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(54) Leg support

(57) A leg support that can be mounted on (almost) any kind of seat (including a wheelchair), and is adjustable to support the leg at a wide range of places, and yet is light enough conveniently to be carried from one place to another has a seat portion, to be placed on the seat and an extensible leg support portion projecting (horizontally) from the seat portion. The support portion usually extends either to the left or to the right of some "centre" line, at the patient's choice depending on which leg is to be supported) and upon which the patient, while seated, can support the injured leg.

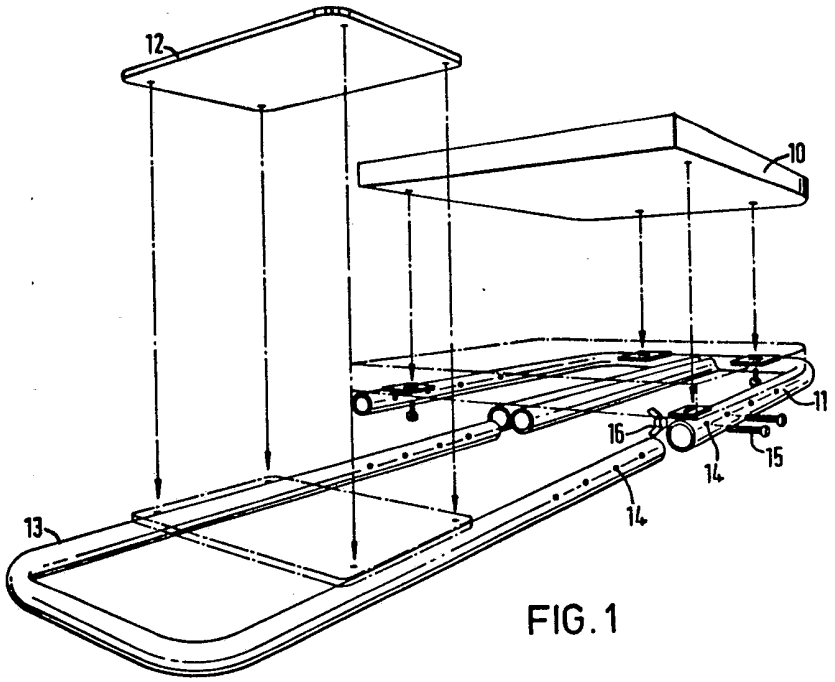

FIG. 1

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The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

