

- [54] **COUPLING FOR SECURING A LAMP
IN A LAMPHOLDER**

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- [51] **Int. Cl.** **H01r 33/08**

- [58] **Field of Search**339/50-54, 75 R,
339/75 T, 65, 66, 120, 124, 176 L, 191, 200;
240/51.11, 51.11 A

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[57] **ABSTRACT**

A coupling adaptable to or integral with a lampholder and cooperable with the base of a lamp to prevent relative axial movement of the lamp with respect to the lampholder into which it is inserted.

5 Claims, 9 Drawing Figures

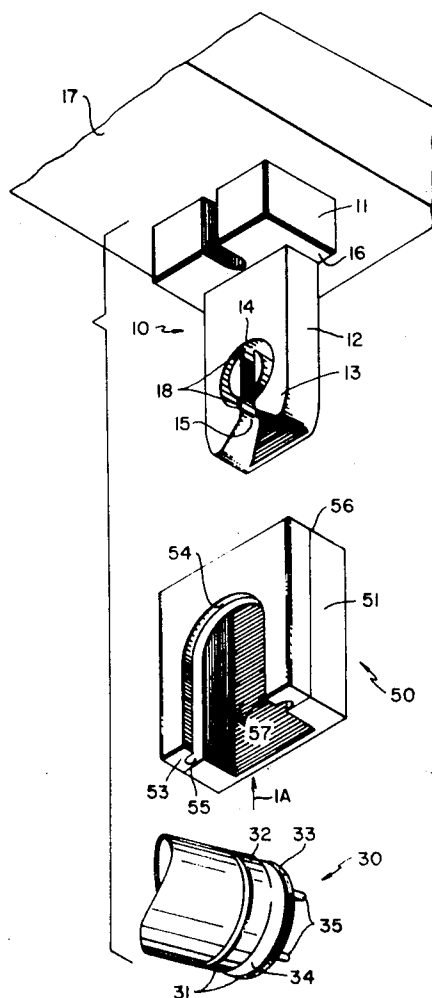


FIG. 1B

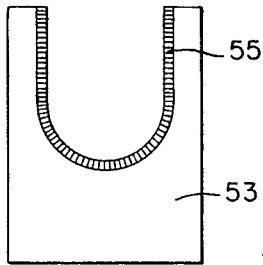


FIG. 2

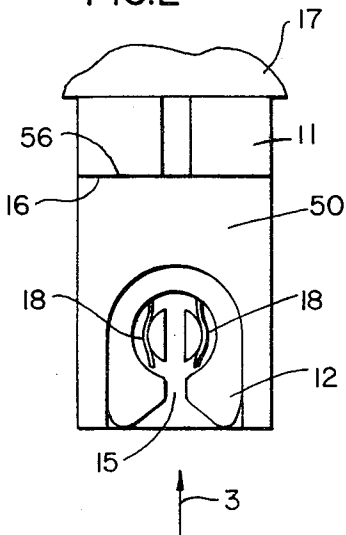


FIG. 3

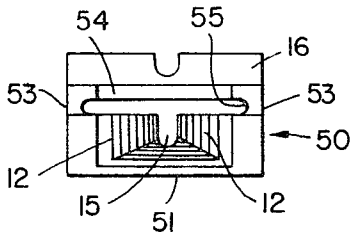
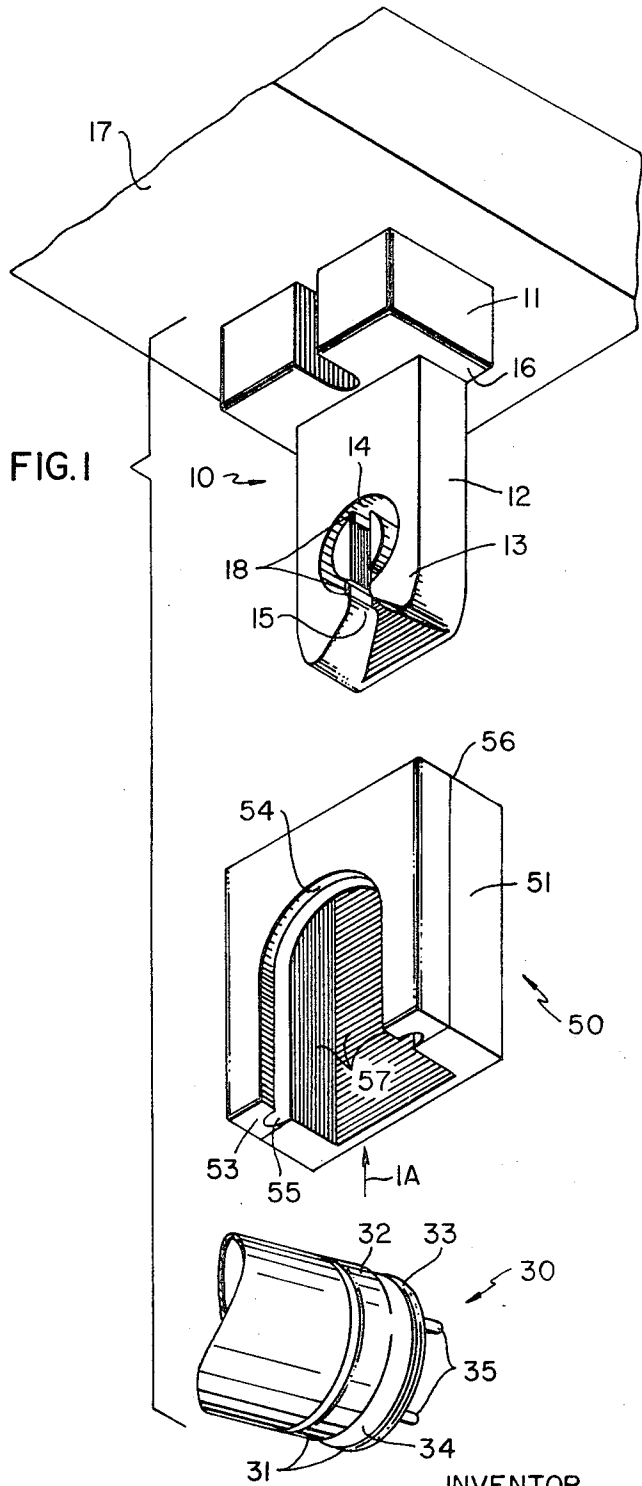
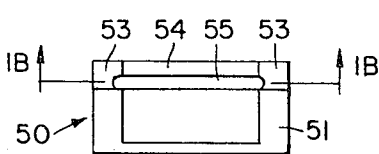


FIG. 1A



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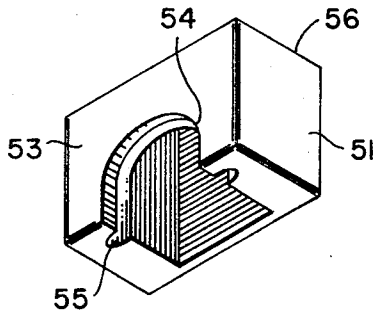


FIG. 4

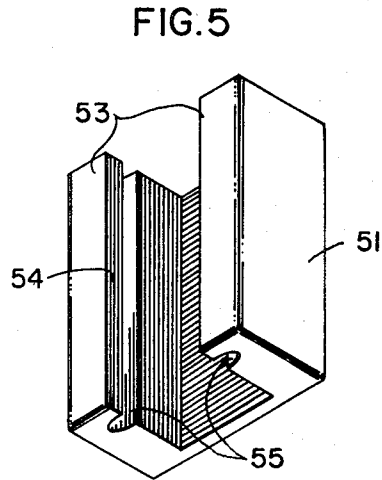


FIG. 5

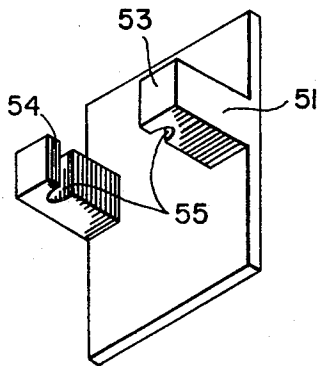


FIG. 6

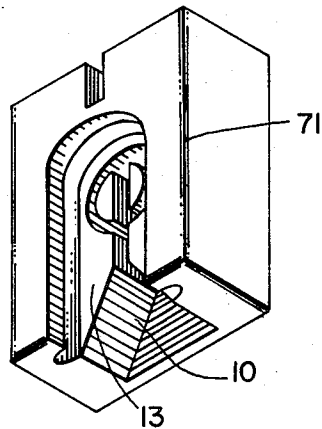


FIG. 7

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COUPLING FOR SECURING A LAMP IN A LAMPHOLDER

BACKGROUND OF INVENTION

This invention relates generally to couplings for securing lamps in lampholders and more particularly to a coupling adaptable to or integral with a lampholder for a tubular, fluorescent lamp.

Historically, inability to initiate or maintain firm electrical contact between tubular lamp terminal pins and the contacts of the lampholder into which they are inserted has been a continuing problem resulting in failure in lamp starting, slow lamp starting, lamp flickering in operation, decreased lamp life, decreased ballast life and lamp discoloration. Furthermore, in extreme cases, the length and weight of the lamp causes complete release by the lampholder and a consequent safety hazard.

Frequently, the failure to maintain firm contact is directly a result of the lack of adequate coupling between the lamp and lampholder to prevent relative axial motion of the lamp base with respect to the lampholder. In many cases it is indirectly a result of gradual increase in the distance between lampholders which will cause this relative axial motion.

