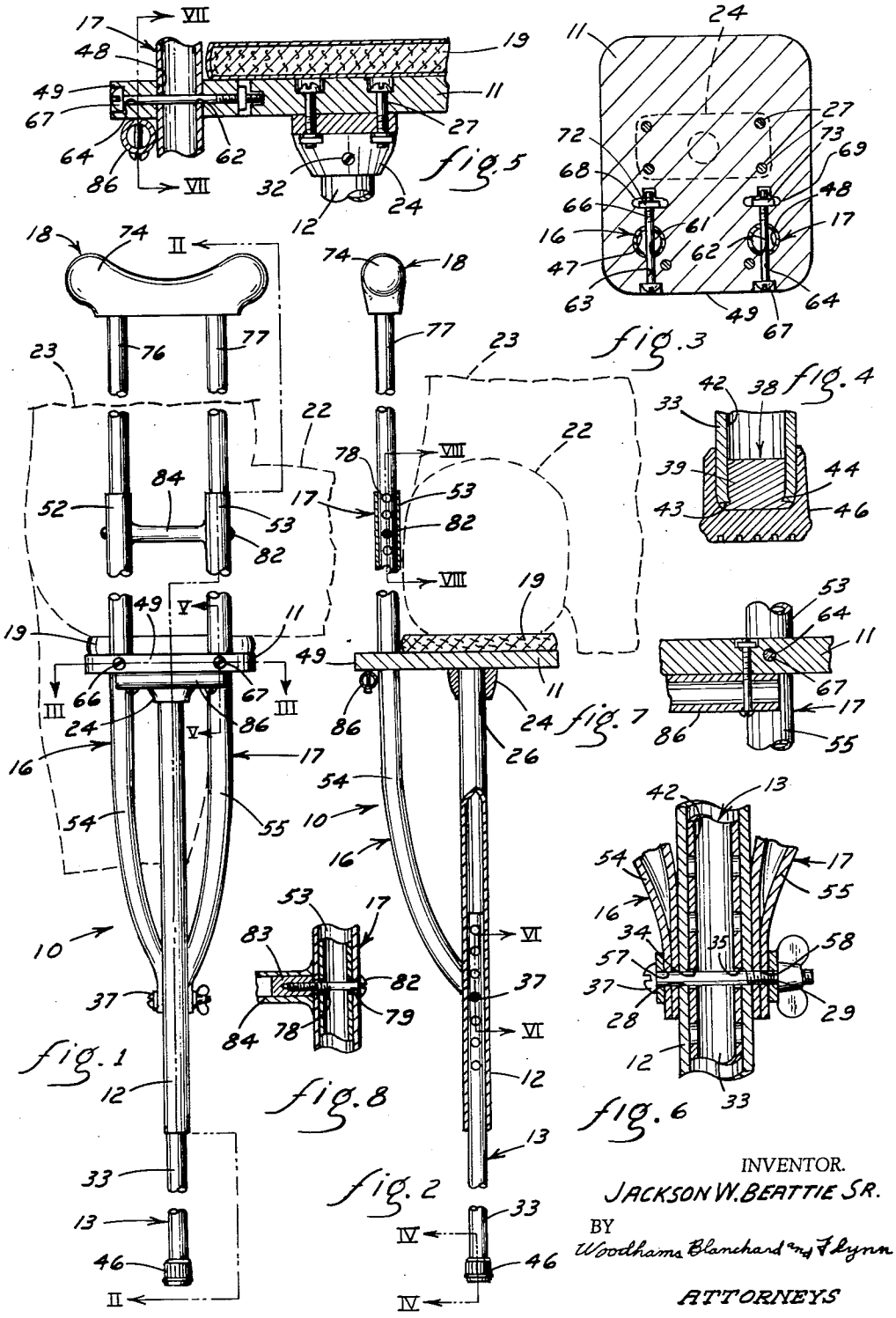
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RIDING CRUTCH

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RIDING CRUTCH

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This invention relates in general to a crutch and, more particularly, to a type thereof which is especially designed for use by a person who is unable to use for support the portion of one leg below the knee thereof, but who must from time to time spend prolonged periods in a standing position.

It is well known that many people, such as amputees, require a crutch or artificial limb for the purpose of standing erect and that some of these people are unable to use any portion of one leg below the knee thereof to support themselves in the erect position. It has been found that existing devices for supporting this latter group are not entirely satisfactory under many circumstances. For example, these people find that it is difficult and/or painful to remain erect for extended periods of time with existing support devices. Conventional crutches not only impede the use of the arms, but they also cause soreness. Furthermore, the support provided by crutches is out of balance and often results in serious falls.

