

[54] CAST SHEATH WITH SEALING CLOSURE

[76] Inventors: Benjamin Goldman, 12238 Cantura St., Studio City, Calif. 91604; Irwin J. Russakov, 6600 Whitaker Ave., Van Nuys, Calif. 91406

[22] Filed: May 30, 1972

[21] Appl. No.: 257,758

[52] U.S. Cl. 2/240, 36/8.1, 128/82, 2/61

[51] Int. Cl. A41b 11/10

[58] Field of Search 2/240, 239, DIG. 6, 2/61, 162, 167, 161 A; 36/7.1 R, 7.3, 8.1, DIG. 2; 128/82, 157

[56] References Cited

UNITED STATES PATENTS

1,138,521	5/1915	West	2/240
1,980,486	11/1934	King et al.	36/8.1
3,000,384	9/1961	Piers, Jr.	2/DIG. 6
3,324,580	6/1967	Baxter	128/82 X

FOREIGN PATENTS OR APPLICATIONS

17,180	12/1892	Great Britain	2/240
--------	---------	---------------------	-------

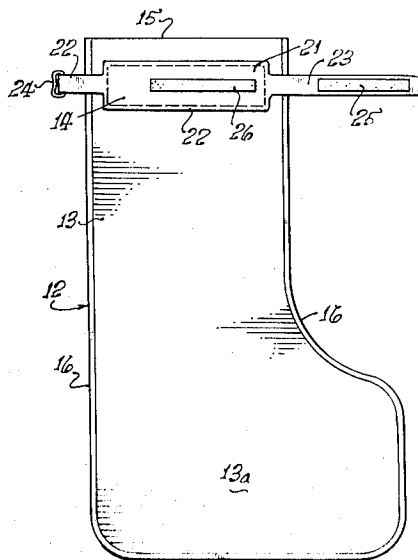
Primary Examiner—James R. Boler
Attorney—Edmond F. Shanahan

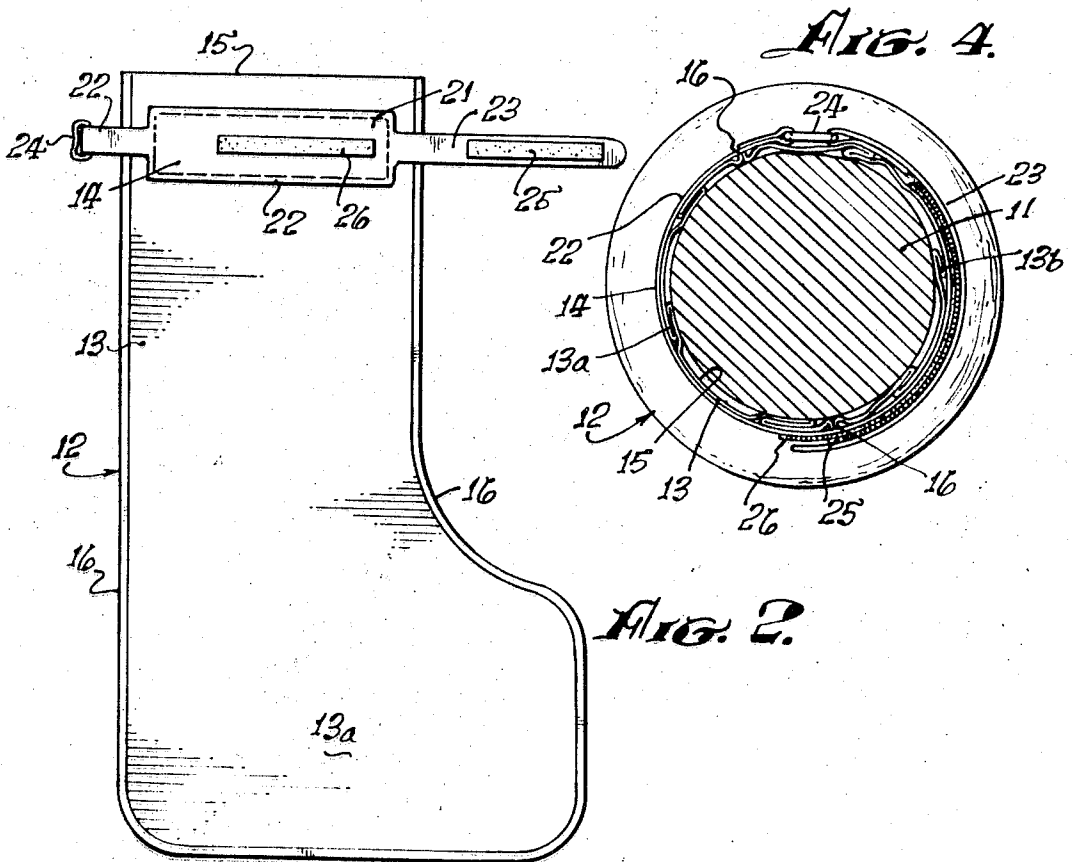
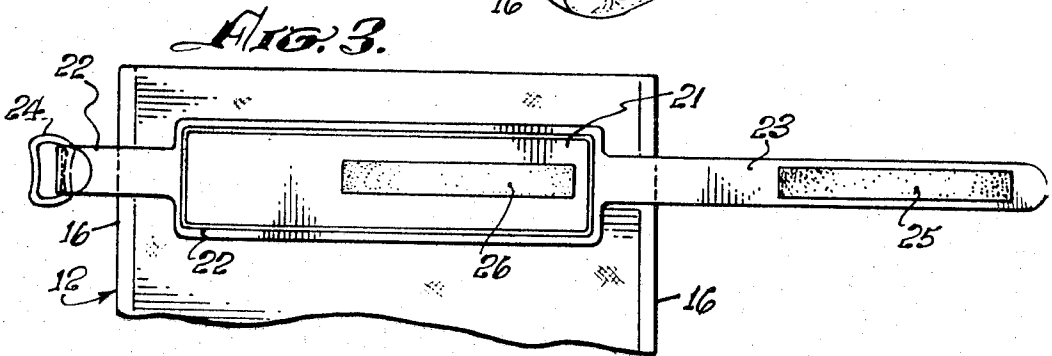
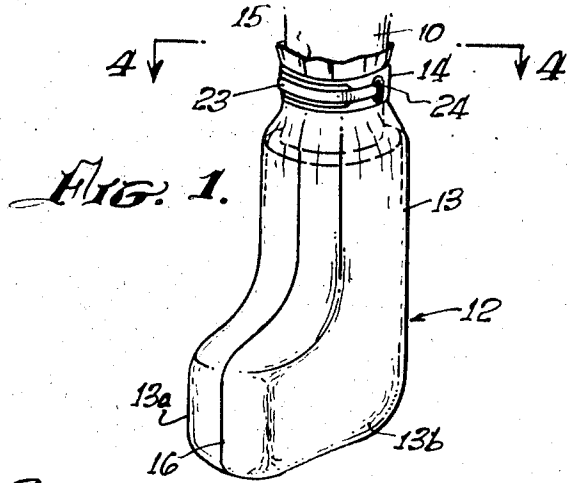
[57] ABSTRACT

