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PLASTER CAST

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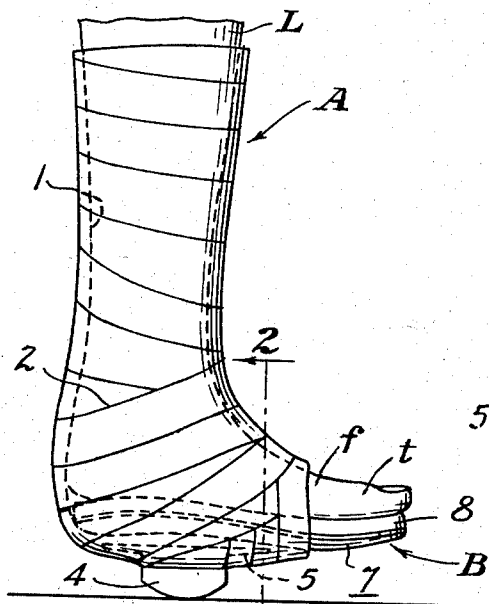


Fig. 1

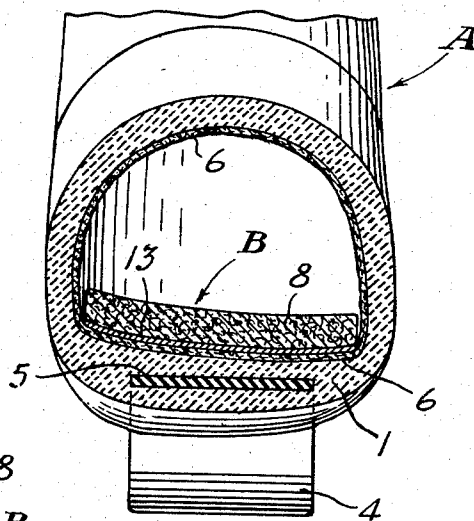


Fig. 2

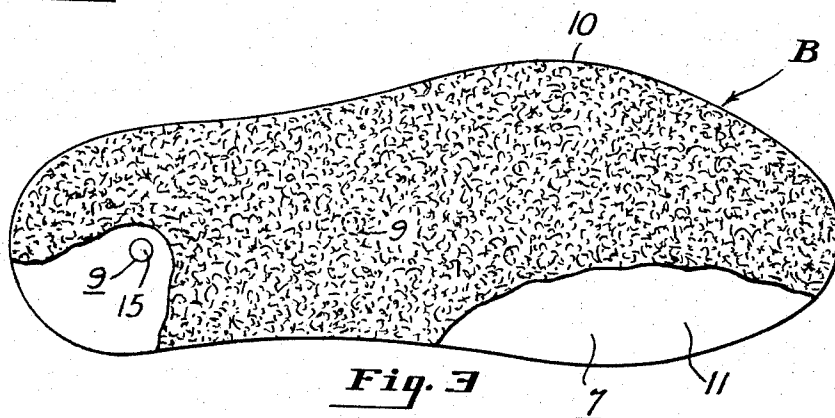


Fig. 3

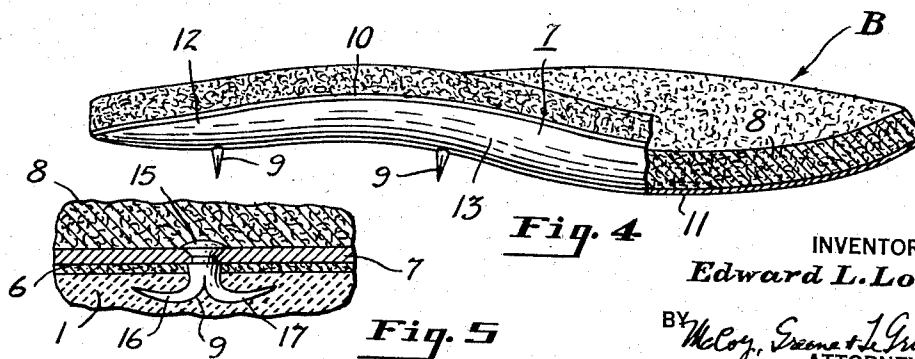


Fig. 4

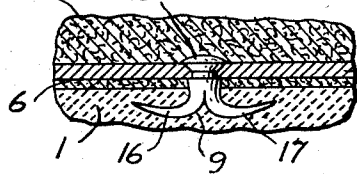


Fig. 5

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PLASTER CAST

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3 Claims. (Cl. 128—83)

The present invention relates to a rigid footpiece for injured persons and more particularly to a plaster cast or the like having a rigid footpiece shaped to conform to the bottom of the injured person's foot.

