

[54] FOOT SUPPORT

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[51] Int. Cl. A61f 5/04
[58] Field of Search 128/83.5, 83, 149, 153,
128/595, 90, 582

[56] References Cited
UNITED STATES PATENTS

2,509,821	5/1950	Holstrom	128/83.5 X
2,875,752	3/1959	Lovich	128/83.5 X
3,068,861	12/1962	Hoopes	128/83.5
3,198,192	8/1965	O'Brien	128/83.5
3,216,417	11/1965	Posey	128/149
3,406,683	10/1968	Steinberg	128/153 X
3,545,447	12/1970	Silverman	128/595 X
3,661,151	5/1972	Schoenbrun et al	128/83.5
3,721,237	3/1973	Alessio	128/153 X

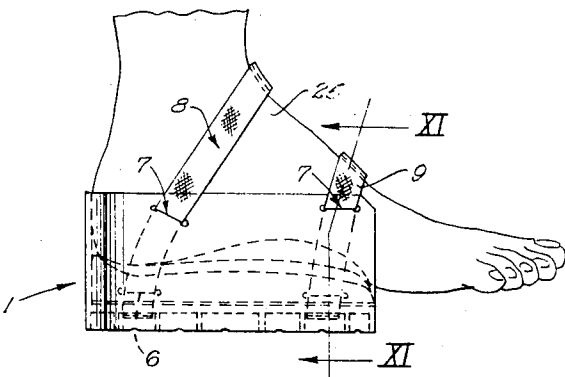
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[57] ABSTRACT

A shoe construction primarily intended as a prosthetic device to be worn by a patient who has sustained an injury or operation on the ball of the foot or the forward portion of the foot to elevate same from the floor while walking and to cushion and support the foot while walking, or while the patient is in prone position. The shoe evenly distributes the weight of the wearer on the arch and heel of the foot, enabling the wearer to walk comfortably after surgery without applying pressure to the ball of the foot. It consists of an open ended boot in which a liner conformed to the shape of the foot is detachably inserted and held in place about the foot. The boot may be made to accommodate different sizes of feet into which liners may be inserted and detachably secured so that same may be reused by patients having different sizes and shapes of feet.

The liner is made by a unique method to form a unitary liner of foam plastic encased with a thin layer of polyvinyl chloride (PVC) or like material with the lower surface on the liner covered with impervious nylon fabric held in place by friction discs provided thereon.

