HOLDING MEANS FOR MINIATURE BULBS

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

SABURO SUZUKI
INVENTOR.

by

Eliot S. Herber
ATTORNEY.
ABSTRACT OF THE DISCLOSURE

A bulb holder of synthetic resin is adapted to hold a small sealed glass bulb having two wires which protrude through its bottom wall. The holder comprises, in combination, a bulb holding member and a sleeve tightly fitted around it. The pair of conductive wires protruding from the bottom of the miniature bulb are bifurcated and tightly fitted into vertical slits in the holding member. The end portions of the conductive wires are tightly interposed between the holding member and the sleeve. The bottom of the bulb fits into a concavity in the top portion of the holding member. The bulb will be thus retained upright. The conductive wires are in electrical contact with external wires within said slits, or between the holding member and the sleeve, or both wires are electrically connected by means of metal plates interposed between the holding member and the sleeve.

The present invention relates to electrical light bulb sockets and more particularly to a holding means for miniature light bulbs.

Conventional miniature light bulbs, for example, for Christmas tree decoration, have metal bases, the bulbs being screwed into cooperating metal sockets. The metal bases may be attached to the glass bulbs with adhesives. The bases are often accidentally detached from the glass bulbs. Difficulties have also been experienced in establishing electrical contact between the metal base and the socket. Although various suggestions and proposals have been made to eliminate the foregoing difficulties, none of these suggestions or proposals has been completely satisfactory or successful.

It is therefore an objective of the present invention to provide holding means for miniature bulbs, the bulbs having a pair of conductive wires protruding directly, i.e., without a base, from their bottom walls.

It is a further objective of the present invention to provide holding means for miniature bulbs wherein the electrical contacts are secure and the bulbs will remain erect.

It is another objective of the present invention to provide holding means for miniature bulbs which can be constructed easily and relatively inexpensively.

In accordance with the present invention, a bulb holding member of an elastic (springy) synthetic resin is provided. The plastic member has, in its central top portion, a concavity into which the bottom of a glass bulb fits. The bulb has a pair of conductive wires directly protruding from its bottom wall, the bottom being hemisphere shaped. Two slits are vertically formed substantially in the center of the concavity. Each slit extends increasingly deep, from the center of the concavity to the outside of the bulb holding member. The slits are thinner than the protruding wires of the bulb. The respective conductive wires of the bulb are tightly fitted and held down in the slits as the sides of the slit are elastic. The bottom of the bulb is fitted into the concavity and the bulb is positively held erect.

With reference to the electrical contact between the conductive wires of the bulb and the outside external wires, the conductive wires are in permanent electrical contact with the naked end portions of the outside wires. In one embodiment, the outside wires pass through a vertical hole positioned substantially in the center of the bulb holding member. The end portions of the conductive wires and the naked portion of the external wires, both protruding from the slits, are fixedly interposed between the bulb holding member and a sleeve tightly fitted around the bulb holding member. Alternatively, a bulb holding member has, instead of the central vertical hole, two vertical slots in the outside surface thereof through which the outside wires pass. The holding member has two frames into which conductive terminal plates are respectively fitted. The terminal plates have respectively small holes through which the naked portions of the outside wires respectively pass and are folded back without the process of soldering or caulking. The conductive wires of the bulb are respectively in electrical contact with the terminal plates. In this embodiment, too, the sleeve is tightly fitted around the bulb holding member. The covered portions of the outside wires are respectively tightly interposed between the side wall of the bulb holding member and the sleeve. The naked portions of the outside wires are respectively fitted into the slits. The conductive wires are thus electrically connected with the outside wires. In the constructions of the present invention, the outside wires cannot be pulled out in use.

Other and more particular objectives of the invention will be manifest upon study of the following description, when taken together with the accompanying drawings.

In the drawings:

FIG. 1 is a side view of a miniature bulb of the type which is adapted to be fitted in the bulb holding means embodying the present invention;

FIG. 2 is a front view of the first embodiment of the bulb holding member of the present invention;

FIG. 3 is a vertical sectioned view of the same embodiment according to FIG. 2;

FIG. 4 is a vertical sectioned view of the first bulb holding member as shown in FIGS. 2 and 3 together with the bulb of FIG. 1 mounted thereon;

FIG. 5 is a front view of the second embodiment of the bulb holding member embodying the present invention;

FIG. 6 is a vertical sectioned view of the same embodiment according to FIG. 5;

FIG. 7 is a vertical sectioned view of a bulb holding means embodying the invention in its final assembly together with the bulb of FIG. 1 mounted thereon;

FIG. 8 is an explanatory view showing another bulb holding means prior to its assembly;

FIG. 9 is a vertical sectioned view of the bulb holding means according to FIG. 8 in its final assembly together with the bulb of FIG. 1 mounted thereon.

In FIG. 1, the miniature bulb 1 adapted to be fitted in the bulb holding means embodying this invention does not have a base attached thereto. The bulb 1 is formed from a glass tube and the bottom thereof is hemisphere in shape. Two conductive wires 2 and 2' protrude directly through the glass wall at the bottom of the bulb 1.