Heretofore, persons with broken bones in the foot have been unable to return to work promptly and have been required to stay off their feet for long periods of time even when the foot was in a plaster cast. Casts which prevented movement of the foot were too heavy to be practical or tended to break near the toes if the extra weight were not present.

According to the present invention, a rigid footpiece is provided which is shaped to conform to the bottom of the foot so that the weight is evenly distributed throughout the length and width of the foot, avoiding the concentration of weight on the ball and heel of the foot which tends to move the broken bones of the foot. This footpiece may be rigidly mounted in a plaster walking cast or, in the case of a broken toe or a broken metatarsal bone, may be inserted into an ordinary over-size shoe. The footpiece may be made of a rigid deformable metal or may be a rigid plastic molded to conform to the foot. A cushioning layer of felt, sponge rubber, or other suitable material may be mounted above the rigid portion of the footpiece and may in some instances be employed to support the arch of the foot.

An object of the invention is to provide a simple inexpensive means for preventing the application of substantial forces to the leg and foot bones of an injured person which would interfere with the proper knitting of broken bones.

A further object of the invention is to provide a simple means for protecting a broken foot which permits the injured person to return to work in a minimum period of time.

Another object of the invention is to provide a simple, inexpensive, plaster, walking cast or light weight which is comfortable and affords maximum protection to broken bones.

Other objects, uses and advantages of the present invention will become apparent to those skilled in the art from the following description and claims, and from the drawings, in which:

Figure 1 is a fragmentary side elevational view on a reduced scale showing the plaster cast of the present invention in place on a person's leg;

Figure 2 is a fragmentary vertical sectional view with the leg removed, taken substantially on the line 2—2 of Fig. 1 and on a larger scale;

Figure 3 is a top plan view of the footpiece employed in the cast of Fig. 1 on a larger scale with a portion of the cotton insole broken away;

Figure 4 is a side elevational view of the footpiece of Fig. 3 on the same scale with parts broken away and shown in longitudinal cross section; and

Figure 5 is a fragmentary vertical sectional view of the cast of Figs. 1 and 2 on a larger scale showing how the footpiece is rigidly mounted in the cast.

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Referring more particularly to the drawings, in which like parts are identified by the same numerals throughout the several views, Figs. 1 and 2 show a plaster cast A made according to the present invention and mounted on a person's broken leg L and foot f, said person's toes t projecting out of the cast. The cast A has a removable footpiece B which engages the bottom of the foot F to provide a comfortable support therefor and which extends substantially to the front of the toes t.

The cast A may be formed in the conventional manner using splints and/or roll bandages impregnated with plaster of Paris, but the footpiece B is held against the bottom of the foot during the forming of the cast. The cast A has a fabric-reinforced plaster body 1 enclosing the leg, which conforms to the shape of the leg L and foot f, and to the shape of the footpiece B, the bandages 2 being visible at the outer surface of said plaster body 1.

A conventional rubber heel may be provided to assist in mobilization of the patient or person wearing the cast. Such a heel may, for example, be of the general type disclosed in U. S. Patent No. 2,634,723.

As herein shown, the cast A has a one-piece molded rubber heel 4 of the type shown in Patent No. 2,634,723, with forwardly and rearwardly projecting flanges 5 which facilitate mounting of the heel on the bottom portion of the cast.

As herein shown, a thin cotton layer 6 completely covers the inside surface of the plaster layer 1 and engages the leg L and the foot f. The metal sole 7 of the footpiece B rests on a portion of the layer 6 below the foot, but it will be apparent that this portion of the layer 6 may be removed, if desired. A thick insole layer 8 of felt, cotton, or other suitable padding of uniform thickness, is bonded to the top of the sole 7 to provide a soft cushion for engaging the bottom of the foot f.

A plurality of split pins or rivets 9 may be provided on the sole 7 to prevent movement of the footpiece in the cast. As herein shown, two pins 9 are provided, one being located at the center of the heel portion 12 and the other being located near the center of the arched portion 13. Each pin 9 has a peened head 15 and leg portions 16 and 17, which may be bent like a cotter pin to hold the footpiece in place. Each pin 9 is riveted to and rigidly mounted on a metal sole 7 and initially projects perpendicular to the sole, as shown in Fig. 4.