5 Claims, 11 Drawing Figures



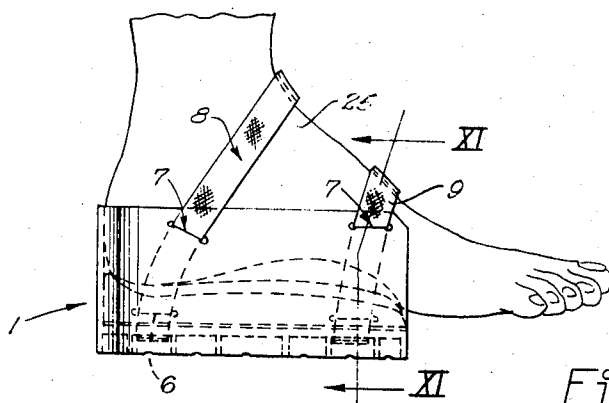


Fig. I

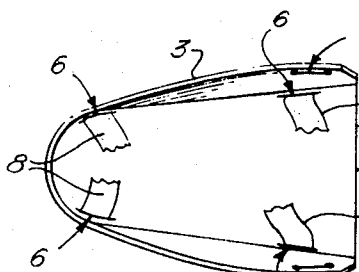


Fig. II

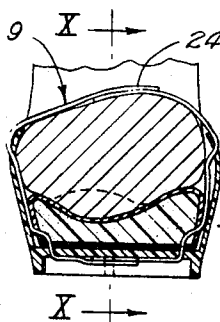


Fig. XI

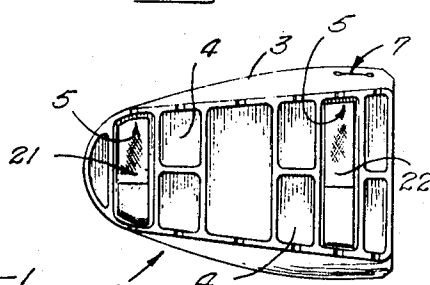


Fig. III

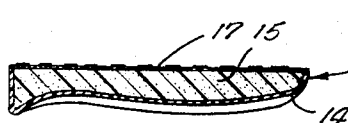


Fig. VIII

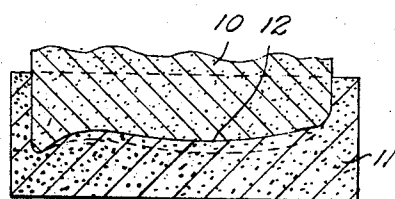


Fig. IV

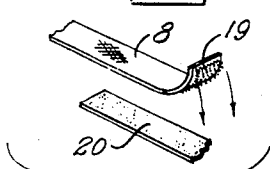


Fig. IX

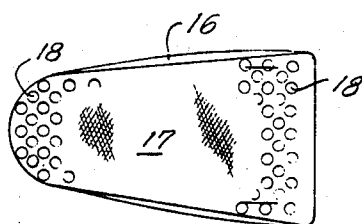


Fig. VII

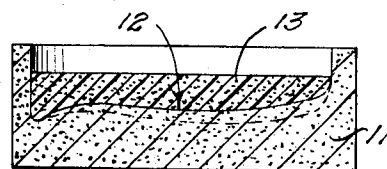


Fig. V

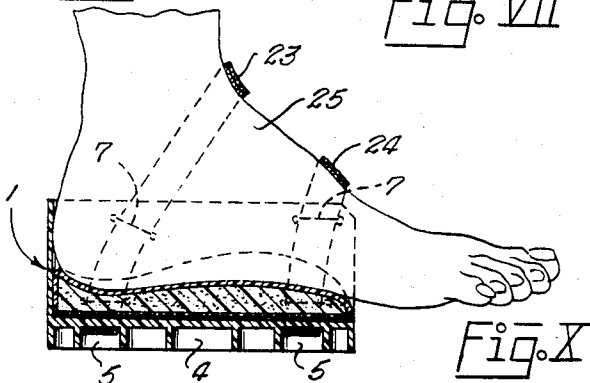


Fig. X

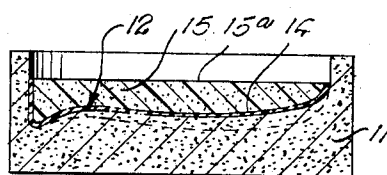


Fig. VI

FOOT SUPPORT

BACKGROUND OF THE INVENTION

Various types of slippers and slides have been provided for patients having injuries to their toes, ball of foot or forward portion of the foot but none have been entirely satisfactory, because they usually are provided with strap or toe portion extending about the forward part of the foot to hold them on, and they do not provide for a resilient support of the foot which also elevates the forward portion of the foot from the floor. Moreover, such devices had to be made in different sizes so that the hospital or clinic was required to stock various sizes of such supports.

It is a primary object of the present invention to provide a shoe type foot support having an open-end base member of universal size arranged to detachably receive a foot support to conform to the size of the particular patient on which foot support is disposable.

Another object of the invention is to provide the prosthetic foot support which is attachable about the heel and rear portion of the foot, elevating the toes and the forward portion of the foot from the floor, which is quickly and easily attached.

A still further object of the invention is to provide a foot support which supports the foot, yet is resilient and comfortable to the wearer, and eliminates the necessity of casts in many instances.

Still another object of the invention is the provision of a foot support consisting of a walking boot having a resilient removable support therein conformed to the size and contour of the foot of the particular wearer wherein the boot has means formed on the bottom surface thereof to prevent slipping by the patient.

