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LAMP BASE FOR ELECTRIC GASEOUS DISCHARGE DEVICES

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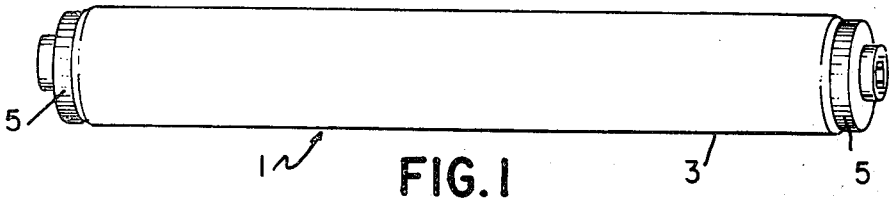

FIG. 1

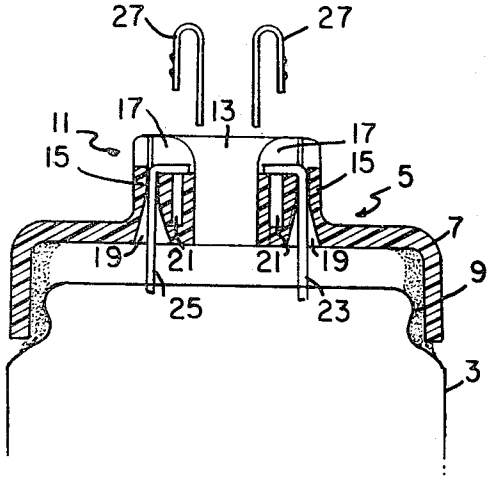

FIG. 2

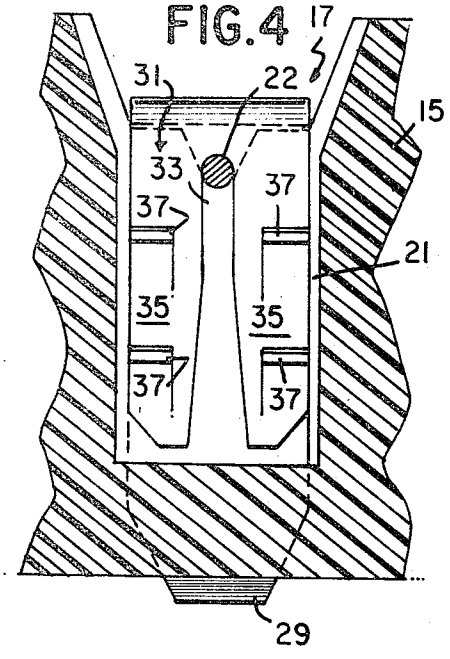

FIG. 4

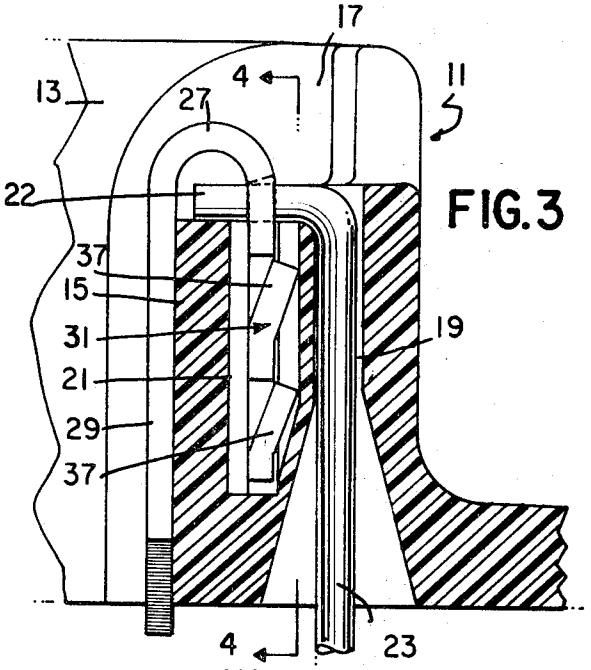

FIG. 3

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LAMP BASE FOR ELECTRIC GASEOUS DISCHARGE DEVICES

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U.S. Cl. 313—318 4 Claims

ABSTRACT OF THE DISCLOSURE

A base for a lamp having a pair of lead-in wires extending from an end thereof. The base is a one-piece, molded member of thermoplastic material having a boss within which the lamp lead-in wires are secured to barbed, bifurcated metal clips.

