United States Patent [19]

Schumacher

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[45] **June 25, 1974**

[54] **SEAL OFF AROUND GE3952 LAMP**

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[52] **U.S. Cl.** ..... **240/1 R,** 240/52.1, 313/312

[51] **Int. Cl.** **F21v 21/08**

[58] **Field of Search** ..... 240/1 R, 52.1; 313/312, 313/315, 317, 318; 339/144 R, 145 R

[56] **References Cited**

UNITED STATES PATENTS

2,692,374 10/1954 Carson ..... 240/10 T

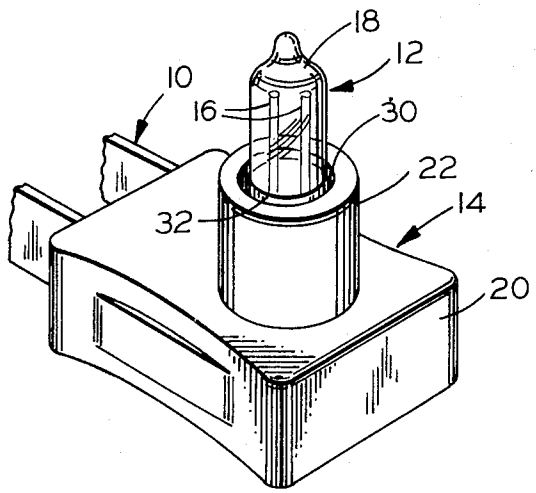
Primary Examiner—Richard L. Moses

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[57] **ABSTRACT**

A plug in guide light is provided having a molded thermoplastic body, and having power blades and a glow lamp extending from and supported by the body. The power blades are parallel to each other and generally normal to the axis of the glow lamp. The support of the lamp is improved and the extrusion of flash around the lamp is restricted by formation of an annular well in the body at the base of the glow lamp.

5 Claims, 7 Drawing Figures



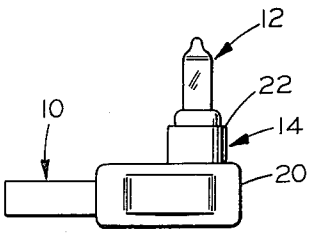


FIG. 1
(PRIOR ART)

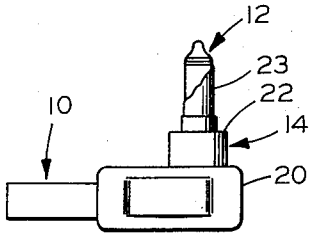


FIG. 2
(PRIOR ART)