Still another object of the invention is to provide a method of forming a resilient support to be placed in a standard open ended boot or casing wherein such support may be molded into an integral unit of a central portion of foam plastic lined on the outer side with a thin layer of smooth plastic material such as polyvinyl chloride (PVC) and which is covered on the flat side thereof with the impervious plastic sheet material having friction discs thereon to retain same in the casing.

Other and further objects of the invention will become apparent upon reading the detailed specification hereinafter following and by referring to the drawing annexed hereto.

DESCRIPTION OF THE DRAWING

A suitable embodiment of the invention is shown in the attached drawing wherein,

FIG. I is a side elevational view showing the prosthetic device attached to the foot of the wearer;

FIG. II is a top plan view of the universal boot or shell;

FIG. III is a bottom plan view of the boot or shell;

FIG. IV is a cross-sectional elevational view of the female mold cavity with the cast of a foot is placed therein, used in forming a female mold cavity of the impression of the patient's foot;

FIG. V is a cross-sectional elevational view of the mold cavity with plastic material which has been placed therein prior to pouring off excess to provide a covering for the foam plastic material to be placed therein in forming the resilient boot liner;

FIG. VI is a cross-sectional elevational view of the female mold cavity after the plastic liner has been formed and the foam rubber or plastic material has been deposited therein to provide the resilient base for the finished boot liner;

FIG. VII is a bottom plan view of the liner after it has been completed, showing the impervious fabric covering the outer side thereof having suction cups thereon to prevent slippage between same and the inner surface of the boot;

FIG. VIII is a transverse sectional view of the completed liner;

FIG. IX is a perspective view of the Velco tape employed in detachably securing the liner to the boot;

FIG. X is a sectional view taken along the line X—X of FIG. XI; and

FIG. XI is a sectional view taken along the line XI—XI of FIG. I.

DESCRIPTION OF A PREFERRED EMBODIMENT

Numeral references are employed to indicate parts and elements shown in the attached drawing, and like numerals indicate like parts throughout the various figures of the drawing.

The numeral 1 indicates the universal boot or casing which is molded and formed of suitable plastic material such as polyvinyl chloride (PVC) which includes a flat inner wall 2 with an upstanding flange 3 extending thereabout, and an open, straight end.

Cavities 4 are formed on the lower surface of the boot which not only lightens the weight of the boot, but provide suction cups to prevent slippage of the boot on the floor.

Elongated strap receiving cavities 5 extend transversely along the lower surface of the boot at each end thereof.

Slits 6 are formed through the wall 2 at each end thereof, communicating with the cavities 5. Slits 6 and 7 are formed through the flanges 3 through which the flexible straps 8 and 9, which may be made of plastic, rubber or other suitable material, may be extended for detachably attaching the liner 16 in the boot 1 in the manner hereinafter described.

The detachable liner 16 is formed in the following manner:

Referring to FIGS. IV—VI, inclusive, a cast 10 is made of plaster of paris or other suitable material to conform to the contour of the foot for which the liner is to be made. This may be done in the usual manner by making an imprint with the bottom of the foot against which the casting is formed.

Utilizing the casting 10 a mold 11 is formed having a female cavity 12 therein of the shape of the bottom of the foot for which the liner is being made.

A quantity of suitable plastic material 13, such as PVC, in liquid state, is deposited in the mold cavity, such quantity being more than enough to form the outside casing for the liner 16. The mold 11 is agitated to stir the liquid plastic material 13 as it sets into a relatively thin membrane 14 on the inner surface of the mold cavity 12, whereupon the excess material 13 is poured off, leaving a lining 14 of plastic material in cavity 12. After the liner 14 is formed in the mold cavity 12 the quantity of resilient foam rubber or plastic material is deposited therein in unset condition, whereupon accelerator is added thereto to cause same to set. After

the foam rubber or plastic has set and become integral with the plastic liner 14 the composite liner is removed from the mold and the exposed side of foam rubber material is trimmed away and flattened as indicated at 15a, whereupon it is covered with a layer of impervious nylon fabric material 17 which has friction discs 18 formed on the outer surface thereof. The friction discs 18 protrude outwardly from the surface of the material 17 and are formed of roughened plastic material which adhere integrally to the material 17 so that when the flat side of the liner 16 is placed against the flat inner side of wall 2 of the shoe 1, the friction discs 18 will adhere thereto and retain the liner 16 in the shoe.