This invention relates to bases for electric lamps and more particularly to bases for elongated tubular lamps.

In the manufacture of electric gaseous discharge devices, such as fluorescent lamps for example, the lamp envelope is usually provided with a base at each end thereof. The bases, which serve as the supporting elements of the lamp, also constitute means through which electrical energy may be transmitted from holders in which the lamp is supported to electrodes within the lamp envelope.

In one form of fluorescent lamp construction, the base, with which each end of the lamp envelope is provided, comprises an annular metal shell, a disk of insulating material supported therein and a pair of metal pins secured to and extending from the disk of insulating material. Lead-in wires, to which a lamp electrode is connected, project from the end of the lamp envelope and terminate in the base pins. The lead-in wires are secured to the base pins by suitable means, such as by welding or soldering for example. When a lamp of this type of construction is installed, the base pins of the lamp engage electrical contact members in a lampholder, thereby establishing the means through which electrical energy may be transmitted to a lamp electrode.

In another form of fluorescent lamp construction, the base, with which each end of the lamp envelope is provided, has no base pins. In one modification of this type of construction, the base comprises an annular metal shell, a disk of insulating material supported therein, a boss formed integral with the disk and a pair of flat, relatively wide, metal strips disposed in the disk, with the metal strips serving as the electrical contact members of the base. Each lamp lead-in wire is attached, as by welding for example, to one of these metal strips at or near one end thereof. Thus when the lamp is installed, the lampholder contacts positively engage a relatively large surface area of these metal strips at a location relatively distant from the point at which the lead-in wires are attached thereto. Thus, the electrical contact surfaces of the base comprise continuous, flat, wide surfaces undamaged and uncontaminated by lamp processing operations, providing thereby the optimum possible contact conditions at all times. Although this particular modification of this type of construction represented a significant improvement over other modifications of this type employed prior thereto, there are some disadvantages.

Complete reliability of welding is difficult to attain and, in a high speed mass production operation, the number of missed welds can run high. Unfortunately, it is only after the lamp manufacturing and assembly operations have been completed that a missed weld can be detected. Usually, this type of defect is not easily corrected by reworking and the entire lamp has to be scrapped.

In view of the foregoing, the principal object of this invention is to provide an improved lamp base of the pinless type in which the advantages of some form of metal strip as a base contact is retained and the disadvantages of welding as noted above are eliminated.

This and other objects, advantages and features are obtained with a one-piece, molded base of thermoplastic material into the boss of which a pair of substantially U-shaped metal clips are driven. One leg of each of these clips is bifurcated and barbed. Each lamp lead-in wire extends through a funnel-shaped hole in the base and is securely gripped in the bifurcation. The barbed portion of the clip insures its retention in the base.

In the accompanying drawing in which a specific embodiment of the invention is illustrated, FIG. 1 is an elevational view of a fluorescent lamp provided with bases embodying this invention.

FIG. 2 is an enlarged cross sectional view of one of the bases of FIG. 1 prior to the insertion of the clips therein.

FIG. 3 is a further enlargement in section of a portion of the base of FIG. 2 with the clips inserted therein.

FIG. 4 is an enlarged view in section of a portion of the base taken along the line 4—4 of FIG. 3.

Referring now to the specific embodiment of the accompanying drawing, there is illustrated in FIG. 1 thereof, a fluorescent lamp 1 of a conventional commercial type, i.e., an elongated tubular envelope 3 provided with a coating of fluorescent material on the inner wall thereof and having a mount sealed therein at each end thereof. Each mount includes a filamentary electrode having a coating thereon of electron emissive material and a pair of lead-in wires extending from the filamentary electrode to the exterior of the hermetically sealed lamp to provide the means through which connections to a source of electrical energy are established. Each end of the lamp envelope 3 is provided with a base 5, an enlarged cross sectional view of one of these bases being illustrated in FIG. 2.