The sole 7 may be made of any suitable material but preferably is made of a non-corrosive metal, such as aluminum or an aluminum alloy, which may be hammered to the exact shape of the foot. The sole 7 is cut like a shoe sole to provide a marginal edge 10 that conforms to the outline of the foot, a widened front portion 11 below the ball and toes of the foot, a heel portion 12 of reduced width below the heel of the foot, and an intermediate arched portion 13 that supports the arch of the foot. The layers 7 and 8 are shaped like a shoe sole so as to conform to the shape of the bottom of the foot f as is apparent from the drawings. In some instances the padding layer 8 may be shaped to provide an arch support, but it is preferable to form the rigid layer 7 to conform almost exactly to the shape of the foot so that the layer 8 may have a uniform thickness.

The heel 4 has a bottom ground engaging surface which is curved forwardly and rearwardly as indicated in Fig. 1 to permit a rocking movement of the cast in the direction of its movement during normal use. The footpiece B of the present invention does not interfere in any way with mounting of the conventional walking heel on the cast and does not substantially increase the work required to apply the cast to the leg and foot. A supply of footpieces of different sizes may be maintained at the hospital so that the proper size may be provided for any

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foot. However, best results are obtained when each footpiece is hammered to the exact shape of the foot.

During the application of the plaster cast the footpiece is held against the bottom of the foot and bandages are wrapped around the leg and the foot. The sharp points of the pins 9 perforate the bandages as they are wrapped around the footpiece and after several layers of bandages are applied over the pins 9 the leg portions 16 and 17 are bent in opposite directions, as indicated in Fig. 5, so that the footpiece is rigidly held in place relative to the bandages. More layers of the bandages are then wrapped around the leg portions 16 and 17 of the pins, the heel 4 is applied, and more bandages are applied to complete the cast.

After the cast is completed, the bottom portion of the plaster body 1, below the foot, is shaped to conform to the sole 7, as is apparent from Fig. 2, so that the footpiece B is rigidly held in place between the foot and the bottom portion of the cast, the front portion of the footpiece being rigidly supported in a cantilever fashion so as to provide proper support for the front portion of the foot f. Since the footpiece conforms to the shape of the foot, it distributes the forces on the foot evenly throughout the length and width of the foot so as to avoid the concentration of pressure on limited areas of the foot as is the case with a person wearing ordinary shoes. It is, therefore, possible for a person with broken bones in his foot to support his entire weight on his injured foot without applying forces to his broken bones sufficient to prevent proper knitting of the bones. The cast of the present invention, therefore, permits a person to walk without the aid of crutches in a short period of time and to avoid loss of wages due to absence from work.

The footpiece of the present invention may also be fitted into an oversized shoe to protect the foot of a person having a broken toe or a broken metatarsal bone, in which case the pins 9 would be omitted. Heretofore such a person was required to stay off his feet for substantial periods of time and to stay home from work.

With the foot piece of the present invention, such a person can quickly return to work and needs only to buy an oversized shoe to receive the rigid footpiece. The conventional shoe sole is, of course, too flexible to protect the broken bones of a foot.

It will be understood that the above description is by way of illustration rather than limitation and that, in accordance with the provisions of the patent statutes, varia-

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tions and modifications of the specific devices disclosed herein may be made without departing from the spirit of the invention.

Having described my invention, I claim:

1. A plaster cast comprising a walking heel having a ground-engaging heel portion and forwardly and rearwardly extending flanges, said heel portion having a bottom surface which is curved forwardly and rearwardly to permit a rocking movement of the cast in the direction of its movement during normal use, a plaster body having leg-receiving and foot-receiving portions, a bandage wrapped around said plaster body and said flanges to reinforce said body and to hold said walking heel in position, said flanges being embedded in the lower foot-receiving portion of said cast, and a rigid foot-supporting member shaped like a shoe sole for engaging the portion of said plaster body in which said flanges are embedded, a portion of said member projecting beyond said plaster body, said last-named portion being shaped to conform to the shape of the bottom surface of said member.

2. A plaster cast as defined in claim 1 wherein said last-named member has a plurality of pins projecting downwardly from its bottom surface to hold said member in place in the cast and wherein a relatively thick foot-engaging layer of soft padding material is provided on top of said member.

3. In combination with a foot enclosing device having a ground engaging heel, a footpiece comprising a thin rigid metal sole of generally uniform thickness shaped like a shoe sole and having a heel portion, a wider ball-engaging and toe-engaging portion and an arched intermediate portion, a plurality of sharply pointed pins rigidly connected to said metal sole and projecting downwardly therefrom, and a foot-engaging layer of padding material having a substantially uniform thickness of at least four times that of said metal sole cemented to and completely covering the top surface of said metal sole.

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