Sept. 14, 1965 C. GOTTMAN 3,205,905

CRUTCHES

Filed March 1, 1963

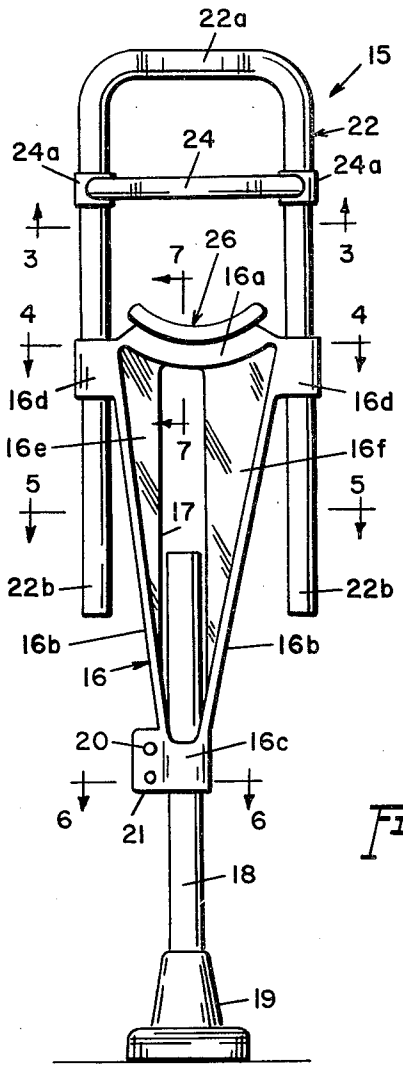

FIG. 1.

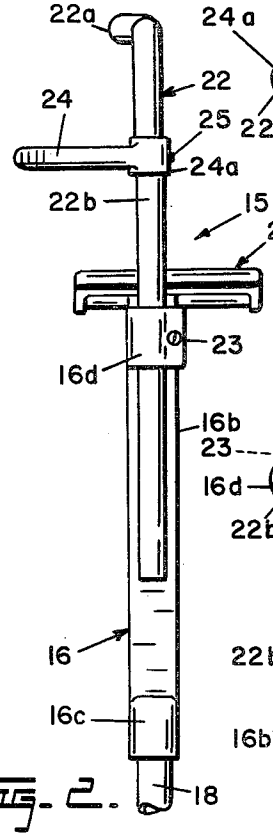

FIG. 2.

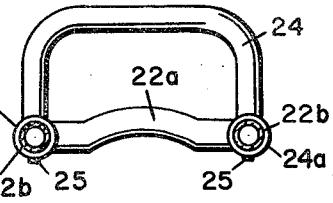

FIG. 3.

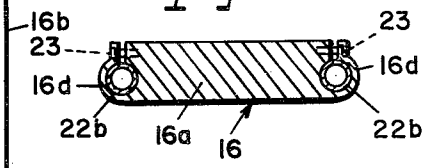

FIG. 4.

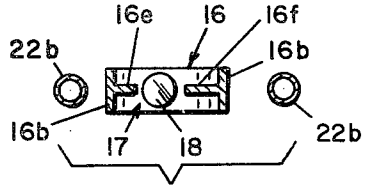

FIG. 5.

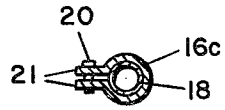

FIG. 6.

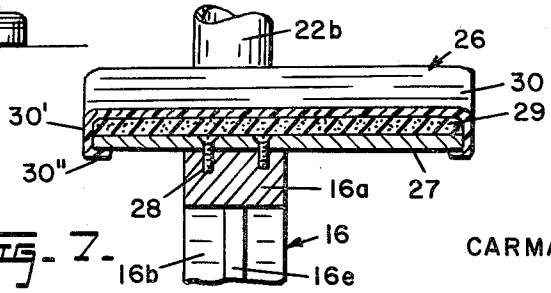

FIG. 7.

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CRUTCHES

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1 Claim. (Cl. 135—50)

This invention relates to new and useful improvements in crutches, and in particular the invention concerns itself with crutches of the type which provide a leg rest and constitute a prosthetic leg extension for below the knee amputees.