After formation, the completed foot support liner 16 is placed in the boot 1 with the flat surface thereof contacting the flat inner surface of wall 2 of the boot whereupon it is attached about the foot by flexible straps 8 and 9. Straps 8 and 9 may be made of any suitable material, such as plastic or rubber and may have any suitable attachment means at the end thereof, such as snaps or a Velco fastener or buckles. Preferably, the ends thereof are detachably secured together by means of frictionally engaged means such as that which is known in the trade as "Velco" tape which includes a plurality of wire-like members 19 having hooks on the outer ends thereof which are engaged with wire engaging fibrous material 20 on the inner surface of the other end thereof, so that there will be no outwardly extending buckles or other engaging members when the ends of the straps are joined together in the recesses 5 as indicated at 21 and 22 in FIG. III.

After the liner 16 has been placed in the boot 1 in the manner hereinbefore described the straps 8 and 9 are extended inwardly through the slits 7 in the flange 3 and through the slits 6 through the bottom wall 2 of the shoe 1. The free ends of the straps 8 and 9 are then overlapped and interengaged within the recesses 5 and the outer ends thereof are overlapped and joined about the foot 25 of the wearer as indicated at 23 and 24, to thereby flexibly secure the assembled foot support member to the foot in supporting position.

It is contemplated that each liner assembly 16 will be formed in the manner hereinbefore indicated to fit the particular contour of the bottom of the foot of a particular wearer; and that the boots may be made of universal size to receive the different contours of liner 16.

Thus it will be seen that when the boot and liner assembly is engaged about the foot of the wearer the wearer may easily walk thereon with the instep and heel in supported position, but injured toes on the outer

end of the foot are free and raised out of engagement with the floor. Thus relatively minor fractures, bruises or other injuries to the outer extremities of the foot may be supported and protected by light bandages and it will not be necessary to put a cast thereon as would be advisable without the use of the foot support hereinbefore described.

Although the foot support assembly is primarily intended as a prosthetic device it will be readily appreciated that it can be used generally as a leisure shoe which permits the major portion of the foot to be exposed yet at the same time provides a firm and comfortable support therefor; and could be used as a beach or swimming shoe, the recesses 4 formed on the bottom surface thereof providing suction cups to prevent slipping on wet surfaces. When sold commercially as a leisure shoe the liner 16 would be made in standard sizes formed to the contour of normal feet.

It will be understood that other and further embodiments of the invention may be devised without departing from the spirit and scope of the appended claims.

Having described my invention, I claim:

1. In a foot support, a receptacle having a bottom wall, an open end, and an upstanding flange extending thereabout; a flexible liner of resilient foam material encased in plastic material disposed in the receptacle, said liner having a flat side and a rounded side; impervious plastic adhered to the flat side; friction discs on the outer surface of the impervious plastic material, said discs being arranged to be pressed against the surface of the wall to retain the liner therein; and means to detachably attach the receptacle and the liner together and extendable about the foot of a wearer to attach same to the foot.

2. The combination called for in claim 1 wherein the attachment means are elastic bands extending through slots in the flange and in the wall, and disengageable attachment means between ends of the elastic bands to secure same together.

3. The combination called for in claim 1 with the addition of a plurality of recesses formed on the lower surface of the wall.

4. The combination called for in claim 2 wherein the ends of the straps extend into one of the recesses and are attached together therein.

5. The combination called for in claim 3 wherein the ends of the straps are attached together by means of interengaging friction means.

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