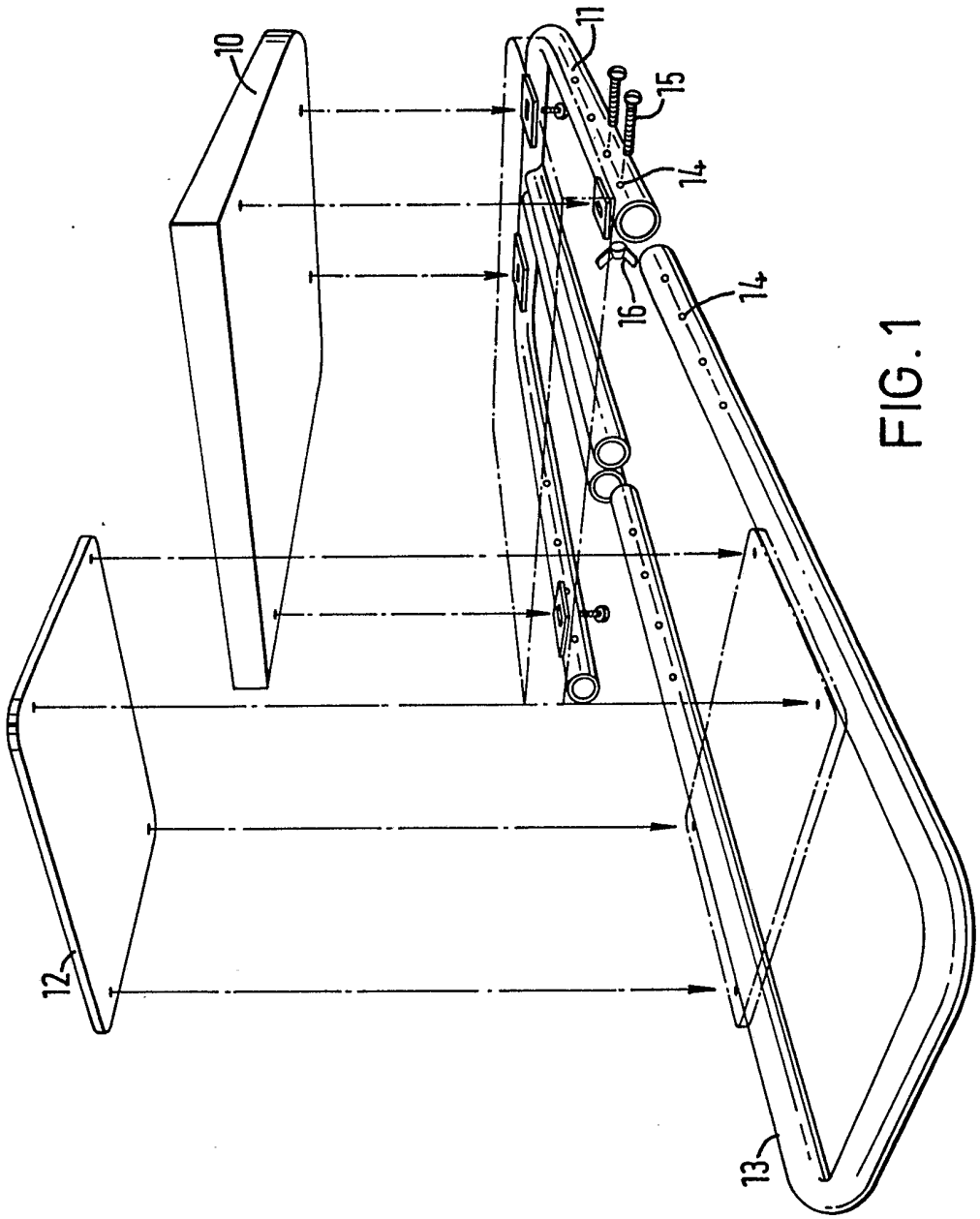

FIG. 1

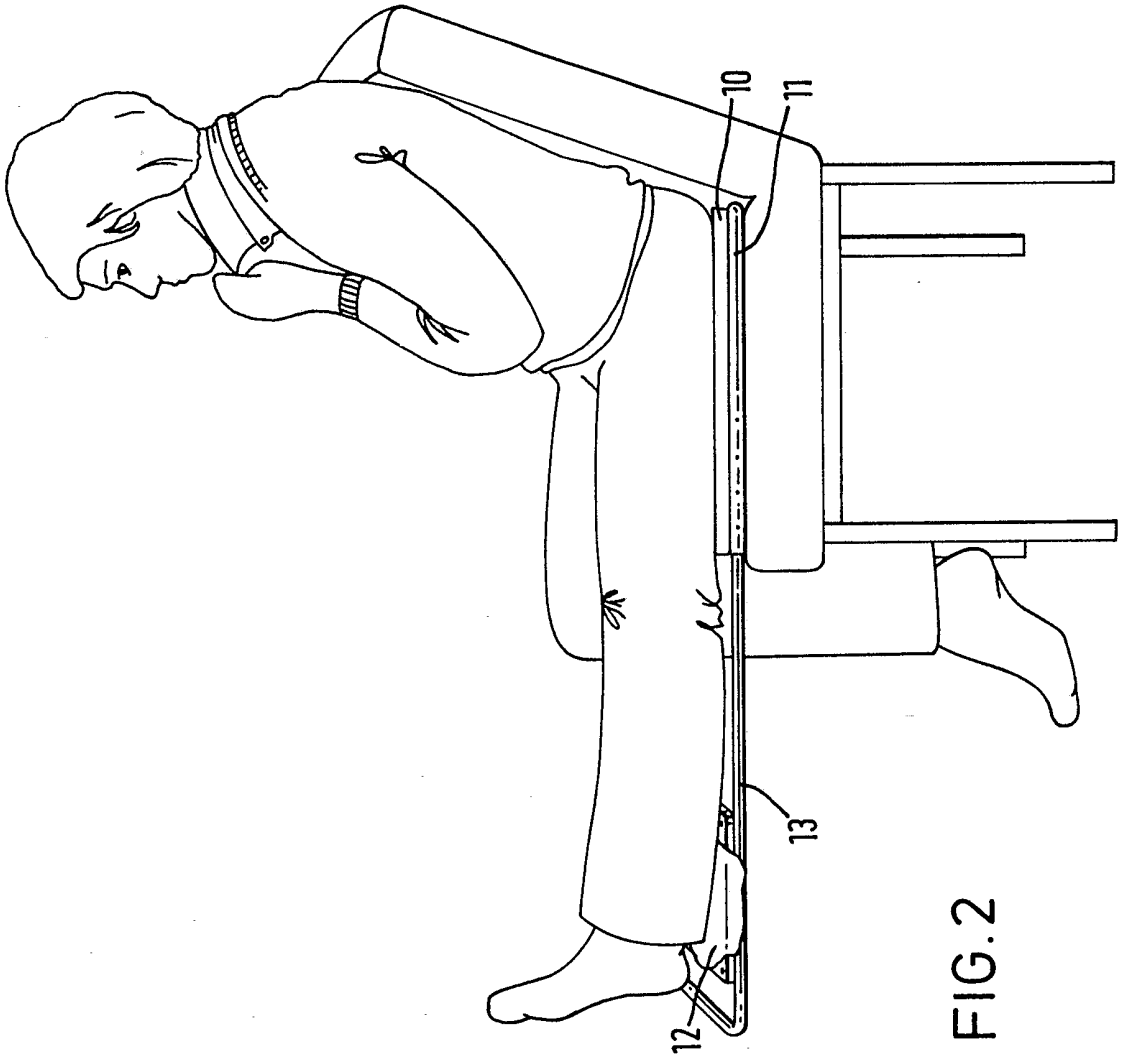

FIG.2

SPECIFICATION

Leg support

This invention relates to leg supports, and concerns in particular a support for a human leg, which support is adapted to be mounted on the chair to be sat on by the human.

There are many reasons why a person might need to support one leg in a generally horizontal position. For example, some illnesses require a leg to be so supported—not simply because of physical damage but also in the case of varicose veins, arthritis and muscle and ligament problems.

Perhaps more commonly, however, a person will break a leg. In many cases the fracture will only mend if the relevant part of the leg is immobilised, and it is current practice to achieve this by encasing so much of the leg as is necessary in plaster of paris. Unfortunately, the immediate result is a "limb" that is ungainly and heavy—one that needs some form of support, especially when the person is sitting down.

This invention relates to the provision of a novel form of leg support.

Various types of leg support are presently in use, or have been proposed. By and large, however, they are frequently cumbersome, inflexible, costly and ineffective. Indeed, sometimes they can cause more damage. Classically, the present-day support fall into two main groups. First, there is the "modified" wheelchair variety: some wheelchairs are manufactured with attachments to support legs in a horizontal position. This has three major disadvantages. Because of the small number of wheelchairs manufactured with leg support capability, they are very costly, being made in small batch quantities by larger companies with consequently high overheads. Then, hospitals etc. currently need to carry both types of wheelchair in stock. Finally, wheelchairs are not easily portable, are cumbersome, cannot mount stairs, and have frequent space and access problems.