Artificial limbs and knee crutches often produce pain after long periods of use, and some people are unable to use them at all. Moreover, artificial limbs are often inconvenient, as where they have been removed and are suddenly needed.

In studying this problem, it occurred to me that the upper thigh or buttock has been designed by nature to support continuously the entire weight of that portion of the body thereabove. Accordingly, by making use of this portion of the body to support the remainder, the above problems are overcome. However, none of the crutches or other support devices with which I am familiar have either taken this into consideration or been properly designed for this type of use.

Accordingly, a primary object of this invention has been the provision of a crutch structure which is particularly adapted for use by a person having one leg which is incapable of providing support below the lower thigh, particularly where such person desires to remain in an upright or standing position for an extended period of time.

A further object of this invention has been the provision of a crutch structure, as aforesaid, which is capable of use for the purpose of moving from one place to another without necessitating any change in the position of the person with respect to the crutch by which he is supported.

A further object of this invention has been the provision of a crutch structure which is comfortable to use, even by people who have leg injuries which impair only the use of the foot, which is well balanced for use not only in a substantially stationary position but also when being used for moving around, which is sturdy in construction and completely safe, thereby giving a feeling of security to the person using the crutch.

A further object of this invention has been the provision of a crutch structure, as aforesaid, having adjustment mechanism for adapting the crutch to use by persons of different heights and proportions, which is light in weight, pleasing in appearance and easy to maintain.

Other objects and purposes of this invention will become apparent to persons familiar with this type of equipment upon reading the following specification and examining the accompanying drawings in which:

FIGURE 1 is a broken side elevational view of a crutch structure embodying the invention.

FIGURE 2 is a sectional view taken along the line II—II in FIGURE 1.

FIGURE 3 is a sectional view taken along the line III—III in FIGURE 1.

FIGURE 4 is a sectional view taken along the line IV—IV in FIGURE 2.

FIGURE 5 is a sectional view taken along the line V—V in FIGURE 1.

FIGURE 6 is a sectional view taken along the line VI—VI in FIGURE 2.

FIGURE 7 is a sectional view taken along the line VII—VII in FIGURE 5.

FIGURE 8 is a sectional view taken along the line VIII—VIII in FIGURE 2.

The terms "upper," "lower" and derivatives thereof will have reference to the crutch construction of the invention in its normal position of operation and as appearing in FIGURES 1 and 2. The terms "inner," "outer" and words of similar import will have reference to the geometric center of such crutch construction and parts thereof.

General description

The objects and purposes of this invention, including those set forth above, have been met by providing a crutch construction comprising a substantially flat seat member having a seat pad on its upper surface and an elongated leg member secured to the lower side of the central portion of said seat member and extending downwardly therefrom. An elongated foot element is adjustably supported on the lower end of the leg member. A pair of similar upright members are rigidly secured at corresponding points between their ends to the seat member near one edge thereof. The upper portions of said upright members extend substantially perpendicularly upwardly from the seat member and an armrest is adjustably mounted upon the upper ends of the upright members. The lower portions of the upright members curve from the seat member inwardly toward the leg member to which they are secured at their lower ends. A handgrip is mounted upon the lower surface of the seat member adjacent the upright members.

Detailed construction

The crutch member **10** (FIGURES 1 and 2) includes a seat member **11** secured to the upper end of a leg member **12** having a foot element **13** adjustably mounted upon its lower end. A pair of upright members **16** and **17**, which are preferably mirror images of each other, are rigidly secured at corresponding points between their ends to the seat member **11** and are rigidly, but releasably, secured at their lower ends to the leg member **12**. An armrest **18** is adjustably mounted on the upper ends of the upright members **16** and **17**.

The seat member **11** (FIGURES 1 and 2), which is preferably flat and substantially rectangular, may be fabricated from light-weight metal, plywood or the like. A seat pad **19**, which may be of any convenient material, such as foam rubber, is supported upon the upper surface of the seat member **11** for engagement by the upper thigh, indicated in broken lines at **22**, of a person **23** being supported by the crutch **10**. A flanged socket **24**, having a vertical, preferably cylindrical opening **26**, is mounted upon the lower surface of the central portion of the seat member **11** (FIGURE 3) by means of a plurality of bolts **27**. The heads of the bolts **27** may be recessed into the upper surface of the seat member **11** (FIGURE 5) in order to avoid interference with the seat pad **19**, or discomfort to the user of the crutch.

The leg member **12** (FIGURES 1 and 2) is preferably a straight, cylindrical tube having a pair of transverse, axially aligned bolt openings **28** and **29** (FIGURE 6) extending therethrough near to, but spaced upwardly from,

the lower end of the tube. The upper end of the leg member 12 is snugly received into the opening 26 where it may be held by means such as the set screw 32.

