Feb. 27, 1968 D. MORANDUZZO 3,371,306

LAMP SOCKET AND BULB ASSEMBLY

Filed March 8, 1966

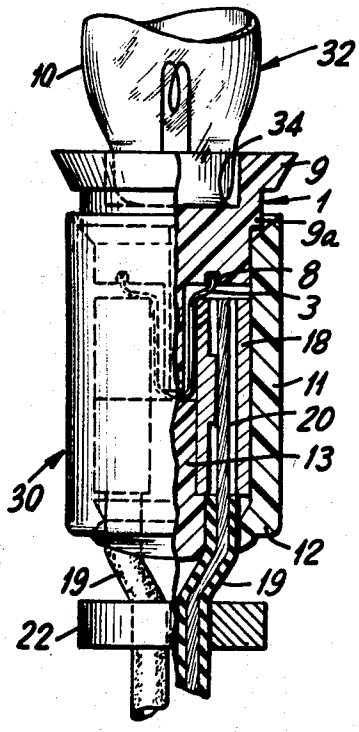


FIG. 1

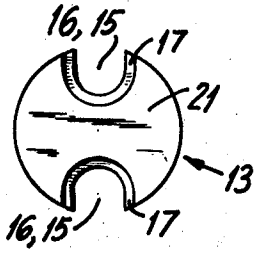


FIG. 3

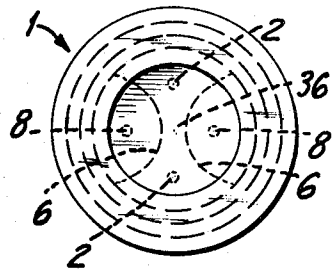


FIG. 5

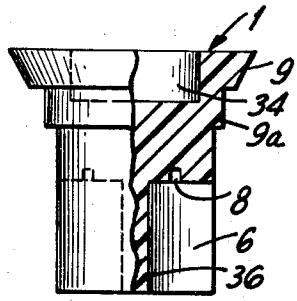


FIG. 4

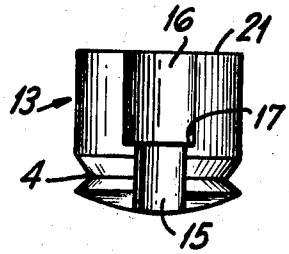


FIG. 2

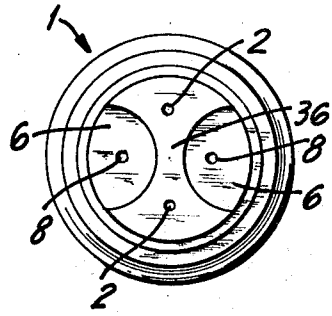


FIG. 6

INVENTOR.
DARIO MORANDUZZO

BY

McMorrow & Torrey

ATTORNEYS.

United States Patent Office 3,371,306
Patented Feb. 27, 1968

3,371,306

LAMP SOCKET AND BULB ASSEMBLY

Dario Moranduzzo, Via Aretina 161, Florence, Italy

Filed Mar. 8, 1966, Ser. No. 532,714
Claims priority, application Italy, June 18, 1965, 14,253/65
3 Claims. (Cl. 339—59)

ABSTRACT OF THE DISCLOSURE

A lamp socket comprises two spaced contact ferrules held between a resilient sleeve and a plug element which is snap-fitted in the sleeve, each ferrule receiving a cable conductor which extends through the plug. Lead wires of a lamp extend through and are positioned along sides of a lamp base portion to make electrical contact with the ferrules when inserted in the sleeve.

This invention relates in general to lamp base and lamp socket construction and in particular to a new and useful lamp socket construction formed by cooperating male and female parts and including means for exposing a conductive terminal within the socket for contact with an exposed terminal formed in a lamp base.

The present invention is particularly applicable for use for small size bulbs or lamps which are without a screw base and which employ exposed terminals which may be directly connected in the socket. Such lamps are particularly used with Christmas tree or decorative light sets and they preferably employ a plug-in connection for the lamp bulb and its associated socket. In order that the bulb be capable of being plugged into a socket, it must have a suitable base formation to permit the connection of the exposed contacts in the socket. Generally, it is necessary to effect connection between the exposed bare terminal wires of the bulb and terminals of two sections of a unipolar cable. The cable is designed to carry any number of sockets in a series and it is then stranded with helical winding with another unipolar cable in order to close the electrical circuit of the light series. All of the plug-in connection constructions which are known at the present time have drawbacks. The most serious are that it is impossible to maintain the lamp bulbs in the sockets or to maintain a proper connection to the terminals of the cable sections. It is also difficult to maintain the proper position of the socket in respect to the connecting cable so that in some instances the connection to the cable becomes severed. In addition, because of the lack of insulation surrounding the cables, it is difficult to use these lines outdoors. In addition to all of this, the manufacturing costs are excessive.

In accordance with the present invention there is provided a socket construction which includes a female socket element having an inner end which is closed by a male socket plug member which is interengaged therewith and locked in position in respect thereto. For this purpose the male member advantageously includes a groove and the female member includes a projection which permits the male element to be received and locked with the female element to close the inner end thereof. The male element is provided with through bores for the connecting cable and a large diameter bore for holding a metal ferrule terminal element in a manner such that it will easily contact the exposed bare wire of a lamp received in the socket. The inventive construction further includes a lamp formation with a base portion having a central projection of insulating material with bores defined therethrough for the passage of the base terminals of the lamp bulb and with means for anchoring the ends of the cable around the central projection so

that they will easily be contacted by the metal ferrule of the socket member. With a construction of this nature the disadvantages of the prior art are eliminated.