Secondly, there is the stool or pouff type: these are frequently used to support the lower leg when sitting down. These, too, have three disadvantages. One is that the downwards pressure from the weight of the leg on an unsupported knee joint will tend to lock the knee. This causes problems in physiotherapy when trying to re-mobilise the patient. The second is that whenever the patient wishes to sit down, a stool or pouff the right height needs to be available. This can be quite a problem where the patient uses several rooms in a house. Finally, when the patient wishes to stand up, the supported leg must be lifted to remove the stool, risking the leg crashing to the floor.

The invention seeks to do away with all these difficulties by providing a completely new type of leg support that can be mounted on (almost) any kind of seat (including a wheelchair), and is adjustable to support the leg at a wide range of places, and yet is light enough conveniently to be carried from one place to another (and, indeed, can at a pinch be used as a crutch to aid the patient in so moving). To do this the invention proposes a leg support which has a seat portion, to be placed on the seat (of a wheelchair, say) and then sat upon by the patient, and an extensible leg support portion projecting (horizontally) from the seat portion (preferably either to the left or to the right of some "centre" line, at the patient's choice depending on which leg is to be supported) and upon which the patient, while seated, can support the injured leg.

In one aspect, therefore, the invention provides a leg support, for use with a chair (or other object for sitting on) upon which the patient having the injured leg needing support will sit, which support comprises:

a seat portion adapted in use to be placed on the chair and sat on; and

a leg support portion adjustably mounted upon the seat portion so as to project extensibly therefrom generally in the plane thereof, the leg support portion being adapted in use to have the injured leg rested thereon as the patient sits on the seat portion on the chair.

The leg support of the invention is in essence a seat portion on which there is extensibly and adjustably mounted a leg support portion. Each portion is most conveniently in two parts. The seat portion is made up of a seat proper (on which the patient actually sits) and a seat frame forming a mounting for the leg support portion (positioned under and affixed to the seat proper). The leg support portion is made up of the leg support proper (on which the patient's leg is actually to rest) and an extension member co-operating with the mounting beneath the seat proper (which extension member is positioned under and affixed to the leg support proper). These four components may take a number of forms. Thus:—

The seat proper most conveniently consists of:

i) a firm base made from a rigid material, such as fibreboard or plywood (this is required firstly for support of the patient's weight and secondly to allow the seat frame to be securely attached to the seat proper);

ii) foam or other upholstery medium for the user's comfort; and

iii) a covering material (a whole variety of covering materials exist—PVC is recommended for ease of cleaning, but as in any seat covering individual tastes can be catered for).

The seat frame, forming the mounting for the leg support portion, most conveniently comprises: a pair of parallel but spaced tubes each attached to the base of the seat proper

(very preferably the two tubes are in fact one, bent into a U shape). The tube material is metal tubing (or other material) of sufficient strength. The frame must be securely connectable to the seat. It can either be screwed or bolted on (on one embodiment, small plates are welded to the frame through which it can be bolted into fixed nuts inserted into the seat base). This allows the seat to be removed or replaced easily. However, the seat proper can be connected to the seat frame in other ways—such as by rivets or spring clips.

The mounting must be such that the leg support portion—more specifically, the extensible member part thereof—can be adjustably mounted thereon so as to be extensible—that is to say, can be mounted either close to or far away from the seat portion. In the case of the preferred tubes this is achieved (as is perhaps made clearer hereinafter) by having the leg support portion's extension member slide in and out of the tubes but be securable therewith at one of a number of positions (by bolts passing through aligned holes).

There need be only one mounting—one pair of tubes, say—which can be located either centrally of the seat proper or to left or right of centre. However, it is most preferably if there be two mountains—or, rather, one mounting having two locations at which the leg support portion's extension member can be mounted, one on the left and one on the right (for use depending on which leg is the injured one). In particular, it is preferred if the mounting be *two* pairs of tubes—especially two U-shaped tubes—mounted side by side with the "centre" tubes actually touching, so as to form a generally W shape. By arranging that one tube pair or U is on the left, and the other is on the right, so the leg support can be used for either an injured left leg or an injured right leg. Indeed, by using *two* separate leg support portions, each with its own extension member, the leg support may be arranged to seat a patient with both legs injured.

