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(54) SHOE

(71) We, MERCK & Co. INC., of Rahway, New Jersey, United States of America, a corporation organised and existing under the laws of the State of New Jersey, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

Various shoes have been proposed to be worn over or in conjunction with an orthopaedic cast. For example, U.S. Patent No. 2,614,340 describes a walking cast shoe having a front flexible sole which terminates abruptly beneath the instep of the foot, a toe cap upon the forward portion of the front sole, and a pair of upper portions upon the sole having a lace for drawing the upper portions together upon the forward portion of the foot. U.S. Patent No. 2,598,217 describes an invalid's boot which may be worn over an orthopaedic cast comprising a pair of upper side sections and a bottom section, all formed of light flexible textile material, the pair of side sections being sewn together at the heel edges and the bottom section sewn to the sole edges of the side sections. The side sections of the boot have free front edges extending from the top to the point of contact of the upper side sections with the toe end of the boot sole. A relatively thin flat wear-resisting outer sole member is secured to the outer face of the bottom textile section. There are several difficulties with these devices. The sole of a shoe effective for the protection of an orthopaedic cast and the contained body member should advantageously be rigid. The shoes discussed above have a flexible base or platform which simply does not absorb loading and shock. As a consequence, these devices are not generally acceptable for use on walking casts. If they are used for this purpose, damage to the cast, and perhaps to the body member within the cast, can occur. Further, even if these devices were rigidified along their bottom surface, they could be used

walking casts only with difficulty and inconvenience as will be more fully hereinafter explained.

It is an aim of the present invention to provide a shoe primarily intended to be worn over or in conjunction with an orthopaedic cast which better protects the cast and facilitates walking and the use of the immobilized member.

The present invention provides a shoe comprising a rigid platform which is thicker at the center than at the heel and toe to form a curved rocker-like lower surface, a resilient sole covering said lower surface, and a soft flexible upper, the inside surface of said platform carrying a layer of resilient flexible material.

An example of this invention will now be particularly described with reference to the accompanying drawing, in which:

Figure 1 is a perspective view of the front and side of a shoe in accordance with the present invention;

Figure 2 is another view of the shoe in perspective and with a portion broken away for the purpose of illustration; and

Figure 3 is a perspective view from the side and rear of the shoe.

Turning to the drawings in greater detail, in Figure 1 the rigid platform is indicated generally at 10, the platform is thicker at the center 12 than at the front end 14 of the rear end 16. The bottom surface of the platform 10 is covered with a thin layer of an abrasion-resistant resilient material 18. The flexible upper portions 20 are preferably joined at the rear by transverse member 22 and the upper portions may, if desired, be finished at the edges with piping 24. A variety of closure means may be provided. In the drawings, the closure means are provided by the shoelace 26 which runs in zigzag fashion through eyelets 28. Inside the shoe and covering the entire inner surface of the platform 10 is a flexible resilient layer 30.

Many variations of the present invention are possible. The platform 10 may be made

(B) virtually of any essentially rigid material such as wood, rigid plastic or even metal although metal normally would not be used because of cost. The sole 18 is normally rubber but may be any of the conventional shoe sole compositions such as neoprene, crepe and the like. The upper portions 20 may be made of any flexible upper material such as canvas, cloth, leather, or any of the various porous synthetic upper materials. The inner layer 30 is preferably made of sponge rubber or flexible polyurethane foam.

In use, the shoe is simply placed over the foot after the foot has been encased in a rigid plaster or plastic cast. The preferred type of cast is that described in United States Patent No. 3,421,501. In any event, after the ankle, instep and arch have been immobilized by a suitable rigid cast, the cast is placed in the shoe and the flexible upper portions 20 are secured in place over the instep by shoelaces or by any other connecting device such as a zipper or the use of "Velcro" (Registered Trade Mark). The patient may then easily walk with a rocking-like action provided by the platform 10 which, due to its being thicker in the center, facilitates a to and fro type action which makes it easier for the person wearing the cast to move about. Another important function of the rigid platform 10 is that it absorbs the stress associated with the loading involved in walking. The cast itself is thereby isolated from such stresses. The cracking and disintegration of casts when they are subjected to the loads associated with walking has long been a problem in this art. These problems are substantially solved by the embodiment of the invention described.

Many other variations in the invention are

contemplated. For example, the shoe may have a closed toe upper and a tongue. The upper may also be made of a stretch material to facilitate the taking on and off of the shoe and to eliminate the need for shoe laces or the equivalent.

WHAT WE CLAIM IS:—

1. A shoe comprising a rigid platform which is thicker at the center than at the heel and toe to form a curved rocker-like lower surface, a resilient sole covering said lower surface, and a soft flexible upper, the inside surface of said platform carrying a layer of resilient flexible material. 50
2. A shoe according to claim 1, in which the upper is open-toed and comprises two side flap portions connected to the sides of said platform and adapted to be connected to each other over the arch of the foot. 55
3. A shoe according to claim 1 or 2, in which the platform comprises a plastics material. 60
4. A shoe according to any preceding claim in which the sole is rubber.
5. A shoe according to any preceding claim in which the upper is canvas. 65
6. A shoe according to claim 2, in which each flap portion includes eyelets for shoelaces.
7. A shoe substantially as hereinbefore described with reference to the accompanying drawings. 70

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