In FIGS. 2 and 3, a bulb holding member 3, cylindrical in shape, has in its top portion a hemisphere shaped cavity 4 positioned substantially in the center of the cylindrical holding member 3. The size and shape of the hemisphere cavity 4 is substantially equal to the size and shape of the bottom of the glass tube 1. This bulb holding member 3 is elastic, electrically insulating and
therefore preferably of a synthetic resin such as polyethylene. Slits 5 and 5' are vertically formed in the center of the cylindrical holding member 3. The slits 5 and 5' are at their central parts as deep as the deepest portion of the hemisphere cavity 4 and respectively extend increasingly downward from the center to the outside of the holding member 3.

As is evident from FIG. 4, when the conductive wires 2 and 2' are respectively fitted into the slits 5 and 5' and then are equally strained, the miniature bulb 1 will stand upright, the bottom thereof being just fitted into the cavity 4. The wires 2 and 2' are preferably larger in diameter than the width of their slits 5 and 5', so that the elastic force of the material forming the slits retains the wires in place.

As shown in FIG. 5, the bulb holding member 13 is similar to the described holding member 3 in that it has the hemisphere cavity 14 and the slits 15 and 15'. The holding member 13 has, however, a vertical hole 16 penetrating through the center portion thereof. The reference numeral 19 denotes a solid partition whereon the bulb 1 is mounted. The partition 19 is designed so as to avoid the electrical contact between the naked portions of the outside wires. The interspaces between the partition 19 and the bulb holding member 13 are as shown in FIG. 7, designed so that the outside electrical wires extend through them.

In FIG. 7, the naked portions of the covered wires 17 and 17' respectively pass through the vertical hole 16 and the interspaces between partition 19 and the holding member 13. The wires 17 and 17' are then fitted into the slits 15 and 15' and finally are curved downward along the outside surface of the holding member 13. Meanwhile, the conductive wires 2 and 2' of the bulb 1 are respectively fitted tightly into the slits 15 and 15' and similarly curved downward along the outside surface of the holding member 13. Finally, the conductive wires 2, 2' and the naked portions of the covered wires 17, 17' are tightly retained by means of the tubular sleeve 18 within the slits and may also be held together in contact by the pressure exerted by the sleeve 18. Alternatively, the bulb wires 2 and 2' may be soldered or otherwise adhered to their respective external wires 17 and 17' before the sleeve 18 is fitted over the holding member 13. The wires 2 and 2' are positively kept in electrical contact with the naked portions of the wires 17 and 17'. The sleeve 18 is preferably of an elastic plastic resin.

In FIGS. 8 and 9, the bulb holding member 23 is similar to the bulb holding member 13 illustrated in FIG. 7 in that it has the hemisphere cavity 24 and the slits 25 and 25'. The bulb holding member 23 has two vertical outside slots 26 and 26'. The external wires 27 and 27' pass through the slots 26 and 26'. Terminal plates 29 and 29' are positioned and retained with frame portions forming the respective slots 26 and 26'. The frame portions 31 and 31' of member 23, the frame portions forming the respective slots 26 and 26'. The bulb will be held upright. The end portions of the conductive wires 2 and 2' are respectively in electrical contact with the terminal plates 29 and 29'. The bulb holding member 23 is, in the final assembly, tightly fitted in the sleeve 28.

While only the preferred embodiments of my invention have been shown, it should be understood that various changes or modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

1. A bulb holding means of a synthetic elastic plastic resin adapted to hold erect a bulb, said bulb having a rounded bottom wall and a pair of conductive wires protruding from said bottom wall, said holding means comprising, in combination, a holding member and a sleeve tightly fitted around the said holding member, wherein the said holding member has in the top portion thereof a central concavity of substantially the same size and shape as the bottom of the said bulb and a pair of slits joining said central concavity with the external wall of said member, and wherein the said sleeve is tubular and fits tightly over the external wall of said holding member and over said conductive wires of said bulb, whereby the conductive wires may be separated and respectively tightly fitted into said slits and the bulb may be retained upright.

2. A bulb holding means as claimed in claim 1, wherein said vertical slits are increasingly deep from the said central concavity to the exterior surface of said holding member.

3. A bulb holding means as claimed in claim 1, wherein the holding member has a vertical hole positioned substantially in the center thereof so that outside wires may pass through the vertical hole and may be separated and be tightly fitted into said vertical slits.

4. A bulb holding means as claimed in claim 3, wherein the holding member has a partition positioned substantially in the center of said concavity so that the electrical contact between naked portions of outside wires may be prevented.

5. A bulb holding means as claimed in claim 1, wherein the holding member has vertical outside slots so that outside wires may respectively pass through the vertical slots.

6. A bulb holding means as claimed in claim 5, wherein conductive terminal plates are interposed under compression between the holding member and the sleeve and respectively electrically connected with said conductive wires and said outside wires, and said holding member has a means for retaining said terminal plates.

7. A bulb holding means as claimed in claim 6, wherein said terminal plates have respectively a means for retaining said outside wires so that it may not be pulled out.

8. A bulb holding means as claimed in claim 6, wherein said retaining means is a hole in each of the said plates.

References Cited

UNITED STATES PATENTS

2,231,347 2/1941 Reutter 339—62 X

FOREIGN PATENTS


RICHARD E. MOORE, Primary Examiner.