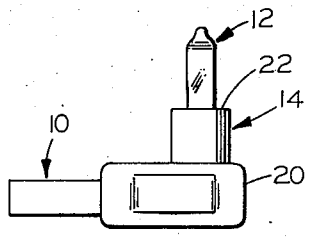


FIG. 3

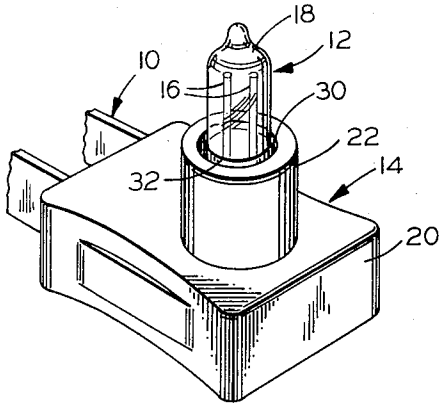


FIG. 4

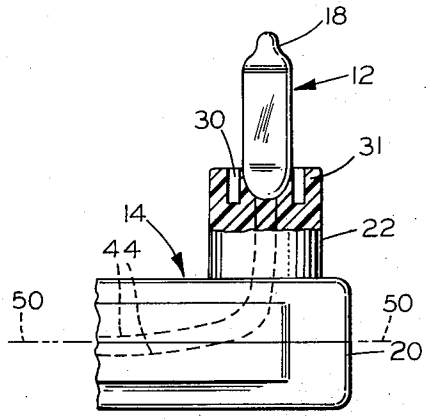


FIG. 5

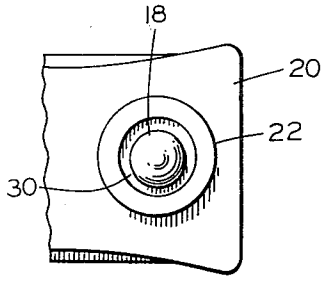


FIG. 6

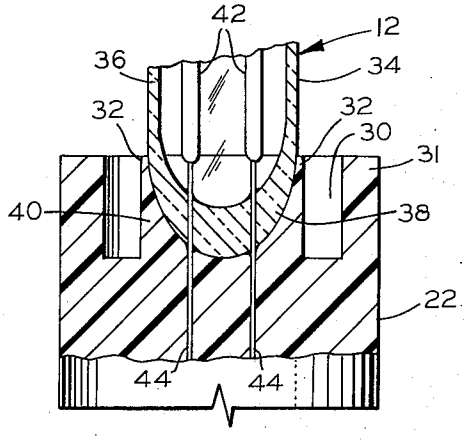


FIG. 7

SEAL OFF AROUND GE3952 LAMP

BACKGROUND OF THE INVENTION

This invention relates generally to the method of mounting of a low level electric light source in a plastic molded body and to the article formed. More particularly, it relates to such a light source and body which has been integrally formed, with the light source supported by the plastic body, and with a pair of conventional parallel blade power contacts suitable for insertion into conventional wall receptacles also supported by the plastic body.

An article of the type illustrated in the figures of the drawing of this application, has extensive use in providing a relatively low level continuous illumination at a wall receptacle into which the power blades of the device are plugged. Various decorative elements may be combined with the device, but these decorations are usually in the form of decorative additions which are added to, or affixed to, a base as described and illustrated in this application. This base to which various decorative elements may be added includes a molded plastic body and a pair of parallel blades extending in one direction from the body and a light source, usually a glow lamp, extending in another direction from the body. As is also evident from the accompanying drawing, including the figures of the drawing labelled as prior art, the glow lamp bulb usually extends at right angles to the direction of extension of the power blades.

The manufacture of such an article has always presented a problem in that there is a relatively high level of breakage of the lamp article and particularly of the glass envelope of the lamp so that appreciable scrap is produced in the normal production of this article.

Another problem which has been encountered in the production of an article illustrated as prior art in the drawing is a tendency for the molded plastic which is molded directly about the ends of the power blades, and directly about the held end of the lamp, to surge up around the lamp and to form a jacket or partial jacket of the body material, referred to as "flash" around the lamp. Such a jacket of flash is not only unattractive but it partially hinders the passage of light from the lamp. This problem of jacket formation results partly from the facts that lamps themselves form part of the closure of the mold into which the molten plastic is "shot" or expressed in the molding process and that the lamps are not of uniform dimensions or shape.

In the molding operation, the fused plastic material envelops or partially envelops three elements of the guide light product. It envelops the held end of the power blades, all of the electrical connections between the power blades and the lamp, and the held end of the lamp itself. The article formed by this molding operation is well known in commerce and the article has been produced for a number of years and sold as a component part of commercial guide lights of various descriptions.

Attempts to reduce the amount of breakage and to eliminate the amount of flash which is formed up around the lamp of the device have heretofor met with only limited success. One reason, as indicated above, is that the commercially available lamps themselves are not of sufficiently uniform dimensions or shape to provide an adequate closure for the mold in which the article is formed. Another reason is that the cost of obtaining lamps of such uniform dimensions and shape is quite high and leads to an undesirable increase in the cost of the final products.

The articles shown in the first and second figures of the drawing of this application illustrate prior art devices which were known and which were commercially available prior to this invention. These two figures illustrate the two forms in which prior art devices are known to have been produced. FIG. 2 of the drawing illustrates the flash which is formed up and around the lamp in greater or lesser degree in most of these little guide light articles which have been produced heretofore. It is believed that by very careful dimensioning of the lamp bulb or by very careful selection of bulbs of the proper dimensions that articles could be produced without such flash as illustrated in FIG. 1 of the drawing of this application.

Other articles formed by molding plastic about lamps have also been known heretofore and some of these are disclosed in reference patents such as U.S. Pat. Nos. 2,632,232, 3,077,022, 2,934,792, 2,692,374 and 2,969,479 the last being assigned to the same assignee as this application. However none of these patent references concern themselves with the problem of prevention of flash formation or reduction of lamp breakage as discussed above with reference to the prior art devices illustrated in the drawing.

