Nov. 20, 1956 R. B. THOMAS 2,771,589

END CAP FOR FLUORESCENT LAMP

Filed Dec. 14, 1954 2 Sheets-Sheet 1

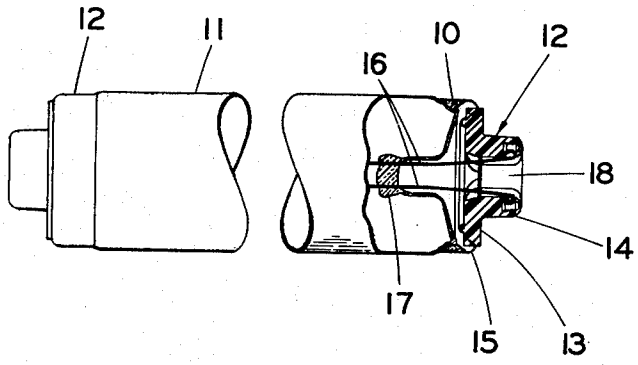


FIG. 1

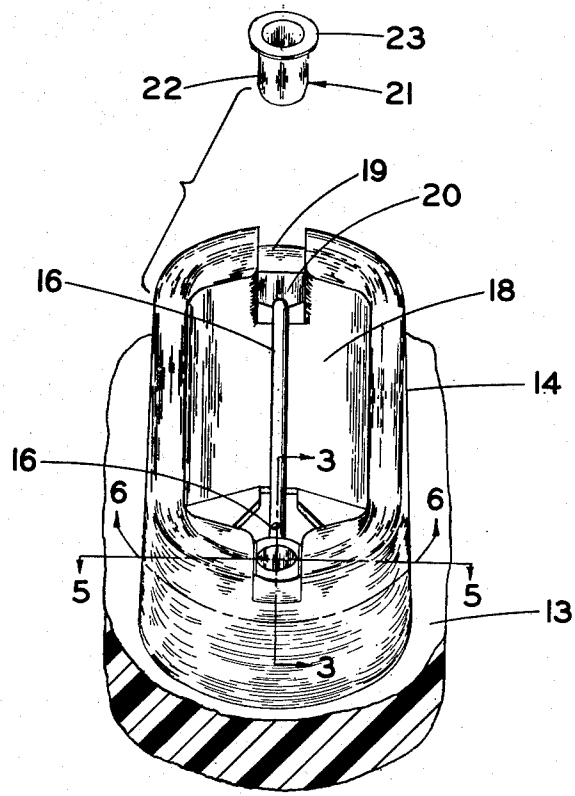


FIG. 2

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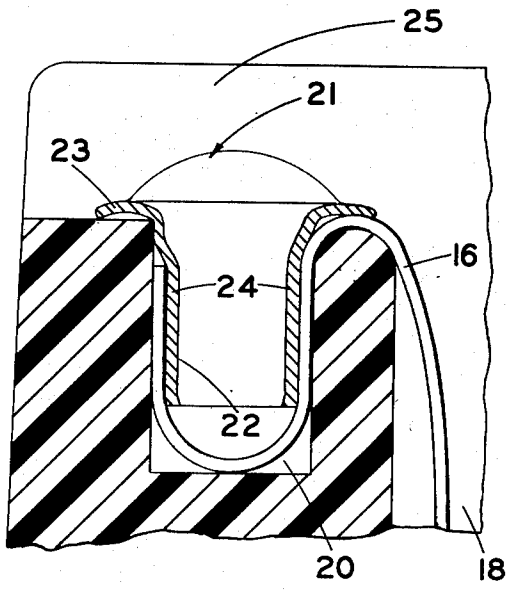