As shown in FIG. 2, the base 5 comprises a cap 7 of thermoplastic material, such as a silicate-reinforced polyamid for example, secured to the end of lamp envelope 3 by basing cement 9 and a central boss 11, substantially rectangular in contour, preferably formed integral therewith. The cap 7 and the boss 11 are provided with aligned openings defining a central aperture 13 extending therethrough. A pair of opposite side walls 15 of the substantially rectangular boss 11 are not as tall as the other pair of walls and thus slots 17 at a pair of opposite ends of the boss are defined. Each of these walls 15 is provided with a bore 19 extending therethrough and a slot 21 formed therein from the top face thereof. Each of the lead-in wires 23 and 25 extending from the end of lamp envelope 3 is threaded through the funnel-shaped entrance of its corresponding bore 19 and bent inwardly toward the central aperture 13, so that it lies within slot 17 and overlies its related slot 21. A substantially U-shaped metal clip 27 is then driven into the boss 11 to secure each of the lead-in wires thereto within the boss.

As shown particularly in FIGS. 3 and 4, each substantially U-shaped metal clip 27 is characterized by a long leg 29 and a short leg 31. As shown particularly in FIG. 3, when assembled the long leg 29 lies along the inside face of wall 15 of boss 11 within central aperture 13 and thus is accessible for engagement by a mating electrical contact member of a lampholder. As shown particularly in FIG. 4, the short leg 31 is provided with a tapered bifurcation 33, each prong 35 of which is provided with a set of barbs 37. When a clip 27 is driven into the boss 11, the short leg 31 thereof enters the slot 21 in the side wall 15 thereof with the prongs 35 astride the lateral leg 22 of the lead-in wire 23. As the short leg 31 moves further into its slot

21, the adjacent inside faces of the prongs **35** which define the tapered bifurcation **33** engage, grip and bite into the lateral leg **22** of the lead-in wire as shown in FIG. 4. When the short leg **31** is seated as shown in FIG. 3, the barbs **37** thereof are in firm frictional engagement with the wall of the slot **21** and will dig into the thermoplastic material and thus resist any force which might tend to dislodge it.

The base of this invention readily lends itself to mass production assembly techniques and provides a product structure having several advantages over the bases of this type available heretofore. The base of this invention is a thermoplastic member molded in one piece whereas heretofore these bases usually comprised an aluminum shell and an insulating member having a disc or wafer portion and a boss portion which had to be assembled. In addition, due to the difference in expansion rates of glass and aluminum, there was the tendency for ring strains to develop when the aluminum shell was cemented to the lamp base line. Due to the resilience of the thermoplastic material, no such problem arises with the base of this invention.

The lamp-base assembly operation may be performed by first feeding the lamp lead-in wires **23, 25** through the funnel-shaped entrance, into and through the bores **19**, trimming them as required and then forming them to define lateral legs **22** overlying slots **21**. An electrical continuity test may then be performed to detect the presence and proper positioning of the lead-in wires. If the electrical circuit through the lead-in wires and the filamentary electrode of the lamp tests "open," this indicates that the lead-in wires are not properly positioned and thus the metal clips **27** may be withheld and the lamp withdrawn from the line for inspection and reworking. On the other hand, such an intermediate testing at this point was not possible with the base superseded by the base of this invention and missed welds could be detected only after completion of the assembly operation.

If the electrical continuity test indicates that the lead-in wires are positioned properly, the metal clips **27** are driven into the boss **11** to secure the lead-in wires **23, 25** thereto as described above in connection with the description of FIGS. 3 and 4.

What we claim is:

1. A base for an electric lamp having a pair of lead-in wires projecting from an end thereof, said base comprising a unitary body member of thermoplastic material having a cap, a central boss and a central aperture extending therethrough; means in said unitary body member for receiving said projecting lead-in wires; and a substantially U-shaped metal clip driven into said central boss and securing therein each of said lead-in wires.

2. The combination of claim **1** in which one leg of said U-shaped metal clip is bifurcated and the lead-in wire is wedged therein.

3. The combination of claim **1** in which one leg of said substantially U-shaped metal clip lies in said central aperture to define an electrical contact and the other leg thereof is bifurcated with the lead-in wire wedged therein.

4. The combination of claim **1** in which one leg of said U-shaped metal clip is provided with a tapered bifurcation within which said lead-in wire is wedged, said tapered bifurcation defining a pair of prongs having barbs formed therein for securing said clip in said boss.

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