United States Patent

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[54] **SOCKET STRUCTURE FOR LAMP STRING**
3 Claims, 4 Drawing Figs.

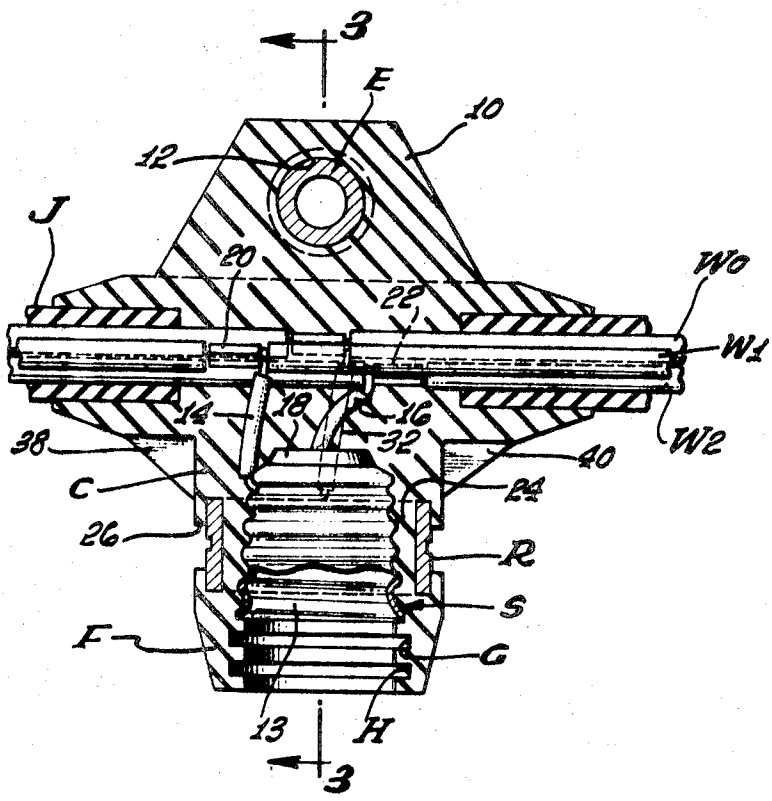
[52] **U.S. Cl.** **339/14,** 339/60, 339/94, 240/54
[51] **Int. Cl.** **H01r 3/06,** H01r 33/34
[50] **Field of Search** ..... 339/14, 59, 62, 60 R, 94 L; 240/54, 102

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ABSTRACT: The lamp string L (FIG. 4) has a series of identical socket assemblies A (FIGS. 1 and 2) each including a rubber case C cast about a standard screw socket S. A bulb cage B (FIG. 4) is carried on a ground ring R. The ground ring R is closely located about the socket S and positioned to shield the socket S from destructive forces. Grooves G and H trap moisture.



