United States Patent [19]

Bliss

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[45] **Sept. 30, 1975**

[54] **ADJUSTABLE LIMB SUPPORT**

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[52] **U.S. Cl.** ..... **128/83;** 128/83 X

[51] **Int. Cl.**[2] **A61F 5/04**

[58] **Field of Search** 128/83, 84, 82; 269/328; 297/423, 438

[56] **References Cited**

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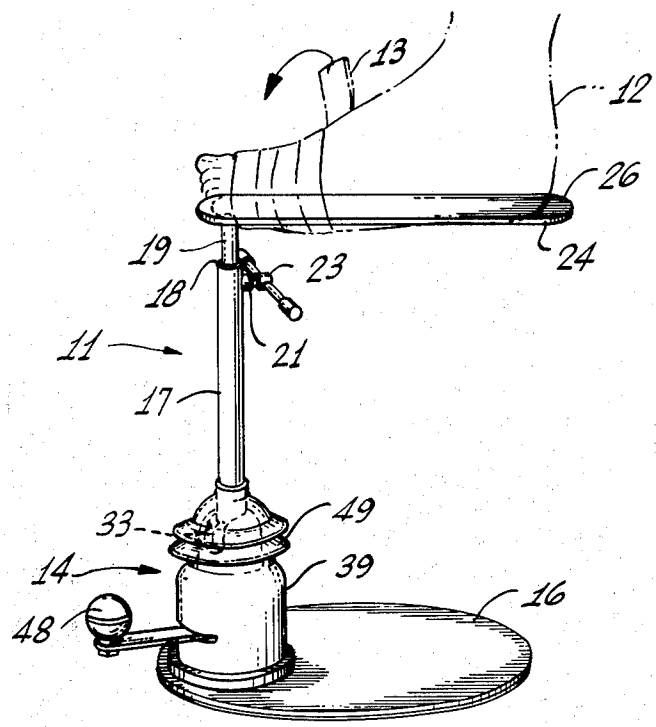
[57] **ABSTRACT**

A device for the support of a patient's limb while preparing a cast, including an adjustable stand and an elongated limb support. The limb support has an upper surface, a lower surface and one end, which are unobstructed by the stand so that a cast can be prepared about both the limb and the elongated limb support. Following preparation of the cast, the limb support is removed from between the cast and the limb. The stand is vertically adjustable and tiltable so that the limb support can be adjusted to maintain the limb in a desired position.