OBJECTS OF THE INVENTION

It is accordingly one object of the present invention to provide a plug-in guide light article which is less susceptible to breakage in manufacture than prior art devices.

Another object is to provide a plug-in guide light article which has improved lamp support including reduced flash covering the lamp portion thereof.

Another object is to provide a method of forming a plug-in guide light article which results in the production of lower scrap rate.

Still another object is to provide a method of manufacture of a plug-in guide light article which has less flash formed about and obscuring passage of light from an exposed glow lamp of the article.

Other objects and advantages of the invention will be in part apparent and in part pointed out in the description which follows.

SUMMARY OF THE INVENTION

The present invention in one embodiment thereof provides a plug-in guide light article and a method of making the article.

The article includes a body of plastic, the plastic being molded about portions of the electrical components of the guide light.

The electrical components include a pair of power supply blades having plastic molded about held ends, the blades being parallel and spaced for insertion in a conventional wall receptacle.

They also include electrical connections entirely encased within the molded body and extending from the held ends of the power blades to the held end of a lamp. The lamp itself has plastic molded about it's held end but is free of plastic extending up and around the side walls of the lamp.

The article is formed by providing a closeable mold introducing the electrical parts into the mold, including introducing the lamp into a conforming well of the

mold, the well having of a depth at least equal to the length of the lamp, closing the mold and introducing molten thermoplastic into the mold.

The description is made clearer by reference to the accompanying drawing in which:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view of a plug-in guide light article as provided pursuant to the prior art.

FIG. 2 is a similar view of a prior art guide light article as in FIG. 1 but illustrating a partial jacket of flash up around the glow lamp thereof.

FIG. 3 is a similar view of a guide light produced in accordance with the present invention.

FIG. 4 is a perspective view of a guide light article as illustrated in FIG. 3 and illustrating the relation of the lamp to a trough in the body member.

FIG. 5 is a side elevation in part in section of a part of a guide light article as shown in FIG. 3.

FIG. 6 is a top plan view of a part of a guide light article as shown in FIG. 5.

FIG. 7 is a detailed view in part in section of details of the glow lamp base and the support therefor as illustrated in FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, there is shown in FIGS. 3 through 7 a form of the plug-in guide light article which is formed pursuant to the present invention. The type of device to which this invention applies is comprised of four basic general elements including:

a pair of power blades **10**;

a glow lamp **12**;

a molded plastic body **14** which is molded about and supports the blades **10** and lamp **12**;

and electrical interconnections between the lamp **12** and the blades **10** which are encased within the plastic body **14** and are shown in phantom in FIG. 5.

The lamp **12** may be of the conventional glow lamp type having two electrodes **16** within a glass envelope **18.** The molded plastic body **14** is made up of an integrally formed generally rectanguloid base **20** and a generally cylindrical pedestal **22.** To the extent described thus far, the plug-in guide light article of FIG. 3 through 7 corresponds to the articles shown in FIGS. 1 and 2 of the drawing as prior art devices. What is distinct about the article of this invention is illustrated in the details of FIGS. 4 through 7 and principally of FIGS. 5 and 7.

In the prior art devices of FIGS. 1 and 2, there is a pedestal **22,** which may be in a variety of forms as shown, extending up from the base **20** of body **14** with which pedestal **22** is integral. The pedestal provides a support about the lower end of the glow lamp **12.**

The pedestal **22** is formed of the same plastic as that of base **20,** which is the remainder of body **14,** and is formed integrally with base **20** inasmuch as the plastic is introduced into a single mold in its molten state in forming both the base and the pedestal of the body member. The molten plastic is also introduced around the supported end of the glow lamp **12.** In production of prior art devices, the molten or fused plastic can, and in most cases does, extrude up around the sides of the glow lamp as illustrated in FIG. 2 to form the upwardly extending collar or jacket of flash **23.**

Two principal problems were involved in manufacture of articles of the type shown in the figures. A first problem was the tendency toward breakage of the glow lamp itself and the second was the formation of the jacket of flash such as **23** up and around the lamp. This jacket of flash reduces passage of light from the lamp and gives the product an unsightly or unfinished appearance.