FIG. 3

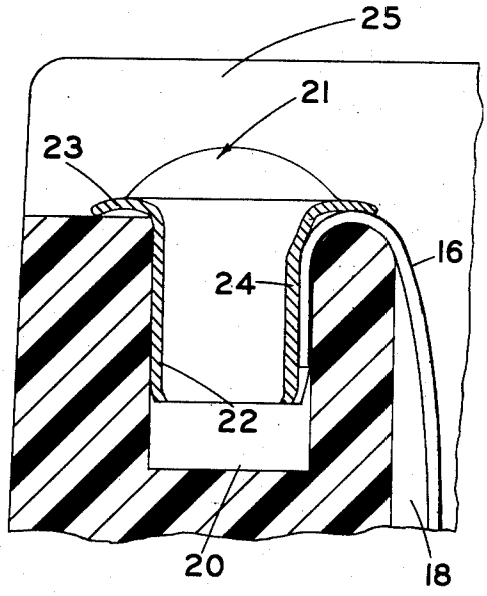


FIG. 4

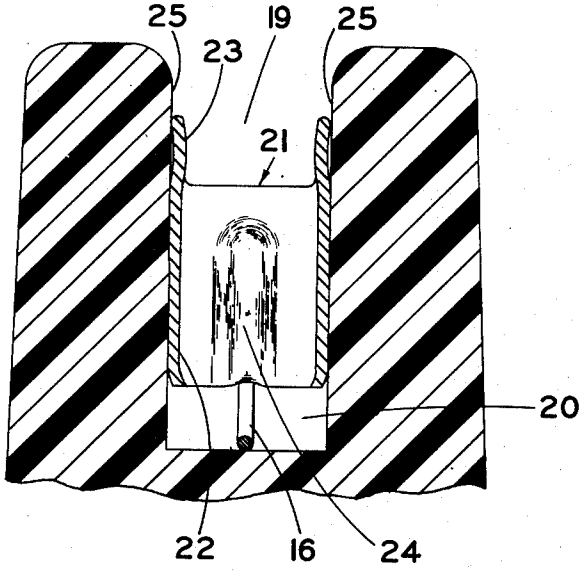


FIG. 5

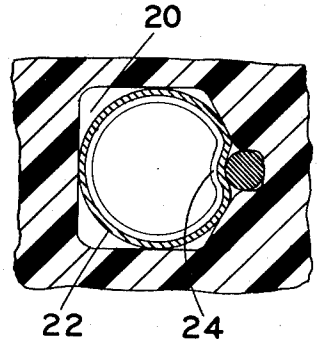


FIG. 6

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END CAP FOR FLUORESCENT LAMP

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4 Claims. (Cl. 339—144)

This invention relates to fluorescent lamps and more particularly to high voltage fluorescent lamps in the form of tubes having filament lead-in terminals supported in recessed caps at both ends of the tube.

Conventional high-voltage tubular lamps of the fluorescent type employ glass tubes or envelopes and hitherto have had filament lead-in terminals projecting outwardly from a cap at each end. These terminals are adapted to fit into conventional lamp-holders and are adequate from the point of view of electrical contact. However, a major disadvantage lies in the fact that such lamps are electrically conductive and may present a serious danger of shock if the person who installs one of them is not perfectly insulated from ground and happens to be touching the outwardly projecting terminals at one end of the tube while the terminals at the other end are in contact in the lamp holder.

It is an object of my invention to provide, in connection with caps at both ends of high voltage fluorescent tubes, a filament lead-in terminal supporting arrangement by means of which danger from electrical shock is substantially eliminated.

A further object of my invention is to provide a filament lead terminal arrangement for such tubes which will be secure against random movement of the filament leads within the cap.

A still further object of my invention is the provision of a low-resistance electrical connection between the lamp and the lamp holder into which it is installed.

In the accomplishment of these and other objects of my invention in a preferred embodiment thereof, I employ a high-voltage substantially cylindrical fluorescent tube having lead-in terminals supported in caps at both ends thereof.

Both caps have recessed portions in which the filament lead-in wires are so disposed and secured that danger of accidental contact with these lead-in wires is avoided.

It is a particular feature of my invention that the lead-in wires are firmly anchored within the caps such that random movement thereof is completely eliminated.

It is still another feature of my invention that the lead-in wires are secured within the caps in such a manner that a clean enlarged area of electrical contact is provided. The high degree of heat required in various processes prior to mounting of the caps encourages rapid surface oxidation of the lead-in wires. A contact between such a surface and lamp-holder contact elements would produce a connection of undesirably high electrical resistance in the low voltage filament heater circuit thereby impairing the useful life of the lamp if not actually rendering it inoperative. To secure the lead-in wires, my invention utilizes an eyelet which may be silver plated for better electrical contact and has a head section presenting to the lamp holder an enlarged electrical contact area. Furthermore in the process of anchoring, the eyelet abrades the lead-in wire thereby creating a low resistance connection between the eyelet and the lead-in wire.

Further objects and features of this invention will be best understood and appreciated from the following detailed description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings, in which:

Figure 1 is a view in side elevation showing one end in partial cross section of an illustrative embodiment of this invention.