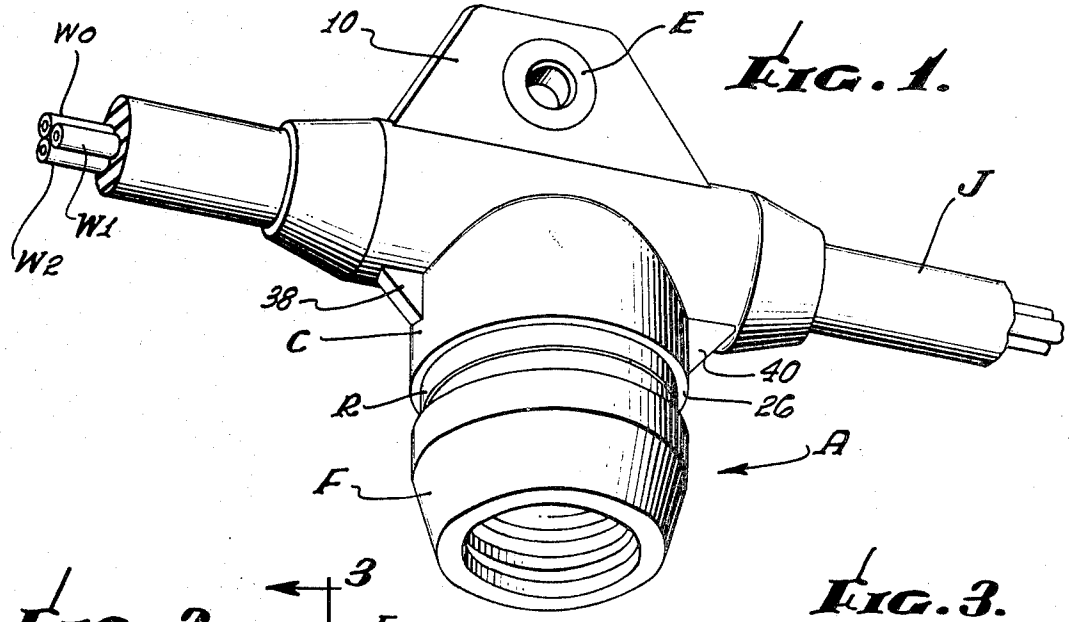


FIG. 1.

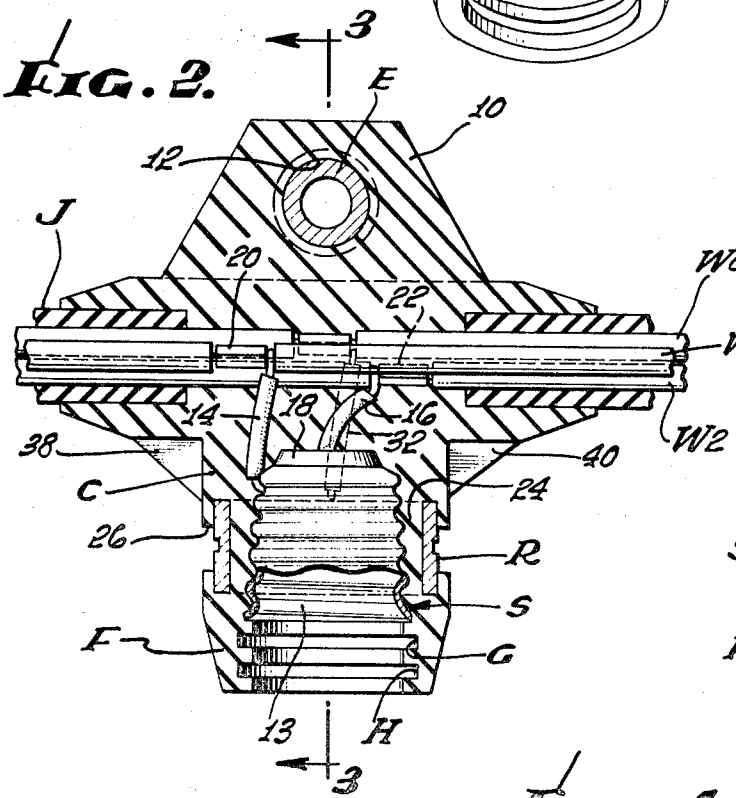


FIG. 2.

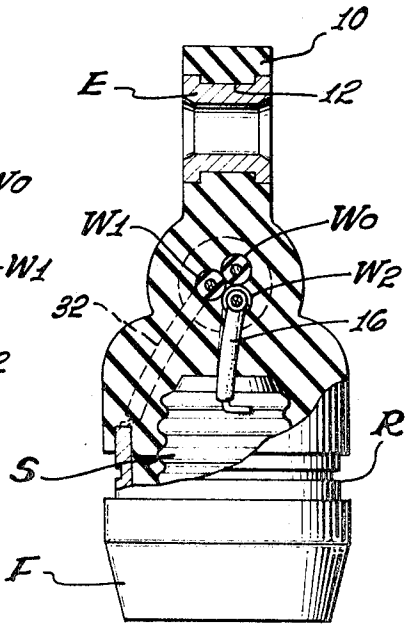


FIG. 3.