A waterproof sheath, comprised of a sock member and a closure member, for covering and protecting a plaster cast enclosing a broken limb.

The sock member is made of a flexible waterproof sheet material, such as vinyl plastic sheet, with an outer surface which is embossed, or otherwise formed, with a coarse grain. The closure member is comprised of an elongated panel of flexible material partially encircling the opening of the sock member, and welded to the sock member around the periphery of the panel. Strap members extend from each end of the panel, the first strap member having a buckle and a second strap member being designed to encircle the leg of the user and pass through the buckle. The second strap member and the panel are provided with mating strips of fabric having mutually engaging and locking surfaces, to permit the adjustable closure of the sock member by means of the closure member.

2 Claims, 4 Drawing Figures





CAST SHEATH WITH SEALING CLOSURE

This invention relates to an improved protective sheath for a plaster cast used in the surgical correction of a broken limb.

The sheath of the invention is particularly useful to a person whose lower leg must remain encased in a plaster cast for several weeks during the healing of a bone fracture; the invention will, therefore, be described in terms of a sheath for the foot and lower leg, although it will be appreciated that special sheaths could be fabricated within the scope of the invention for the upper leg, or an arm cast.

A person wearing a cast on his foot or lower leg is usually not immobilized; he can walk with the aid of crutches or a cane, and can move from chair to bed, and the like without assistance from others. He encounters serious difficulty in daily bathing, however, unless he can protect his plaster cast from water damage.

The entire lower leg and foot can be protected to some degree by means of a loose-fitting sock of waterproof sheet. In addition to the sock, some type of garter or strap must be employed around the sheath and leg above the cast, and usually above the knee, in order to keep water from running into the sock and damaging the plaster cast.

In general, waterproof socks which have been tried have been extremely slippery. A user attempting to walk on a wet tile floor in a bathroom or shower stall has been exposed to a substantial risk of falling.

An even greater difficulty has been encountered with attempts to provide suitable sealing closure of the waterproof sock. Various garters, straps, and ties, which have been the subject of experiment, have tended to operate as a tourniquet, shutting off blood supply to the limb encased in the plaster cast. The present invention overcomes these and other objections to the use of a protective sheath during bathing by providing a sheath which is slip resistant and which can be sealed to the leg of the wearer, with substantially watertight closure, without any significant interference with blood circulation of the wearer.

The sheath of the present invention employs a sock member which is made of a flexible plastic sheeting with a coarsely grained exterior surface. The coarsely grained exterior surface not only makes the surface of the foot bearing on the floor resistant to slip, but is also provides a surface near the upper opening of the sock member upon which a plastic closure member may be securely welded.

It will be seen from a description of a preferred specific embodiment hereinafter, that the closure member achieves most of its sealing to the leg of the wearer, by means of a panel which distributes a large sealing area over the skin of the leg of the wearer, thus achieving sealing without undue pressure.