What is principally distinct in the new construction illustrated in FIGS. 3 through 7 from that illustrated in FIGS. 1 and 2 is that the pedestal itself is increased in height but an annular well or trough is provided in the upper surface of pedestal **22** at the supported end of the lamp **12.** The greater overall outer height of the pedestal may be seen from a comparison of the pedestal of FIG. 3 with those of FIGS. 1 and 2. The actual inner structure may be best described with particular reference to FIGS. 5 and 7 which are respectively more general and more detailed sectional views of the upper portion of the pedestal **22** and the lower portion of the lamp **12.** AS illustrated, the annular well extends down into the pedestal **22** to a depth approximating the depth to which the base of the glow lamp **12** itself extends into the pedestal **22.** Further, it is evident that the inner diameter **32** of the annular well **30** is very close to but slightly larger than the outer diameter **34** of the glow lamp **12.**

It is evident from illustrations of the devices of FIGS. 1 and 2 that the bodies of plastic in contact with the lower portion of the respective lamps have diameters appreciably larger than those of the lamps held by such bodies.

This inner diameter **32** of annular well **30** also corresponds to the inner diameter of a well of a mold, not shown, into which the lamp **12** is inserted prior to the molding operation and in which it is held during the molding operation. This well of the mold employed in forming articles as illustrated in FIGS. 3 through 7 has a diameter corresponding to the diameter of a similar well of a mold employed in forming the articles of FIG. 2 having high breakage as well as having the flash illustrated in FIG. 2. Moreover, the differences in dimensions among various glow lamps used in forming the improved devices of FIGS. 3 through 7 are not significantly different from those of glow lamps used in production of the prior art devices shown in FIGS. 1 and 2.

However, surprisingly, although the mold well diameter is essentially the same, no flash is produced up around the side walls of lamp **12** and an **80%** to **90%** reduction in breakage of lamps has been found.

It is not known precisely why the flash does not form nor precisely why the breakage is reduced, particularly inasmuch as the lamps which are used in production of the essentially flash-free form of this guide light, are approximately the same both in average dimensions and in variations in dimensions as those used in the formation of prior art flash bearing devices, such as illustrated in FIG. 2.

A further distinctive feature of the article as illustrated in FIGS. 3 through 7 from those of the prior art, is that although the glow lamps employed in forming articles as shown in FIGS. 3 through 7 are of the same overall length as those used in prior art devices, there can be a greater exposed length of the glow lamp from which light can be emitted. In other words, the amount of the light emitting length of the lamps which is ex-

posed can be greater in the newer improved glow lamp plug-in guide light article than in the prior art devices. One reason for this is that the pocket in the mold into which the bulbs were inserted prior to molding is longer in the new devices of FIGS. **4** through **7** than in a prior art device such as that of FIG. **2.** The result of lengthening the pocket is that the molten plastic which forms the grip on the lower end of the lamp is in contact only with the end of the lamp whereas in some prior art devices, greater contact with the side walls of the lamp occurred. One result is that the molten plastic which is brought into contact with the end of the bulb under pressure acts principally against the portion of the bulb which is strongest and accordingly, which is most capable of withstanding the applied combined heat and pressure. As a result of this and other changes as outlined above, there is an **80%** to **90%** reduction of breakage of the lamps as compared to production of prior art devices as illustrated in FIG. **2.**

This difference in glass thickness is illustrated best in FIG. **7** where the upper portion of pedestal **22** and the lower portion of conventional lamp **12** are shown partially in section. The conventional lamp is seen to have thinner sidewalls **36** and a thicker base portion **38.** As is evident from FIGS. **5** and **7,** portions of the molten plastic contacts the surface of the lamp as the molded body **14** is formed. This portion includes the ring **40** of wedge shaped plastic between the trough **30** and the lamp **12.** It is accordingly part of this invention that contact of molten plastic is made only with that portion **38** of the lamp having the thicker glass.

This reduced contact of plastic and glass is distinct from the structure illustrated in FIGS. **1** and **2** and is deemed to contribute in part in the reduced breakage achieved in forming the articles as illustrated in FIGS. **3** through **7.**

The two glow electrodes **42** are seen to be housed within the glass envelope **36** of the lamp and the two lead wires **44** extending down from the electrodes **42** pass both through the lower thicker portion **38** of the lamp **12** and through the molded plastic of pedestal **22.**

As is evident from the foregoing, the present invention provides a novel article having an improved support for the lamp thereof. It is also evident that this novel article is formed by a novel method.