Accordingly, it is an object of the invention to provide an improved socket construction for plug-in lamps which includes an outer substantially cylindrical female socket portion which is closed at one end by a plug member of insulating material which has bores defined therethrough for the passage of the connecting cable and which includes a seat for a ferrule terminal which is connected to each cable and arranged so that it projects on the interior of the socket for easy connection to an exposed cable of a lamp.

A further object of the invention is to provide a lamp socket and a lamp base which may be interengaged in a plug-in connection in a simple manner.

A further object of the invention is to provide a lamp socket which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a partial elevational and partial transverse sectional view of a lamp socket constructed in accordance with the invention;

FIG. 2 is an elevational view of the socket plug member;

FIG. 3 is a top plan view of the plug member of FIG. 2;

FIG. 4 is a partial elevational and partial sectional view of the lamp base;

FIG. 5 is a top plan view of the base indicated in FIG. 4; and

FIG. 6 is a bottom plan view of the base indicated in FIG. 4.

Referring to the drawings in particular, the invention embodied therein comprises a lamp socket generally designated **30** for receiving a plug-in type of lamp bulb generally designated **32** which includes, in the embodiment illustrated, a bulb portion **10** and a base portion **1**. The base portion of the lamp bulb is made of an electrical insulating material such as a synthetic plastic material and is of substantially cylindrical form being formed with an upper shoulder **9** and an intermediate shoulder **9***a*. The top of the lamp base **1** includes a cavity **34** for receiving the lamp bulb **11**. A substantially rectangular central projecting portion **36** extends downwardly from the base **1** and is provided with through bores **2, 2** on respective opposite sides thereof for the passage of the bare wire terminals **3** of the light bulb **10**. The terminals **3** are bent around the lower end of the projection **36** and are extended upwardly along the respective opposite sides of the projection and anchored in recesses **8** defined on the underside of the remaining portion of the base **1**. The vertical grooves or cavities **6, 6** defined on each side of the central projection **36** have curved interior surfaces for facilitating the reception of contact elements of cylindrical configuration which are formed in the socket **30**.

The socket **30** as indicated in FIG. 2 comprises a main body or socket **11** of thermosetting plastic material substantially in the form of a hollow cylinder having a lower internal annular ledge **12** projecting inwardly which engages in an annular groove **4** of a clamp insulator generally designated **13**. The clamp insulator is made of synthetic plastic material and is of substantially cylindrical form and dimensioned so that it may be force-fitted with-

in the socket **11**. The insulator **13** includes two vertical cylindrical bores **15** which extend upwardly from its lower end for accommodating cables **19, 19**. A widened diameter cylindrical bore **16** is defined above the bore **15** so that an arc-shaped step or ledge **17** is defined therebetween for supporting a metal contact element or ferrule **18**. The ferrule **18** is made of a brass or other material of good electrical conductivity and is mechanically fixed to the wires or terminals of the cables **19, 19**. A direct electrical connection is obtained between the ferrule **18** and the electrical conductors **20, 20** within the cables **19**. The ferrule is of a construction so that the electrical connection may be made without having to bare the covering around the conductors. The ferrule **18** is retained on the seat formed by the ledge **17** without any possibility of dislodging during the traction of the cables **19** as a result of their stranding with other line cables of the light series. The ferrules **18** are dimensioned to project upwardly from the top edge **21** of the insulator **13** and are held within the cylindrical grooves **6** of the lamp base **1** when the latter is inserted into the socket. In this manner the ferrules **18** bear against the bare wires **3** and obtain a secure and permanent electrical contact therewith.

The cables which enter the sockets through the insulator **13** are advantageously held together by a ring **22** which is positioned around the cables and not welded thereto. In some instances it is preferable to replace the ring **22** by the knotting of the cables directly below the insulator in order to obtain proper orientation with the socket.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A lamp socket and bulb assembly comprising a substantially cylindrical resilient outer body having openings at each end and an inwardly directed interior substantially annular ledge adjacent one end, a substantially cylindrical insulator plug having an inner portion and a cylindrical base wider than said inner portion and with a substantially annular recess on a side thereof, said plug being force-fitted into one end of said cylindrical body with the ledge of said body engaged in the annular recess of said plug base, said plug having a cavity defined inwardly from each side extending from the said plug inner portion to said base, a bore defined through said base from each cavity to the exterior of said base, a rigid ferrule of a length substantially greater than said plug inner portion supported on said base in each of said cavities and projecting beyond the end of said inner portion, an electrical cable extending through each of said bores and each having a conductor extending through said ferrule and secured to said ferrule, a lamp engaged within said socket having a lamp base portion with a central projection disposed between said ferrules, two electrical bulb contacts extending from said bulb through said lamp base portion and through the central projection with respective ones of said bulb contacts extending up along the outside of each side of said central projection and tightly engaged against respective ones of said ferrules along a substantial portion of the length thereof.

2. A lamp socket and bulb assembly according to claim **1** wherein said base of said lamp includes a recess therein on each side of said projection at a location spaced outwardly from said projection, said bulb contacts having their ends disposed in respective recesses of said base in a position at which each is in alignment with the end of said ferrule.

3. A lamp socket and bulb assembly according to claim **1** including a ring member exterior of said assembly having a bore therethrough for each cable, said cables being threaded through respective bores of said ring member, said ring member being slidable along said cables toward said base to hold said cables in position by wedging action with said base.

References Cited

UNITED STATES PATENTS

2,306,206	12/1942	Dalgleish.	
2,941,181	6/1960	Fraser et al.	339—206 X
2,984,813	5/1961	Bossi	339—213 X
3,104,924	9/1963	Capel	339—176 X
3,233,207	2/1966	Ahroni et al.	339—145

FOREIGN PATENTS

566,099	11/1923	France.
639,028	5/1962	Italy.

RICHARD E. MOORE, *Primary Examiner.*