In an especially preferred embodiment using metal U-tubes, the two are welded together for strength.

The leg support portion's extension member also most preferably comprises: two spaced parallel tubes, the spacing matching that of the mounting's pair of tubes (or the preferred U-tube). Indeed, most conveniently this extension member tube pair is itself a U-tube.

The extension member is required to be so adjustably mountable on the mounting that it is extensible in relation thereto (the reason for this, as is mentioned hereinafter, is to allow the position of the leg support proper carried by the extension member to be adjusted to support the injured leg in the appropriate positions along its length). Clearly, this extensibility is most advantageously achieved by having the extension member's tubing external diameter slightly less than the mounting's tubing internal diameter, and then sliding the one into (and out of) the other, as in a trombone (which the two U-tubes vaguely resemble). And—as noted above—the adjustability can become "fixed" by providing each tube with matching holes (along its length) that can be aligned so that a locking pin or bolt can be inserted therethrough to prevent sliding. Alternatively, the sliding extension member tubing can be held in position by spring buttons mounted on itself locating into appropriate holes in the seat frame tubing.

Though as so far described it may be inferred that the leg support portion is wholly in the plane of the seat portion (so, in use, it is horizontal), this need not be the case. It may be desirable, for example, for the leg support portion—particularly for the extension member—to be slightly angled normal to the seat plane so that in use it points downwardly therefrom. This may be orthopaedically more desirably for the patient, or simply more comfortably. Furthermore, while this slight angle may be fixed—a tube extension member may, for instance, simply be "bent" 10 or 20 degrees down from the (in use) horizontal—it may be arranged to be adjustable by providing the extension member with some sort of fixable hinge system that can be utilized to set the extension member angle at that one of a number of positions best suited to the patient's leg's needs.

The leg support proper is, in essence: merely some firm platform—a form of board—affixed to the extension member and on which the leg rests. Conveniently the board is a simple medium-density fibreboard piece, which can be upholstered (as is the seat proper, if desired). It can be affixed "permanently"—that is, by screws, rivets, or some other similar fixing method), or it can be affixed in a manner permitting it the more easily to be removed—or even moved along the extension member—for example, by spring clips, so that it can slide to the required position. Moreover, there may be more than one leg support proper if required.

In use, the leg support of the invention is placed with its seat portion on the chair seat and its leg support portion projecting therefrom; the leg support will "pivot" on the edge of the chair. The patient then simply sits down—and his or her weight on the seat portion holds the whole support firmly in position so that the injured leg can be rested on the leg support portion. When the patient wishes to move, and begins to stand up, the whole leg support essentially pivots on the edge of the chair, and the leg support portion lowers slowly until it reaches the floor. The patient is in control all the time, and the leg is supported on its downward journey. When the foot reaches the floor the patient can use the leg support as a crutch to assist balance and

carry the leg support to the patient's new location.

The leg support can be used to carry a patient with, for example, a broken leg which must be kept straight. The patient can sit on the seat, with leg outstretched and can be carried by two people holding either side of the seat and the extension member. This could be especially useful where no wheelchairs are available, or where stairs need to be negotiated, and the patient is unable to support himself.

As will be apparent from the foregoing, the invention, in its preferred aspects, is a leg support that comprises

a seat proper;

two U-tubes welded side by side to form a W-shaped frame (mounting) which is conveniently the same overall size as the seat proper, and which is screwed to the seat proper;

at least one U-tube extension member made from smaller dimension tubing that the W-frame, so that it can slide into either the left or right hand side of the W-frame tubing rather like a trombone piece, securing the U-tube in several positions depending upon the length of the patient's leg; and

a leg support proper made from a board connected across the legs of the U-tube to support the leg.

The basic principle of the invention is that the weight of the patient's upper body sitting on the seat and the attached W-frame is sufficiently greater than the weight of the patient's leg, including a plaster cast is required, that it will hold the extension U-tube in a horizontal position, level with the seat frame whilst supporting that leg.