The novel method involves providing an openable mold. A preferred location at which the mold can open to produce an article as described above is along the dashed and solid line **50** as seen in FIG. **5.** The upper half of such a mold is actually inverted when the article is formed. When the mold is open, the lamp is inserted in a well in the mold which mold well has a diameter conforming closely with that of the lamp.

The electrical leads **44** from the lamp are positioned in the mold cavity where they will be embedded in the molten plastic when the mold is filled with such molten plastic. The blades **10** are placed in conforming slots at a side of the mold to extend partly in and partly out of the mold cavity and accordingly are embedded in the plastic body only at their inner or held ends during the molding process.

The lamp according to the present method is placed in a mold well having a depth at least equal to the length of the lamp to be held in the well. The upper end of the well is in the form of a collar extending into the mold cavity so that during the molding process, molten plastic is extruded into place on both sides of this collar. A portion of the molten plastic is extruded in the form of a tapered annular ring **40** into contact with the end section of the lamp where the thicker glass wall **38** is located. Another portion of the molten plastic is extruded into an annular outer well of the cavity and forms an outer rim **31** of the pedestal **22** of the guide light article.

The two upper portions **40** and **31** of the pedestal **22** are formed integrally with the pedestal and the pedestal is formed integrally with the base **20.**

In practicing the method of the present invention, an open mold is first loaded with the lamp, interconnecting conductors and power blades. Then the mold is closed and the molten plastic is introduced into the mold. The mold is cooled according to conventional thermoplastic molding practice and the molten plastic forms a unitary plastic body as it is cooled within the mold. The portion of the mold which forms the annular well of the finished article may be described as a barrier in the sense that flow of molten plastic up into the lamp well of the mold is restricted where this element of the mold is present. It is not known precisely why the presence of this element results in restriction of plastic flow and it is accordingly referred to as a barrier although the mechanism by which the restriction of plastic flow occurs is not understood.

What is known is that the height of the outer rim of the pedestal is itself appreciably greater than those of the prior art; that an annular well separates this taller outer rim from the interior portion of the plastic which contacts the held end of the lamp; and that the portion of the plastic body beneath and surrounding and supporting the held end of the lamp is smaller than those of prior art devices.

What is claimed as new and desired to be secured by letters Patent of the United States is:

1. A plug-in guide light article which comprises,
- a parallel pair of power blades,
- a glow lamp, said glow lamp being elongated and generally cylindrical and having a longitudinal axis,
- electrical connections from said blades to said lamp to supply electric power to said lamp,
- a body of plastic, said plastic being molded about said electrical connections and about held ends of said blades and lamp,
- said lamp extending out of and being supported by said plastic body at the held end of said lamp,
- an annular trough in said plastic body said trough being concentric to the long axis of the lamp and being formed proximate the outer perimeter of the glow lamp.

2. The article of claim **1** wherein the depth of the annular trough is approximately equivalent to the depth of extension of the glow lamp into the pedestal.

3. The article of claim **1** wherein the plastic bears against only the thick walled portion of the lamp.

4. The method of manufacturing a plug-in guide light including an elongated glow lamp,
- a pair of parallel power blades extending at right angles to the longitudinal axis of said lamp and electrically connected to the leads of said lamp,
- and a molded unitary plastic body formed about the adjacent portions of said lamp and blades and including a base portion encapsulating the interconnecting blades and lamp leads,

and a pedestal portion encapsulating the lower end of said lamp, comprising the steps of

predeterminately arranging the previously interconnected blades and lamp in a mold having a base forming section, a section for forming a perpendicular pedestal on the base, a lamp receiving pocket in the bottom of the pedestal forming section, and of such depth as to locate only a predetermined limited portion of the inner end of the lamp in the pedestal forming section of said mold, and an annular barrier in the bottom of said pedestal forming section concentric with said pocket and spaced from both said pocket and the outer wall of said pedestal forming section,

and introducing plastic body forming material into said mold whereby said unitary plastic body is formed and said barrier is effective for avoiding extrusion of appreciable plastic material beyond the bottom of said pedestal forming section of said mold, thereby to avoid the undesirable presence of plastic flash on said lamp outwardly of the end of said pedestal portion of said body.

5. A plug-in guide light manufactured according to the method of claim **4** and characterized by a glow lamp free of plastic flash outwardly of the end of the pedestal of the light body.

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