1 Claim, 3 Drawing Figures



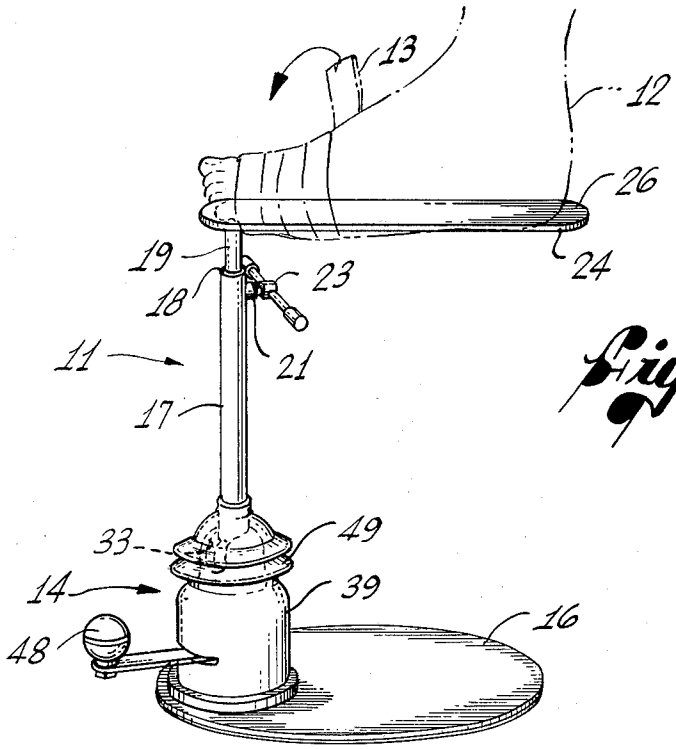


Fig.1

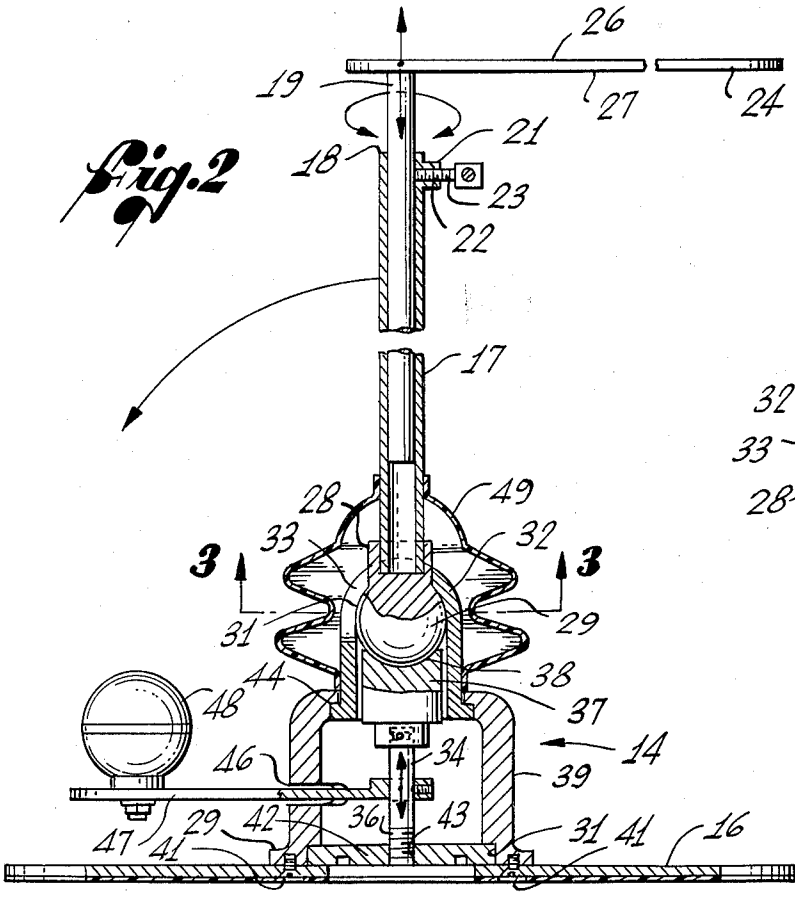


Fig.2

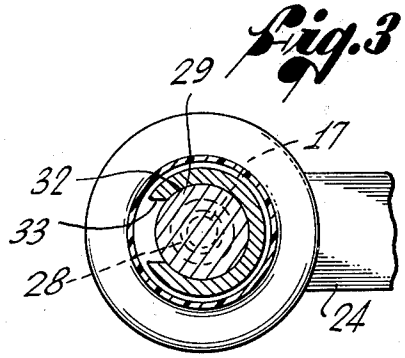


Fig.3

ADJUSTABLE LIMB SUPPORT

BACKGROUND OF THE INVENTION

This invention relates to an improved support or rest for maintaining a patient's limb in a desired adjusted position and more particularly to a limb support for use in supporting a limb while a cast is applied thereto.

In preparing a cast for a fractured arm or leg, it is essential that the limb be held in a fixed position while the cast is applied. This procedure normally requires two people, one person to prepare the cast and an assistant to hold the limb while the cast is applied. It would be advantageous to mechanically support the limb during this procedure since the assistant would be free to assist directly in the preparation of the cast or would be free for other duties. In addition, once adjusted, the mechanical support would not move thereby avoiding a certain amount of patient discomfort caused by movement of the fractured limb.

A variety of limb support devices are known in the art. These devices generally consist of an adjustable support stand and a limb support carried by the stand. These devices are not designed and constructed for supporting a limb while a cast is applied to the support limb. The limb support elements disclosed by the prior art devices would interfere with the cast preparation and it would be necessary in most cases to move the limb out of the support when actually applying the cast. Consequently, an assistant would still be required to support the limb while it is out of the support. Moreover movement of the limb while applying the cast is highly undesirable.

