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REAR LOADING PANEL LAMPS AND A METHOD OF BASING THE SAME

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Fig. 1.

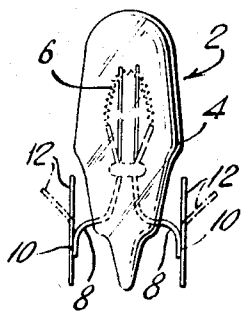
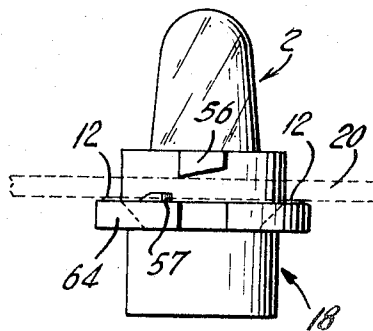


Fig. 2.



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REAR LOADING PANEL LAMPS AND A METHOD OF BASING THE SAME

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3 Claims

ABSTRACT OF THE DISCLOSURE

A permanently-based rear-loading panel lamp is formed to enclose all lead wires, exposing only the electrical contact which press against the circuit contact points on the circuit board in which the lamp is mounted. The portion of the lamp enclosed by the base is abutted over its entire surface by the molded base to form a rigid lamp assembly.

The present invention relates to rear loading panel lamps and more specifically to a novel rear loading panel lamp with a permanent base of thermoplastic insulating material.

Rear loading panel lamps are employed in printed circuit panels wherever there is a need for illumination or a visual signal. The panel lamps currently available consist of a wedge lamp having wire leads and a separate fixture into which the wedge lamp is inserted and mechanically based. The separate fixture includes a spring loaded clamp which normally holds the wedge lamp in position and provides an electrical connection for the leads of the wedge lamp. The spring loaded clamp also has a terminal portion which extends between the envelope of the wedge lamp and the rim of the separate fixture to provide a means for electrically connecting the wedge lamp to the printed circuit panel. The combined assembly of the wedge lamp and fixture can be mounted in a printed circuit panel by rear inserting it into a suitable aperture formed in the panel.

Mechanically based wedge lamps have proved unreliable as panel lamps because they have a tendency to dislodge due to rough handling or wear of the spring loaded clamps. Furthermore, the individual wedge lamps are more expensive to manufacture than the standard wire or butt sealed lamp and each wedge lamp must be hand inserted into its associated fixture.

A novel means for increasing the reliability and reducing the costs of rear loading panel lamps is to permanently mold a thermoplastic base fixture directly to a wire or butt sealed lamp. The resulting product is a low cost integral panel lamp unit which can be easily rear inserted into the aperture of a printed circuit panel.

Thus, in accordance with the present invention, a novel rear loading panel lamp is provided which lamp comprises a standard wire lamp having a thermoplastic base molded permanently thereon. The method of producing the new rear loading panel lamp consists of securing a pair of terminals to the external leads of the wire lamp and introducing the assembly into a suitable mold. Having a mold cavity, the rigid walls of which conform in shape to the base to be formed. Thermoplastic material is injected into the mold cavity under pressure of approximately 15,000 p.s.i. and at a temperature of about 500° F. After the thermoplastic material has cooled and hardened, the mold is opened and the based lamp is removed. The mold is then ready for the reception of another wire lamp upon which a base is to be formed. This new molding process employs injection molding techniques which eliminate the protracted cooling time and mixing of components normally associated with epoxy materials. In

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addition, injection molding permits the use of a mold cavity having rigid walls rather than resilient walls and thus uniform dimensioning of the base is assured.

For a better understanding of the invention and the advantages thereof, reference may be had to the accompanying drawings in which:

FIG. 1 is a front view of a standard wire lamp with terminals secured thereto prior to the forming of a thermoplastic base thereon in accordance with the present invention;

FIG. 2 is a front view of a completed based lamp manufactured in accordance with the invention.

Referring to FIG. 1 of the drawings, a standard wire or butt sealed lamp 2 is shown which includes an envelope or bulb 4 within which is mounted a filament 6 connected at its ends to dumet leads 8 which are sealed through the envelope 4 at the lower end thereof. Each lead 8 is secured at 10 by staking, welding, clamping, or soldering to a spring connector 12. The upper ends of connectors 12 may be flexed downwardly into the dotted line positions shown in FIG. 1 to enable electrical contact with conductors on the panel on which the based lamp is to be mounted.

FIG. 2 shows a completed based lamp comprising the lamp 2 and base 18 of thermoplastic material. A portion of a printed circuit panel is indicated in dashed lines at 20. The ends of the spring contact terminals 12 are shown flexed for firm electric contact with the printed circuit panel 20. Thus, the lamp filament 6 may be connected to a source of power through the lamp leads 8, the spring contacts 12 and the printed circuit. Camming projections 56 and 56' (not shown) are approximately diametrically opposed so as to urge the lamp assembly upward into the aperture in circuit panel 20 when the lamp assembly is rotated in a predetermined direction in the aperture. Thus, the downwardly-flexed upper ends of the spring connectors 12 are pressed against the bottom surface of the circuit board 20. The mechanical stops 57 and 57' (not shown) projecting upwardly from collar portion 64 serve to limit the angle through which the lamp assembly may be rotated after insertion into the aperture in circuit board 20 by engaging the slots through which camming projections 56 and 56' must be inserted.

The base 18 on the lamp is formed by inserting the lamp 2 in a mold cavity having suitable openings and recesses to leave the upper portions of the connectors 12 uncovered and to provide the flange 64, and gripping elements 56 and 57 on the base when the cavity is filled with a flowable molding material.

A thermoplastic material such as high impact polystyrene or other thermoplastic composition such as nylon or polypropylene may be employed. The molding material is injected into the mold cavity under pressure for approximately ten seconds and is preferably heated to increase its flowability. After a very short cooling time, the mold sections are separated and the based lamp is removed.

The advantages of the present invention will be apparent to those skilled in the art, as well as changes which could be made in the foregoing embodiments without departing from the spirit and scope of the invention. Therefore, it should be understood that the present invention is not to be limited to the foregoing description of the specific embodiments thereof, but is to be determined by the spirit and scope of the invention.

I claim:

1. A rear-loading panel lamp assembly comprising:

- (1) a lamp having an envelope and leads having portions thereof protruding out of said envelope;
- (2) spring terminal connectors secured to said portions of said lamp leads; and

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(3) a base for mounting said lamp in a circuit panel, said base being permanently molded about a portion of said envelope, about said portions of said leads, and about those portions of said spring terminal connectors to which said leads are secured so as to expose a portion of each spring terminal connector adapted to electrically connect the lamp to a printed circuit panel when the lamp assembly is mounted therein.

2. The rear-loading panel lamp assembly according to claim 1 wherein said base includes camming means operative to engage a circuit panel in which said lamp assembly is to be mounted.

3. The rear-loading panel lamp assembly according to claim 1 wherein said base includes mechanical stopping means operative to limit the rotation of said lamp as-

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sembly in a circuit panel in which said lamp assembly is to be mounted.

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