a support medium including means for disposing at the outer side of the leg and formed to provide a vertical influence and a lateral stabilizing effect at that side, said medium further including means projecting in a sense forwardly and rearwardly of the lower extremity of the leg to which it is applied to inhibit any tendency for the person wearing the device to fall forwardly or rearwardly when either standing or walking, said support medium being characterized by a base support portion at its lower extremity for seating to ground surface thereunder, inclining upwardly and outwardly therefrom, a vertically disposing support portion interconnecting with said base portion, and said base portion having the periphery thereof formed in a generally semicircular configuration, said vertically disposing support portion being an A-frame including in connection therewith means for attachment thereof in connection with the leg.

7. A device as in claim 6 for attachment to conventional vertical bars of leg braces used in rigidifying the legs of infirm persons including connecting means at the apex of the vertical bars of leg braces used in rigidifying the legs of in-

8. A device as in claim 1 wherein said support means is an open framework the base of which is adapted to be angularly disposed in reference to the wearer's leg when the device is attached to the person.

9. A device as in claim 8 wherein said base has a semicircular configuration and said ground contacting portion lies in a line substantially coincident with its diameter.

10. A device as in claim 1 wherein the vertical support means for the leg is adapted to be attached at vertically spaced locations along the leg, said vertically arranged support means terminating at its lower end in an outwardly bowed portion providing said stabilizing means which extend forwardly and rearwardly, the lateral stabilization being reinforced by a brace bar attaching at one end to said bowed portion immediately of the ends thereof and extending at its other end to attach to said vertically arranged support means at an upper one of said vertically spaced locations.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,557,782

Dated January 26, 1971

Inventor(s) James Wafer

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 20, cancel "in connection"; same column line 40, beginning with "7. A device" cancel all to and including "the A-frame." in line 44, same column 4 and insert instead:

7. A device as in claim 6 for attachment to conventional vertical bars of leg braces used in rigidifying the legs of infirm persons including connecting means at the apex of the vertical support portion and in horizontally spaced relation at a cross bar of the "A" frame.

Signed and sealed this 7th day of September 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Acting Commissioner of Patent