The knee crutch of the invention represents certain structural and functional improvements in the knee crutch disclosed in my earlier Patent No. 3,074,420, issued Jan. 22, 1963.

An important feature of the present invention resides in making the main body of the crutch in the form of a light-weight, sturdy casting to which other components of the crutch are removably and adjustably connected, such a casting serving to provide a rigid, dependable backbone, so to speak, for the crutch as a whole, which is not facilitated by crutches fabricated from simple tubular stock in accordance with conventional practice. Moreover, the casting, as an integral entity, includes clamping sleeves or bosses to adjustably receive the other crutch components such as the crutch leg member and means for stabilizing the crutch relative to the body of the user, such components being readily adjustable not only to suit users with different physical characteristics, but also to facilitate retraction of the crutch into a compact form when it is not in use.

Other objects, features and advantages of the invention will become aparent from the following description taken in conjunction with the accompanying drawings, wherein like characters of reference are used to designate like parts, and wherein:

FIGURE 1 is a front elevational view of one embodiment of the invention which is in the form of a knee crutch;

FIGURE 2 is a fragmentary side elevational view thereof;

FIGURE 3 is a sectional view, taken substantially in the plane of the line 3—3 in FIGURE 1;

FIGURE 4 is a sectional view, taken substantially in the plane of the line 4—4 in FIGURE 1;

FIGURE 5 is a sectional view, taken substantially in the plane of the line 5—5 in FIGURE 1;

FIGURE 6 is a sectional detail, taken substantially in the plane of the line 6—6 in FIGURE 1; and

FIGURE 7 is an enlarged, fragmentary sectional view, taken substantially in the plane of the line 7—7 in FIGURE 1.

Referring now to the accompanying drawings in detail, the knee crutch in accordance with the invention is designated generally by the reference numeral **15** and embodies in its construction a vertically elongated main body casting **16** which is formed integrally from any suitable light-weight material, as for example, aluminum, or the like. The upper portion of the casting **16** consists of a concave saddle **16*a*** which has a pair of downwardly convergent side portions **16*b*** extending from the ends thereof, the lower ends of these side portions uniting in a split clamping sleeve **16*c*** at the lower end of the casting. The upper end regions of the side portions **16*b*** are formed integrally with a pair of transversely spaced, split clamping bosses **16*d***, it being noted that the casting components **16*a***, **16*b***, **16*c*** and **16*d*** are substantially of the same width, while a pair of relatively narrow or thin reinforcing webs **16*e***, **16*f*** are formed integrally with the casting at the inside of the side portions **16*b*** and centrally thereof, as shown in FIGURE 5. The webs **16*e***, **16*f*** are spaced

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apart so as to provide a vertically elongated clearance or recess **17** in the casting, as will be apparent.

The split clamping sleeve **16*c*** at the lower end of the casting **16** slidably receives a tubular crutch leg member **18**, the upper end of which projects freely into the casting recess **17** while its lower end is equipped with a conventional ground engaging foot **19**. The leg member **18** is held in a selected, vertically adjusted position in the sleeve **16*c*** by a pair of clamping screws **20**, extending through a pair of flanges **21** with which the sleeve **16*c*** is provided at the opposite sides of its split, as shown in FIGURE 6.

The casting **16** also carries means for stabilizing the crutch with respect to the body of the user, such means including an inverted U-shaped, tubular rail **22** which comprises a bight portion **22*a*** and a pair of spaced parallel side portions **22*b***. The rail **22** extends upwardly from the casting **16** and has the side portions **22*b*** thereof slidably disposed in the aforementioned split bosses **16*d*** of the casting, whereby the rail **22** may be adjusted upwardly and downwardly relative to the casting. The rail is held in a selected position of adjustment by clamping screws **23** with which the split bosses **16*d*** are equipped, as is best shown in FIGURE 4. The bight portion **22*a*** of the rail **22** is forwardly arcuated or curved to fit the thigh of the user and provided below the bight portion **22*a*** is a hand grip **24** which has tubular end portions **24*a*** slidable along the side portions **22*b*** of the rail **22**. Thus, the position of the hand grip on the rail may be raised or lowered as desired, the hand grip being retained in a selected position by set screws **25** which extend through the portions **24*a*** to grip the rail portions **22*b***, as will be clearly apparent.