Figure 2 is an enlarged view of perspective of the boss on a cap showing one eyelet in place and one eyelet exploded for clarity.

Figure 3 is an enlarged view in cross section taken along the line 3—3 of Figure 2.

Figure 4 is an enlarged view in cross section taken along the line 3—3 Figure 2 showing an alternative method of anchoring the lead wire.

Figure 5 is an enlarged view in cross section taken along the line 5—5 Figure 2.

Figure 6 is an enlarged view in cross section taken along the line 6—6 Figure 2.

Figure 1 presents a general view of a tubular fluorescent lamp incorporating the invention. On each end of a glass envelope **11** is mounted an end cap **12** bonded to the glass by means of a quantity of cement **10**. The cap **12** in this preferred embodiment consists of a base **13**, an upstanding boss **14** molded integral with the base **13** of phenolformaldehyde or similar material and a depending metal skirt **15** molded into the base **13**. Lead-in wires **16** project from a glass stem press **17** of the envelope **11** upwardly or outwardly, as shown in Figure 2, through an open passage **18** in the boss **14**, then turn in opposite lateral directions to enter slot **19** where they terminate in pockets **20**.

An eyelet **21**, or cylindrical plug, having a body portion **22** and a head **23** is inserted into the pocket **20** in contact with the lead-in wire **16**. The eyelet **21** is of such size that it is deformed in the area **24**, as shown in Figs. 5 and 6, by the lead-in wire **16** which is thereby held under compression or frictional engagement. The head **23** of eyelet **21** is of a diameter greater than the width of the slot **19** so that in the process of insertion the head **23** is bent upwardly to form a ratchet-like engagement, which will dig into the side walls **25** as shown in Figure 5 to resist outward axial movement.

The lead-in wires **16** may be inserted into pockets **20** in several ways. One such method is to form a loop in the end of lead wire **16** which is disposed downwardly or inwardly adjacent to inner walls of pocket **20**, then upwardly or outwardly adjacent to an outer wall of the said pocket thereby contacting the periphery of eyelet **21** in two places as shown in Figure 3. On the other hand, a method which is preferred because it facilitates insertion of eyelet **21** is to provide a shorter length to lead-wire **16** which is disposed adjacent only to the inner walls of pocket **20** at least part of the way down as shown in Figure 4.

Numerous minor variations of the preferred embodiment of my invention will now be apparent to those skilled in the art. For example the lamp of the preferred embodiment need not be straight but may as well be formed in various contours. Again the upstanding boss **14** need not be molded integral with the base **13**, and on the other hand skirt **15** need not be metallic but may be of phenol-formaldehyde or similar material integrally molded to base **13** so long as the female terminal elements of my invention are employed. Other modifications will be apparent and therefore it is not intended to confine the invention to the precise form herein shown but rather to limit it in terms of the appended claims.

What I claim is:

1. In combination with a high voltage tubular fluorescent lamp having a glass envelope and filament lead-

in wires projecting from one end thereof, a cap mounted on the end of said glass envelope around said lead-in wires comprising a base, an upstanding elongated boss integral with said base, said boss having an upper end wall, internal walls defining an open passage from the outside through said boss and said base to said envelope, the upper end wall of said boss being indented to form a longitudinal slot therein, a pocket in said slot on each side of said passage, said lead-in-wires extending upwardly through said passage and laterally adjacent to the bottom wall of said slot, one of said lead-in wires terminating in each of said pockets, and an eyelet in frictional engagement with each of said lead-in wires and the walls of one of said pockets.

2. The cap defined in claim 1 further characterized by the eyelet having a head section in ratchet-like engagement with the side walls of said slot whereby said eyelet is retained in said pocket against axial movement.

3. A cap assembly adapted to being mounted on an end of a tubular fluorescent lamp having a glass envelope and filament lead-in wires projecting therefrom comprising a base, an upstanding elongated boss integral with said base, said boss having an upper end wall, internal walls defining an open passage from the outside through said boss and said base to said envelope, the upper end wall of said boss being indented to form a longitudinal slot therein, a pocket in the bottom wall of said slot on each side of said passage, said passage providing an upward path and said slot a recessed lateral path to a point of termination in said pockets for said lead-in wires, and an eyelet in frictional engagement with each of said lead-in wires and the walls of one of said pockets.

4. The cap assembly defined in claim 3 further characterized by the eyelet having a head section in ratchet-like engagement with the side walls of said slot whereby said eyelet is retained in said pocket against axial movement.

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