The present invention overcomes these deficiencies by providing a limb support, a portion of which is designed to be incorporated within the cast along with the limb and which is removed from the cast when the casting preparation is complete thereby eliminating any unnecessary limb movement and relieving patient discomfort.

SUMMARY OF THE INVENTION

The present invention resides in an adjustable support for carrying a limb, such as an arm or leg, and maintaining the limb in an adjusted position while a cast is applied to the limb. Once positioned by the limb support, the limb need not be moved. The cast is applied over the limb and the limb support carrying the limb. The limb support is subsequently removed from the cast through an opening conventionally provided at one end of the finished cast.

More particularly the limb support of the present invention comprises an adjustable stand, and an elongated limb supporting platform carried by the stand. The platform includes a supporting surface and an opposite surface which is attached to the stand adjacent one end of the elongated platform. In this manner the supporting surface and a substantial portion of the opposite surface are unrestricted by the stand so that the platform can be removed from the cast by sliding the platform through an open end of the cast. The stand is vertically adjustable and tiltable so that the limb support platform can be adjusted to any desired limb supporting position.

Other aspects and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view, partially broken away, of the limb support of the present invention illustrated in connection with supporting a patient's foot in position while a cast is applied to the patient's lower leg;

FIG. **2** is an enlarged scale side view, partially in section and having portions thereof broken away for compactness of illustration; and

FIG. **3** is an enlarged scale sectional view taken through line **33** of FIG. **2.**

DETAILED DESCRIPTION OF THE INVENTION

As illustrated by the drawings, the invention resides in an adjustable limb support, shown generally as **11** for maintaining the limb of the patient, such as the patient's foot **12,** in an adjusted, fixed position while the procedure of preparing a cast for the limb is carried out. As illustrated, a suitable protective layer **13** such as gauze or elastic material is wrapped around the limb area to which the cast is to be applied while the limb is maintained by the support **11** in an adjusted fixed position. Following application of the protective layer, the cast material, such as plaster of paris or other suitable casting composition well known in the art, is applied over the wrapped portion of the limb. The support **11** is subsequently withdrawn from between the wrapping material and the limb when the casting material has set up sufficiently.

As is more specifically illustrated in FIGS. **1** and **2,** the limb support **11** includes an adjustable stand, shown generally as **14.** The stand comprises a base **16,** a tubular post **17** tiltingly connected at one end to the base and having an opposite, open end **18.** An extendable rod **19** is slidingly carried in the post for adjusting the height of the stand. A boss **21** is carried on the post adjacent the open end **18** and a threaded passage **22** extends through the boss and one wall of the post. An adjusting bolt **23** is threadably carried in the passage for engagement with the rod to lock the rod in a position within the post.

An elongated support platform **24** is affixed to an end of the rod **19** extending beyond the open end **18** of the post **17.** The support platform is provided with a support surface **26** and a lower surface **27** with the longitudinal dimension of the surfaces being greater than the transverse dimension thereof.

The point of attachment of the platform **24** and the rod **19** is located on the lower surface **27** adjacent one end of the platform so that a substantial portion of the platform extends normal to the rod. In this manner, the upper surface **26** and a substantial portion of the lower surface are unrestricted by the attachment of the rod to the platform so that the platform can be removed from between the support limb **12** and the protective layer **13.**

As mentioned, the post **17** is tiltingly connected to the base **16.** This manner of attachment allows for the adjustment of the support surface **26** to a desired position with respect to the horizontal plane. In the preferred embodiment the post is adapted for conventional ball and socket connection with the base.

As is more specifically illustrated in FIGS. **2** and **3,** the post **17** is received in the open end of a mounting cylinder **25** which is attached at its opposite end to a ball **29** adjustably contained within a socket **31.** The socket is formed by a converging inner surface of an in-

verted cup **32** having a slot **33** for extension therethrough of the mounting cylinder and post, an upstanding shaft **34** having a threaded lower end **36** and an enlarged head **37** extending into the mouth portion of the inverted cup and having an upper recessed surface **38** adapted to engage a portion of the ball.