The foot element 13 (FIGURES 1 and 2) includes a straight, cylindrical tube 33 having a plurality of transverse, axially aligned openings 34 and 35 (FIGURE 6) arranged in pairs uniformly spaced along the tube 33 and alignable, one pair at a time, with the bolt openings 28 and 29 in the leg member 12 for reception of a bolt therethrough. The tube 33 has an opening 42 in the lower end thereof into which the substantially cylindrical shank 39 (FIGURE 4) of the plug 38 is snugly receivable. The plug 38 has an annular flange 43 at its lower end which projects radially outwardly and is engageable with the lower end of the tube 33. The shank 39 has an annular groove 44 adjacent the flange 43, and said flange has a rounded outer edge remote from the shank 39. After the shank 39 is inserted into the opening 42, the lower end of the tube 33 is swaged into the groove 44 whereby the plug 38 is rigidly secured to the lower end of the foot element 33. The rounded, relatively smooth lower surface of the plug protects the inner surface of the cup-shaped, resiliently flexible shoe 46 by the lower end of the foot element 13, which is slidably received into said shoe. The shoe 46 is provided to prevent slipping and protect the surfaces engaged by the foot element when the crutch is in use.

The upright members 16 and 17 (FIGURE 3), which are preferably tubular and circular in cross section, are snugly and slidably receivable through a pair of spaced openings 47 and 48 through the seat member 11 near one edge 49 thereof. The upright members 16 and 17 (FIGURE 1) have straight, parallel upper portions 52 and 53, respectively, which extend perpendicularly and upwardly from the seat member 11. The lower portions 54 and 55 of said upright members extend downwardly from said seat member and curve inwardly to points adjacent the bolt openings 28 and 29, respectively. The lower portions 54 and 55 preferably have parallel, flattened lower ends with coaxial bolt openings 57 and 58 through which the bolt 37 can extend, while it is extending through the bolt openings 28 and 29 in the leg member 12.

The upright members 16 and 17 each have a pair of transversely aligned bolt openings 61 and 62, respectively (FIG. 3), which are disposed between the upper and lower surfaces of the seat member 11. Said seat member has bolt openings 63 and 64, which are aligned with the bolt openings 61 and 62, respectively, in said upright members for simultaneous reception of bolts 66 and 67. Slots 68 and 69 are provided through the seat member 11 at the inner end of the bolt openings 63 and 64, respectively, for reception of nuts 72 and 73. The outer ends of the bolt openings 63 and 64 may be counterbored to receive the heads on the bolts 66 and 67.

The armrest 18 (FIGURES 1 and 2) is comprised of a padded member 74 and a pair of parallel elements secured to and extending downwardly from the padded member 74 for slidable reception into the upper ends of the upright members 16 and 17, respectively. The element 77 (FIGURE 2), for example, has a plurality of openings 78 arranged in uniformly spaced, transversely aligned pairs (FIGURE 8), which are alignable with a pair of openings 79 in the upper portion 53 of the upright member 17 for reception of a bolt 82 therethrough. The bolt 82 may be threadedly received into a plug 83 in the adjacent end of a cross brace 84 which is secured to, and extends between, the upper ends of the upright members 16 and 17. Alternatively, the threaded end of the bolt 82, which extends through the inner opening 79 in the upper portion 53, may be engaged in a conventional manner by a nut, not shown. The corresponding portions of the element 76 and upright member 16 may be similarly constructed whereby the distance between the armrest 18 and seat member 11 can be adjusted.

The handgrip 86 (FIGURES 5 and 7) is a short, cylindrical tube which is rigidly held against the lower surface of the seat member 11 adjacent to and parallel with the edge 49 thereof by the bolts 87.

Operation

With the crutch 10 assembled as described above, the armrest 18 is placed beneath the armpit on the side of the person 23 adjacent the incapacitated leg, and the thigh 22 of such person is rested upon the seat pad 19. The foot element 13 is adjusted so that, when the thigh 22 is on the seat pad 19 in a normal, seated position, the other leg of the person will be engageable with the floor or other supporting surface in a natural manner. Adjustment of the foot element 13 is effected by removing the bolt 37, moving the foot element 13 as required and then reinserting the bolt 37 through the leg member 12, foot element 13 and the lower ends of the upright members 16 and 17. In a similar manner, by removal and then replacement of the bolts 66 and 67, the position of the armrest 18 with respect to the upright members 16 and 17 can also be adjusted. The adjustment of the armrest 18 will be such that the person using the crutch 10 can manually grasp the handgrip 86 with his arm in a comfortable, pendent position. By this means, the user of the crutch 10 can easily and effectively control the position of the crutch and, at the same time, hold it firmly against his thigh 22 during walking or other movements.