The novel features and the utility of the invention will best be understood from the following description of a preferred embodiment, which description should be read with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a sheath constructed according to the invention as it appears in use, enclosing the foot and lower leg of a wearer;

FIG. 2 is a flat view of the empty sheath;

FIG. 3 is a much enlarged flat view of the upper portion of the sheath, showing the closure member in detail; and

FIG. 4 shows a cross-sectional view of the sheath of FIG. 1, looking down from a horizontal plane just above the closure member, as indicated by the arrows 4-4 in FIG. 1

In FIGS. 1 and 3, the leg of the wearer is indicated symbolically, in side view of 10 in FIG. 1, and cross-section above the knee at 11 in FIG. 3.

In FIG. 1, the sheath, indicated generally by the numeral 12, is seen in position on the leg 10.

The sheath 12 is comprised of two functioning parts, a sock member 13 and a closure member 14, the latter being used to tightly close the sock member opening 15 around the leg 10.

In FIGS. 2 and 3, it is seen that the sock member 13 is comprised of two pieces of flat plastic sheeting, 13a and 13b, which are welded together by a heat-seal seam 16, except at leg opening 15.

It is an important feature of the invention, that the plastic sheeting, preferably a good quality of water-impervious polyvinylchloride, or other suitable thermoplastic material, is formed with a coarsely grained exterior surface to present a slip resistant surface on the fore surface when the user is wearing the sheath 12. Previously fabricated bags used to cover wound dressings have had smooth surfaces and would be dangerous to the already-crippled wearer of a foot cast.

The closure member 14 is illustrated in this preferred specific embodiment as of the type known in commerce as a Velcro fastener, although other equivalent engagement-fabric fasteners may be used.

In previously known designs of this type, the fastener has been prone to failure under repeated use, where mounted on plastic sheeting of the type required for the sock member 13. In the present invention, such failures are not likely to occur, even after repeated use, because the fastener member 14 includes a mounting panel 21, which is a piece of plastic sheeting heat welded around an extended periphery 22 to the plastic sheeting of the sock member 13.

Integral with the panel 21, are first and second strap members 22 and 23 respectively. First strap member 22 carries a buckle 24. Second strap member 23 carries a strip of engagement-fabric 25. A mating second strip of engagement fabric 26 is mounted in the central portion of the mounting panel 21.

A major source of failure in this construction is avoided by spacing the peripheral welded mounting seam 22 away from the area on which the second engagement fabric strip 26 is attached to the mounting panel 21. Preferably, this spacing should be not substantially less than the width of the engagement-fabric strip 26. This provides a portion of welding panel 21 in the peripheral area entirely around the second strip 26, which is at full strength, and unaffected by possible irregularities in strength along the line of the seam 22, at which the welding panel 21 is attached to the sock member 3.

The cross-sectional view of FIG. 4 reveals the adjustable positioning and locking of the closure member 14. Second strap 23 is pulled through buckle 24 and pulled back at the fold 31. Second strap 23 is pulled tight about leg 11, and locked by bringing the strip 25 into locking engagement with strip 26. It will be seen that the tightness of closure of closure member 14 may be

adjusted to the comfort of the wearer so as not to shut off blood circulation in the leg.

It will also be seen that the panel 21 plays an important role in the comfort of the wearer of sheath 12.

The closure pressure on leg 11 is distributed vertically by the width of the panel 21 (longitudinally of leg 10). As seen in FIG. 4, most of the sealing closure of closure member 14 around leg 11 is distributed over the relatively wide panel 21. The width of panel 21 longitudinally with respect to the limb may be proportioned to the size of sheath 12, to provide water-resistant sealing without substantial impediment to blood circulation in the leg or arm, in the case of an arm cast.

It will be understood, that the tubular upper portion 35 of sock member 13 entirely encloses the surgical cast on the limb of the user, and that the sealing illustrated in FIG. 4 brings the upper part of the sock member 13 into direct contact with the flesh of the leg 11. The cast on the lower part of the limb of the user is thus entirely protected from moisture during the taking of a shower.

We claim:

1. A sheath for covering a surgical cast on the limb of a user, which sheath comprises:

- a sock member loosely receiving said cast, said sock member being made of a flexible, waterproof, thermoplastic material, the exterior surface of said sock member being coarsley grained to present a

slip-resistant surface, said sock member having a tubular opening encircling the leg of said user above said cast; and

a closure member adapted to encircle the leg of a user above said cast, which member comprises:

- a panel of flexible thermoplastic material welded at its periphery to the exterior surface of said sock member adjacent said tubular opening, said panel being elongated transversely of said limb and having sufficient width longitudinally of said limb to provide water-resistant sealing without substantial impediment to blood circulation in said leg;

first and second strap members extending from the respective ends of said panel; a buckle on said first strap member; mating engagement-fabric strips on said panel and said second strap member, whereby said second strap may be passed through said buckle, pulled into water-tight sealing contact with said limb, folded back to said panel, and retained in tight closure of said sheath by placing said mating engagement-fabric strips in attaching contact.

2. A sheath as described in claim 1 in which said engagement-fabric strip on said panel is spaced around its periphery from the peripheral weld of said panel to said sock member by spacing not substantially less than the width of said strip, and said strip is welded to said panel over substantially its entire adjacent surface.

* * * * *

30

35

40

45

50

55

60

65