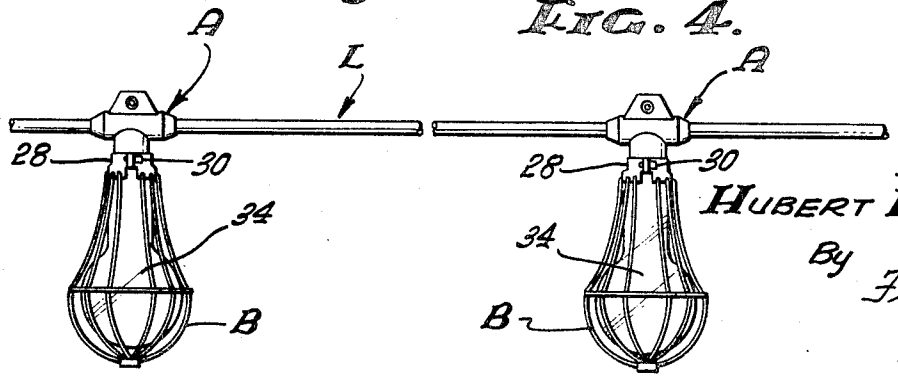


FIG. 4.

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SOCKET STRUCTURE FOR LAMP STRING

BRIEF SUMMARY OF THE INVENTION

Lamp strings used for temporary construction or the like are subject to considerable abuse. When coiled or strewn on the ground or on the floor, heavy equipment, or even the heel of a workman, can impose a force on the socket that will bend the socket hopelessly out of shape even though the socket is heavily jacketed in rubber. The useful life span of prior art lamp strings has thus been extremely short. Accordingly, the primary object of this invention is to provide a new socket assembly structure that adequately protects the fragile socket structure merely by rearranging the conventional elements of a lamp string. Thus, there is ordinarily provided a ground ring upon which a bulb cage is mounted. The ground ring is connected to a ground wire of a three wire set. This ground ring is designed to protect against a shock hazard should the bulb be broken and its filament touch the bulb cage. To protect the lamp socket from forces that would crush it, the ground ring is positioned and proportioned closely to circumscribe the lamp socket.

Another object of this invention is to provide a simple molded lamp socket having provisions for protecting the socket against entry of moisture. For this purpose, a plurality of spaced grooves are provided that form with the neck of the lamp bulb, a trap for moisture that might otherwise reach the socket.

Another object of this invention is to provide a lamp string having improved lamp sockets whereby operation of the lamp string as a whole is effectively extended free of repair.

This invention possesses many other advantages and has other objects which may be made more clearly apparent from a consideration of one embodiment of the invention. For this purpose, there is shown a form in the drawings accompanying and forming a part of the present specification, and which drawings are true scale. This form will now be described in detail illustrating the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of this invention is best defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a pictorial view of a lamp socket forming a part of a lamp string.

FIG. 2 is a transverse sectional view of one of the sockets of the string.

FIG. 3 is an axial sectional view taken along a plane corresponding to line 3–3 of FIG. 2.

FIG. 4 is a reduced scale pictorial view showing part of the lamp string with bulb cages affixed to the socket assemblies.

DETAILED DESCRIPTION

The lamp string L shown in FIG. 4 includes a series of identical socket assemblies A. One of the socket assemblies is shown in detail in FIGS. 1 to 3. The socket assembly includes a case C cast about three through wires W1, W2 and W0. The case C is made of flexible resilient material such as neoprene. Other moldable plastic materials may be used providing they exhibit suitable characteristics including resistance to abrasion, good tensile strength and good sealing characteristics.

One part of the case C projects laterally of the wires W1, W2 and W0 to form a suspension tab 10. The tab 10 has a hole 12 reinforced by an eyelet E whereby the tab may be detachably suspended on a hook, a nail or the like. The case C has another part on the opposite side of the projection tab 10 that is substantially tubular, terminating in a flange F. Recessed within the flange is a standard screw socket S, the base end of which is oriented inwardly toward the wires W1, W2 and W0, and the outer open end 13 of which terminates within the flange F.