One embodiment of the invention is now described, though by way of illustration only, with reference to the accompanying Drawings, in which.

Figure 1 shows a perspective, exploded view of a leg support of the invention; and

Figure is a sketch showing the leg support of Fig. 1 in actual use.

The leg support of Fig. 1 comprises four main parts. The seat portion is made up of a seat proper (10) affixed by screws and mounting plates to a frame (mounting 11), while the leg support portion is made of a support proper (12) affixed by screws (not shown) to an extensive member (13).

Both the seat proper 10 and the support proper 12 are shaped plywood upholstered with foam padding and a cloth covering, and both the frame 11 and the extension member 13 are chromed steel tubing—the latter of an external diameter that is a sliding fit into the former.

The frame 11 is W-shaped—that is, it is *two* U-shaped sections welded together. The extension member is U-shaped—and its cross-U dimension is such that it can slide in and out of either part of Us in the W. The frame and extension member have co-operating holes (as 14) drilled therein through which can be passed bolts (as 15), done up with wing nuts (as 16) to secure the extension in the frame.

As will be apparent, especially from Fig. 2, in use the leg support is placed on a chair, with the extension member 13 (and support proper 12) projecting horizontally therefrom), and sat on by the patient. The patient's weight keeps the combination stable. The injured leg is stretched out resting on the support proper, and the extension member is adjusted until the support is in the correct place.

It will be clear that the invention, using the patient's own body weight to support the injured leg in a horizontal position, overcomes the existing problems in a simple and very effective manner.

CLAIMS

1. A leg support, for use with a chair (or other object for sitting on) upon which the patient having an injured leg needing support will sit, which support comprises:

a seat portion adapted in use to be placed on the chair and sat on; and

a leg support portion adjustably mounted upon the seat portion so as to project extensibly therefrom generally in the plane thereof, the leg support portion being adapted in use to have the injured leg rested thereon as the patient sits on the seat portion on the chair.

2. A leg support as claimed in Claim 1, wherein the seat portion is made up of a seat proper (on which the patient actually sits) and a seat frame forming a mounting for the leg support portion (positioned under and affixed to the seat proper), and the leg support portion is made up of the leg support proper (on which the patient's leg is actually to rest) and an extension member co-operating with the mounting beneath the seat proper (which extension member is positioned under and affixed to the leg support proper).

3. A leg support as claimed in Claim 2, wherein the seat proper consists of: a firm base made from a rigid material; and upholstery medium; and a covering material.

4. A leg support as claimed in either of Claims 2 and 3, wherein the seat frame forming the mounting for the leg support portion comprises a pair of parallel but spaced-tubes each attached to the base of the seat proper.

5. A leg support as claimed in Claim 4, wherein the two tubes are in fact one, bent into a U shape.

6. A leg support as claimed in any of Claims 2 to 5, wherein, in the case of the frame being a pair of tubes, adjustibility is achieved by having the leg support portion's extension member slide in and out of the tubes but be securable therewith at one of a number of positions.

7. A leg support as claimed in any of

Claims 2 to 6, wherein there is one mounting having two locations at which the leg support portion's extension member can be mounted, one on the left and one on the right.

8. A leg support as claimed in Claim 7, wherein the mounting is *two* pairs of U-shaped tubes mounted side by side with the "centre" tubes actually touching, so as to form a generally W shape.

9. A leg support as claimed in any of Claims 2 to 8, wherein the mounting is a pair of spaced but parallel tubes, and the leg support portion's extension member comprises a like pair of spaced parallel tubes, the spacing matching that of the mounting's pair of tubes but the extension member's tubing external diameter being slightly less than the mounting's tubing internal diameter, so that the one may be slid into (and out of) the other.

10. A leg support as claimed in Claim 9, wherein the extension member tube pair is itself a U-tube.

11. A leg support as claimed in any of Claims 2 to 10, wherein the leg support proper is a firm platform affixed to the extension member.

12. A leg support as claimed in any of the preceding Claims and substantially as described hereinbefore.

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