An open ended cylindrical hub **39** is mounted on the base by bolts **41.** The inner surface of the hub adjacent the lower opening is recessed for clamping engaging edge portions of a plate **42.** The plate has a centrally located threaded passage **43** for carrying the threaded end **36** of the shaft **34** for raising and lowering the head **37** incident to rotation of the shaft. The inner surface of the hub adjacent the upper opening is likewise recessed and receives an annular flange **44** formed at the cup mouth. The cup **32,** which is otherwise freely movable in the upper opening, is restrained by the clamping action of the flange **44** against the recessed area responsive to the upward movement of the head **37** and ball **29.** A slot **46** is formed in one wall of the hub to permit the extension therethrough of a lever **47** which is affixed at one end to the shaft and which carries a knob **48** at the opposite, extending end for rotating the shaft to raise or lower the head. A flexible cuff **49** is provided about the ball and socket mechanism.

In operation, a patient, having a lower leg fracture, for example, is seated on the end of an examination table with the fractured leg extending downwardly. The support **11** is positioned beneath the foot with the support surface **26** of the elongated platform **24** in substantial alignment with the bottom of the patient's foot. The vertical adjustment bolt **23** is turned to release it from engagement with the rod **19** so that the rod can be moved upwardly in the post **17** to bring the upper surface of the support platform into contact with the bottom of the foot. If necessary, the rod can be rotated about its longitudinal axis to complete alignment of the support platform and the patient's foot. When the vertical height adjustment is complete, the vertical adjustment bolt is rotated in the opposite direction to lock the rod in position. If it is desired to adjust the plane of the upper surface of the support platform, the upstanding shaft **34** is rotated by lever **47** to move the head **37** downwardly to release the ball **29** and the cup **32.** The post **17** is tilted into the desired position whereupon the shaft is rotated in the opposite direction moving the head upwardly locking the ball and cup as previously described.

Once adjusted in the foregoing manner, the foot supported on the upper surface **26** of the support platform **24** is maintained in the desired position while the cast is prepared. In preparing the cast, the protective layer **13** is applied, such as by wrapping an elastic bandage around the foot and ankle area beginning in the area of the toes. As illustrated the protective material is applied around both the foot and the support platform. When the wrapping is completed, the cast material is applied over the wrapped area and allowed to harden. The platform is removed from the cast by sliding the limb support in a direction along the longitudinal axis of the support platform away from the point of attachment thereof to the rod. The toe area of the cast is normally left open and this provides a convenient point of egress of the support platform from the cast.

While the device of the present invention has been described in connection with supporting a foot during the preparation of a leg cast, it should be clear that the device is equally as effective for supporting a portion of the patient's leg or arm. It is essential in any casting procedure using the device of the present invention that the opening of the cast be located substantially at the point where the support platform **24** and the rod **19** are joined so that the support platform can be moved in a longitudinal direction towards its free end for removal of the support platform from the cast.

It will be evident that, while specific embodiments of the invention have been illustrated and described, various modifications and changes may be made without departing from the spirit and scope of the invention.

I claim:

1. In a method for aplying a cast to a patient's limb including the steps of wrapping the limb with a protective underlayer and applying hardenable casting material thereover, the improvement comprising;

supporting at least a portion of said limb on an elongated platform carried by a stand adjacent one end of said platform, said platform having an upper support surface and a lower surface, said platform being connected to said stand at a point on said lower surface adjacent one end of said platform so that said lower surface is unrestricted between the point of connection with said stand and the opposite end of said platform;

placing a layer of protective material about said limb, including placing said protective material about that portion of said limb supported by said platform and about said unrestricted lower surface of said platform, said protective material being provided with an opening adjacent the point of connection of said platform and said stand;

applying a layer of hardenable casting material over said protective material and allowing said casting material to harden; and

removing said platform from between said limb and said cast by withdrawing said elongated platform through said opening in said cast.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,908,643
DATED : Sept. 30, 1975
INVENTOR(S) : Russell Clark Bliss

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

Column 2, line 11, "33" should be -- 3-3 --.

Column 4, line 27, "aplying" should be -- applying --.

Signed and Sealed this

second Day of March 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks