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A. J. WRIGHT

3,099,103

BALL JOINT FEET FOR LADDERS AND THE LIKE

Filed Oct. 31, 1961

Fig. 1.

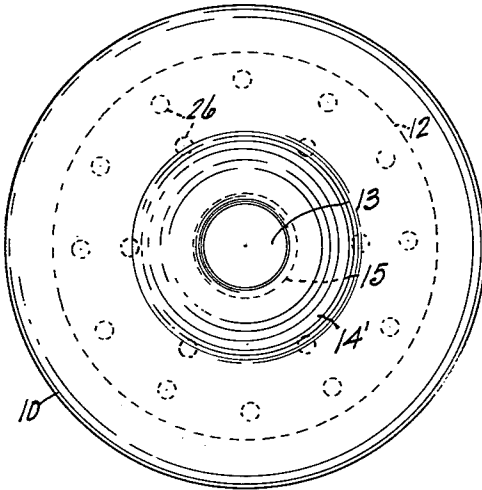


Fig. 4.

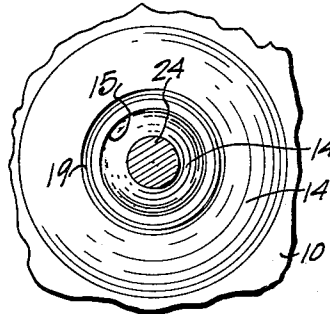


Fig. 2.

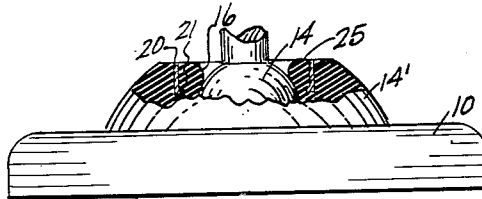
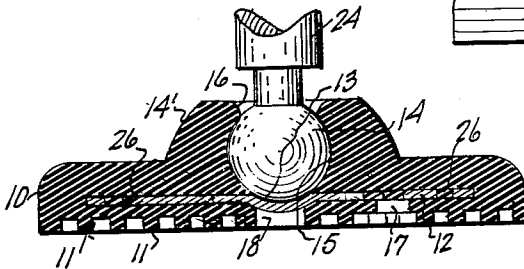


Fig. 5.

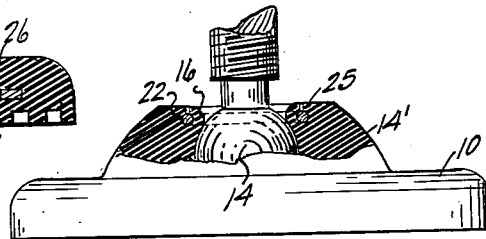


Fig. 6.

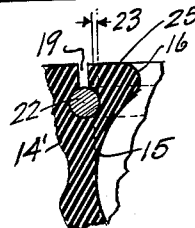
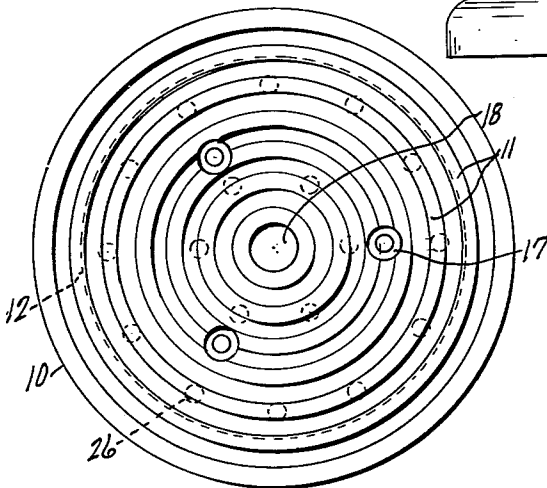


Fig. 7.

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Fig. 3.



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BALL JOINT FEET FOR LADDERS AND THE LIKE

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This invention relates to improvements in supporting members for ladders, machinery, and other types of devices where non-slip, supporting surface conforming cushioned feet are desirable or essential, and provides a foot formed of a resilient material and a non-slip bottom surface and connected by a ball and socket joint to the device or appliance, and is specifically designed for use in connection with the Slope Support Compensators for Ladders disclosed and claimed in my application, Serial Number 121,968 filed July 5, 1961, and which provides the utmost in safety in the use of ladders.

The objects and advantages of the invention are as follows:

First, to provide a supporting foot which will conform to level or inclined supporting surfaces.

Second, to provide a foot as outlined with a non-slip sole.

Third, to provide a foot as outlined formed of a resilient material and having a socket for a ball connection, with a rigid seat provided for the ball, and with the top of the socket stretchable for insertion of the ball.

Fourth, to provide a foot as outlined with locking means for the ball and consisting of an insertable ring of non-stretchable material for insertion in the top of the foot following seating of the ball in the socket.

Fifth, to provide a foot as outlined which is of the simplest possible construction and moldable as a unit.

In describing the invention reference will be had to the accompanying drawings, in which:

FIG. 1 is a top plan view of the invention.

FIG. 2 is a sectional elevation through the invention with the ball connection in position.

FIG. 3 is a bottom plan view of the invention.

FIG. 4 is a fragmentary top plan view of a modification provided with a locking ring insert.

FIG. 5 is a side elevation of the modification shown partly in section.

FIG. 6 is a view similar to FIG. 5 but showing a modification of the locking ring.

FIG. 7 is a fragmentary sectional elevation showing the modification of FIG. 6 on an enlarged scale.

The invention, in its simplest form, consists of a base portion 10 which may be of any desired form but shown as circular and being most effective, with the sole or bottom of the base provided with anti-slip elements such as the series of concentric ribs 11.

A rigid member 12 is preformed with a concavity 13 on which the ball 14 seats. The hub 14' projects above the base as shown and has the spherical ball socket 15 formed therein with the opening in the top having a diameter equal to approximately three-quarters of that of the ball for forced passage of the ball therethrough for resiliently securing the ball in the socket, the upper end being relieved as indicated at 16 to permit easier forced insertion of the ball. The sole is cored by supports for the rigid plate 12 as indicated at 17 during the molding process, and the sole is relieved under the ball seat as indicated at 18 to insure proper functioning of the non-slip beads or rings 11, since a mass of material under the concavity would absorb too much of the load and reduce the effectiveness of the non-slip elements.

It is merely necessary to wet the socket with water to permit forced insertion of the ball through the opening into the socket. The foot will not come off the ball

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except through forced retraction, however, the ball can be positively locked in the socket against removal even through forced retraction through the medium of a non-stretchable ring having an inside diameter practically equal to or less than the diameter of the ball, and may consist of a flat ring or a wire ring inserted in a suitable circular slit molded in the top of the socket portion.

Obviously the circular slit can be cut in by a circular knife blade punch, but is more readily and economically formed during the molding process, the slit 19 being relatively narrow. If a flat ring 20 is to be used, it will be necessary to form a slight bead or flange 21 at the lower end for retention in the slit, however a wire ring as shown at 22 when inserted, will be definitely locked in position and is the most economical to use.

As indicated in FIG. 7, the inside diameter of the ring should be slightly less than the diameter of the ball as indicated at 23, therefore it will be necessary to pass the ring over the shank 24 of the ball connection.

The neck 25 is sufficiently elastic to permit the ball to be forced into the socket, and, therefore, will also permit its removal if locking rings are not inserted.

If a locking ring is applied and forced down to the bottom of the locking slot, the ball cannot be removed without first prying the ring out of the locking slot.

Anchor passages 26 may be provided through the ball seat plate to interlock the body material on respective surfaces of the plate.

I claim:

1. A supporting surface comformable foot formed of resilient material and including a base having an upwardly projecting hub, and a ball having a shank, means for securing the ball in the foot comprising a ball socket formed downwardly in said hub and terminating at the upper end in an opening having a lesser diameter than that of the ball, requiring forced insertion of the ball into the socket and thereby being removable only through forced retraction,

a seat and reinforcement comprising a sheet of metal having a concavity formed centrally thereof to form the lower end of the socket, said sheet having a diameter in excess of that of the hub and slightly less than that of the base, and being molded in the base for decreased resiliency.

2. A supporting surface comformable foot formed of resilient material and including a base having an upwardly projecting hub, and a ball having a shank, means for securing the ball in the foot comprising a ball socket formed downwardly in said hub and terminating at the upper end in an opening having a lesser diameter than that of the ball, requiring forced insertion of the ball into the socket and thereby being removable only through forced retraction, a concentric slit formed downwardly in the hub to a diameter slightly less than that of the ball, and a non-stretchable ring removably inserted in said slit following forced insertion of the ball, for positively locking the ball in the socket.

3. A supporting surface comformable foot formed of resilient material and including a base having an upwardly projecting hub, and a ball having a shank, means for securing the ball in the foot comprising a ball socket formed downwardly in said hub and terminating at its upper end in an opening having a lesser diameter than that of the ball, requiring forced insertion of the ball into the socket and thereby being removable only through forced retraction, a sheet of metal having a diameter equal to approximately 80% of that of the base and having a concentric series of passages formed therethrough and being molded within the base with the resilient mate-

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rial interlocking through the passages, for decreasing the resiliency of the base, said sheet having a central concavity forming the lower portion of the socket and thrust seat for the ball.

4. In a supporting surface comformable foot formed of resilient material and having an upwardly projecting hub, a ball,

means for locking the ball in the foot comprising a ball socket formed downwardly in said hub through an included angle of approximately 270 degrees, and thereby terminating in an opening having a diameter equal to substantially three-quarters of that of the ball,

with the ball forcibly receptive into the socket through the opening for retention of the foot on the ball through the inherent resiliency of the upper walls of the socket.

5. A structure as defined in claim 4,

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a concentric slit having a diameter slightly less than that of the ball and

formed downwardly on the top of said hub, and a non-stretchable ring removably insertable in said slit following forced insertion of the ball in the socket for positively locking the ball in the socket.

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