Because the leg member 12 extends downwardly directly from the central portion of the seat member 11, a condition of correct balance always exists when the crutch 10 is being used for either standing in a substantially constant position or moving around. This gives the user of the crutch 10 a greater feeling of security and much greater freedom of use of the arm on the side of the body having the incapacitated leg.

Although a particular preferred embodiment of the invention has been disclosed in detail above for illustrative purposes, it will be understood that variations or modifications of such disclosure, which lie within the scope of the appended claims, are fully contemplated.

What is claimed is:

1. A crutch construction for a human, comprising: a substantially flat, rigid seat member; an elongated, substantially straight leg member and means rigidly securing the upper end of said leg member to said seat member so that it extends downwardly substantially perpendicularly from the central portion of said seat member; a foot element mounted upon the lower end of the leg member; a pair of elongated, similar upright members rigidly secured at corresponding points between their ends to said seat member near one edge thereof, said upright members having spaced parallel upper portions extending upwardly and substantially perpendicularly from said seat member, and said upright members having lower portions bent toward said leg member and secured near their lower ends to said leg member between the upper and lower ends thereof; a handgrip connected to and firmly held with respect to said seat member adjacent said edge of said seat member; and an armrest having spaced means connected to the upper ends of said upright members.

2. The structure of claim 1 wherein said foot element is a hollow, cylindrical tube; and including a plug member having a shank rigidly held in the lower end of said tube and an annular flange on the lower end of said shank, said flange being engaged with the lower end of said tube, the lower peripheral edge of said flange being rounded and said shank having an annular groove adjacent to said flange into which the adjacent, lower edge of said tube is offset.

3. A riding crutch for a human, comprising: a flat, rectangular and rigid seat member having a pair of spaced openings extending perpendicularly therethrough near one edge thereof; a seat pad mounted upon the upper surface of said seat member for supporting the upper thigh of a human without obstructing the openings in the seat mem-

ber; an elongated, tubular and substantially straight leg member having a pair of diametrically opposed transverse openings therethrough near the lower end thereof; a flanged socket secured to the lower surface of the seat member and having a vertical opening located directly below the central portion of said seat pad for snugly receiving and firmly holding the upper end of the leg member; an elongated foot element slidably and snugly received into the lower end of said leg member, said foot element having a plurality of uniformly spaced transverse openings, each opening being alignable with said pair of openings in the leg member; a resiliently flexible shoe mounted upon the lower end of said foot element; a pair of similar, tubular and upright members extending through the openings in said seat member, said upright members being substantially mirror images of each other, the upper portions of said upright members being parallel and extending substantially perpendicularly from said seat member, and the lower portions of said upright members curving toward said leg member, the lower ends of said lower portions having openings therethrough axially alignable with the openings through said leg member; screw means simultaneously extending through the openings in the lower ends of said upright members, the openings in said leg member and one of the openings through said foot element for rigidly holding them with respect to each other; screw means extending through said upright members and adjacent portions of said seat member for rigidly holding them with respect to each other; an armrest having a pair of parallel, spaced support elements extending in the same direction therefrom for snug slidable reception into the upper ends of said upright members; means defining a plurality of openings through said support elements and a pair of openings through each of the upper ends of said upright members, and pin means receivable through such openings for adjustably holding said armrest in selected positions with respect to said upright members; and a

gripping bar rigidly secured to the lower surface of said seat member adjacent to and parallel with said one edge thereof, whereby a human having his thigh resting upon said seat pad and said armrest in his armpit can comfortably and manually engage said gripping bar.

4. The structure of claim 3 wherein said foot element is a cylindrical tube and said shoe is an upwardly opening, cup-shaped member of resiliently flexible material; and including a plug member having a shank rigidly held in the lower end of said foot element and an annular flange on the lower end of said shank engaged with the lower end of said foot member, the lower peripheral edge of said flange being rounded and said shank having an annular groove adjacent to said flange into which the adjacent, lower edge of said foot element is offset.

5. The structure of claim 1 wherein said hand grip is an elongated, relatively stiff member secured to the lower side of said seat member adjacent to, and substantially parallel with, said one edge thereof.

6. The structure of claim 1 wherein said seat member has a pair of spaced, axially parallel openings therethrough near said one edge thereof, said upright members extending through said parallel openings and including means rigidly holding said upright members therein; wherein said hand grip is an elongated member secured to said seat member between said one edge thereof and said upright members; and including a seat pad on the said seat member above said central portion thereof.

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