A leg rest, specifically a knee rest **26** is mounted on the saddle **16*a*** of the casting **16**, this rest comprising a rigid, convexoconcave plate **27** which is attached to the saddle by suitable screws **28**, as is best shown in FIGURE 7. A cushion pad of sponge rubber, or the like, **29** is placed on the plate **27** and a cover **30** is superposed on the pad **29**. The cover **30** is preferably made of plastic material and includes a downturned perimetric edge **30′** with an inturned lip **30″**. The material of the cover has sufficient resiliently flexible characteristics so that the perimetric edge **30′** with the lip **30″** may be spread to facilitate placing of the cover on the pad **29** and snapping of the lip **30″** under the perimetric edge portion of the plate **27** for holding the cover as well as the pad in position on the plate. Of course, the cover and the pad may be readily removed when replacement of either the cover or the pad is desired.

When the crutch is to be used, it is applied to the leg so that the knee of the user rests on the rest **26**, the bight portion **22*a*** of the rail **22** abuts the front of the user's thigh, and the hand grip **24** projects forwardly for convenient grasping by the user's hand. It will be noted that the rest **26** extends more rearwardly than forwardly from the saddle **16*a*** to properly support the user's knee, and it will be also noted that the vertical axis of the crutch leg member **18** is offset laterally to one side of the center of the rest **26**, that is, to the outside of the leg with which the crutch is used, so as to enhance the stability which the crutch affords. As such, the arrangement of the various components is particularly adapted for use of the crutch with one leg, for example, the right leg, but the crutch may be quickly and easily converted for use with the opposite leg, for example, the left leg, by simply reversing the position of the casting **16** relative to the rail **22** and also reversing the position of the rest **26** relative to the casting. When the crutch is not in use, it may be conveniently retracted to a compact form by sliding the hand grip **24** as close as possible to the bight portion **22*a***,

sliding the rail **22** downwardly in the bosses **16***d* of the casting **16** until the hand grip **24** is adjacent the rest **26**, and retracting the leg member **18** upwardly through the sleeve **16***c* into the recess **17** in the casting.

While in the foregoing there have been described and shown the preferred embodiments of the invention, various modifications may become apparent to those skilled in the art to which the invention relates. Accordingly, it is not desired to limit the invention to this disclosure, and various modifications and equivalents may be resorted to, falling within the spirit and scope of the invention as claimed.

What is claimed as new is:

A knee crutch, comprising in combination, a vertically elongated crutch body formed integrally by casting and comprising a transversely concave upper portion constituting a saddle for a user's knee, inner and outer downwardly convergent strap-like side portions extending downwardly from the ends of said saddle, a split clamping sleeve provided at the lower ends of said side portions, a pair of webs provided on opposing inner surfaces of said side portions and connected at their upper ends to the underside of said saddle, said webs being transversely spaced to provide therebetween a vertically elongated recess extending from said clamping sleeve to the underside of said saddle, and a pair of split bosses provided on the outer surfaces of said side portions at the upper ends of the latter, a vertical tubular leg vertically slidably adjustable in said clamping sleeve and receivable in said recess between said webs, a clamping screw in said split clamping sleeve locking said leg in an adjusted position, an inverted U-shaped stabilizing member having a forwardly curved thigh-fitting bight portion and a pair of parallel side pieces vertically slidably adjustable in said bosses,

clamping screws in said split bosses locking the side pieces of said stabilizing member in an adjusted position, a U-shaped hand grip provided at the ends thereof with a pair of tubular guides vertically slidably adjustable on the side pieces of said stabilizing member above said saddle, and set screws provided in said guides to engage said side pieces and lock said hand grip in an adjusted position, said knee saddle, said thigh-fitting bight portion and said hand grip being aligned in a vertical plane disposed transversely centrally between said side pieces of said stabilizing member, said vertical leg being straight and, together with said clamping sleeve, having its vertical axis offset laterally from said first mentioned vertical axis toward the outer side portion of said crutch body, whereby the crutch is gravitationally biased toward the inside thereof.

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