In order to connect the socket S to the wires W1 and W2, two short leads 14 and 16 are provided. The lead 14 is soldered at one end to the screw thread part of the socket S adjacent the base 18 thereof; its other end connects with a clamp 20 that is crimped or clinched about a bared portion of the wire W1. The lead 16 is connected to the terminal at the center of the base 18 at one end; its other end carries a clamp 22 that is clinched about a bared portion of the other wire W2. The socket S is accordingly wired.

A ground ring R is provided. The ring R is made of heavy conductive material such as brass or copper. It is generally in the form of a sleeve having an internal diameter just slightly greater than the external diameter of the screw part of the socket S. The ring is positioned medially of the socket S and coaxially thereof so as to provide a slight space as at 24 through which the material of the case C extends. The ring R accordingly lies close to the socket and shields it from forces that might crush it.

Yet the ring R is electrically isolated from the socket S. The center portion of the flange is exposed so as to provide a groove 26 (see also FIG. 1) to which the base 28 (FIG. 4) of the bulb cage B may be attached. Thus the base 28 is in the form of a split ring that is telescoped over the flange. The split ring is tightened by a screw 30 whereby a firm mechanical and electrical engagement is effected between the clamp ring and the ground ring R. The ground ring R is internally connected to the third or ground wire W0 by the aid of a short lead 32. One end of the lead 32 is soldered to the upper annular edge of the ground ring R, and its other end carries a clamp that is suitably crimped about a bared portion of the wire W0.

In order to provide access to the wires W0, W1 and W2, the jacket J surrounding the wires is stripped for a short distance. The case is molded about all of the components which are suitably positioned in a mold. The mold is formed to define the flange F together with spaced internal annular grooves G and H. The fluid material forming the case C readily flows through the space between the socket S and the reinforcing ring R. When a light bulb 34 is installed in the socket, its neck flexes the flange F at the region of the grooves G and H so as to provide a tight seal. Any moisture that would otherwise enter along the neck of the bulb is trapped in the grooves G and H and thus isolated from the sockets.

The case has integrally formed braces 38 and 40 (FIG. 2) that serve to stabilize the flange. Forces that otherwise would crush the socket can be sustained without serious consequences.

I claim:

1. A lamp string including a series of spaced socket assemblies, each socket assembly including at least one thin-walled screw socket having a base at one end and an opening at the other; a case partially encapsulating said socket and providing access to the opening of said socket; and a ground ring made of conductive material and located in a closely spaced circumscribing relationship to said screw socket and partially encapsulated by said case, and with the material of said case extending through the substantially circular space between the ring and the socket, said circular space having an outer diameter defined by the inner diameter of the ground ring and having an inner diameter defined by the outer diameter of said screw socket, the ratio of said outer diameter of said space to the inner diameter of said space being not more than about 3/2, said ring having an axial length not less than about half the axial length of said socket, said case exposing peripheral portions of said ground ring for attachment of the clamp or other base of a bulb cage whereby said ring serves to shield said socket while serving as a protective grounding device.

2. The combination as set forth in claim 1 in which three insulated wires extend uninterruptedly through said case, said wires having a common jacket, a portion of which within the case is removed; and three jumper wires all in the case, one of the jumper wires electrically joining one of the through wires to the ring, the other of the two jumper wires joining parts of the socket to the other two through wires; said jumper wires

each carrying clamps at one end constricted to bared portions of the respective through wires, said bared portions as well as said clamps being encapsulated by said case.

3. The combination as set forth in claim 1 in which said case at the region of access to said socket opening is resilient and flexible sealingly to engage the neck of the lamp bulb installed in said socket, said case having internal groove means for trapping moisture at the said lamp neck and forming closed circuitous channel means with the lamp neck at a place located outwardly of the socket.