Prior attempts at a solution to the problem have introduced additional steps in the installation and removal of lamps or have incorporated movable parts. They have employed such devices as flexible wire clips attachable to the lampholder and releasable for lamp installation or removal, rotating collars or removable plates to grip the lamp and hinged lampholders spring biased to hold a lamp between them.

It is, therefore, an object of this coupling to secure the electrical connection between a lamp and its lampholder.

A further object of this coupling is to prevent relative axial motion of a lamp with respect to its lampholder.

Another object of this coupling is to utilize the lamp as a tie-rod between lampholders in which the lamp is connected, thereby preventing spreading of the lampholders. A still further object of this coupling is to allow changing or replacement of lamps without removal or adjustment of the coupling.

It is yet another object of this coupling to be adaptable to modern lampholders.

SUMMARY OF THE INVENTION

In accordance with these objects, a coupling is provided which will hold a lamp having a peripherally corrugated tubular end to a lampholder having an access into which the lamp is transversely inserted. The coupling comprises a yoke and means for securing the yoke to the lampholder in such a position that the open end of the yoke is aligned with the lampholder access so that when a lamp is inserted in the yoke, it may be electrically connected to the lampholder. The inner surface of the yoke has a corrugation complementary to and engageable with the corrugation of the lamp, the two corrugated surfaces cooperating with each other to hold the lamp and lampholder against relative axial movement.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the invention will become apparent upon reading the following detailed description with reference to the drawings, in which:

FIG. 1 is an exploded perspective view of a modern twist-turn lampholder, including a modified tubular fluorescent lamp, and the preferred embodiment of the coupling. FIG. 1A is a top view in the direction of line 1A-1A in FIG. 1. FIG. 1B is a sectional view taken along line 1B-1B in FIG. 1A.

FIG. 2 is an elevation view illustrating the coupling mounted on the lampholder.

FIG. 3 is a top view in the direction of line 3-3 in FIG. 2.

FIG. 4 is a perspective view of one modification of the coupling.

FIG. 5 is a perspective view of another modification of the coupling.

FIG. 6 is a perspective view of another modification of the coupling.

FIG. 7 is a perspective view of an integral coupling and lampholder.

While the invention will be described in connection with a preferred embodiment, it will be understood that it is not intended to limit the invention to that embodiment. On the contrary, it is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION

A modern lampholder 10 of the twist-turn type for use with a tubular, bi-pin, fluorescent lamp 30 is illustrated in FIG. 1. The lampholder 10 comprises a mounting portion 11 suitable for fixing the lampholder to a desired surface 17 and a socket portion 12 integrally extending from the mounting portion 11. One surface of the socket portion 12, designated as the lamp mounting face 13, contains a circular slot 14. This slot contains the electrical contacts 18, shown in FIG. 2, which receive and engage the lamp terminal pins 35. Insertion of the lamp terminal pins in the slot 14 is facilitated by access 15 which is a straight slot extending from the circular slot 14 to the outer extremity of the lamp mounting face 13. This access 15 permits insertion of the lamp in the socket in a direction transverse to the radial axes of the slot 14 and the lamp.

Also illustrated in FIG. 1 is a modern, tubular, fluorescent lamp 30 of the bi-pin, twist-turn type for use with the lampholder 10 described above. The fluorescent lamp 30 has a modified lamp base 31, comprising the tubular plug 32 from which integrally extends the annular member 33. The radius of the portion between the plug 32 and the member 33 is less than the radii of the plug 32 and the member 33, resulting in a circumferential groove or peripheral corrugation 34 about the lamp base 31. One or more lamp terminal pins 35 extend from the annular member 33 in a direction parallel with the radial axis of the tubular lamp base 31.

Illustrated between the lampholder 10 and the lamp 30 is a coupling 50 for use in securing the lamp 30 and lampholder 10 in electrical connection with each other.

The coupling 50 has a detachably retainable body or tubular member 51. The inner peripheral surface 57 of the tubular member 51 is substantially equal to the outer peripheral surface of the socket portion 12 of the lampholder 10. Thus, the body or tubular member 51 is a housing which, when inserted over the socket portion 12 of the lampholder 10, makes, and is held in position by, frictional contact with the lampholder 10. It may be noted that to further insure adequate frictional contact any one or more of the inner peripheral surfaces 57 of the member 51 or outer peripheral surfaces of the socket portion 12 may be inwardly or outwardly biased respectively.

When the coupling is in its mounted position, one wall of the tubular member 51 is adjacent to the lamp mounting face 13 of the lampholder 10. This wall is designated as the lamp access wall or open broadside and, comprises a clamp member or receptacle 53 which may be attached to or integral with the member 51. In the Figures this member is shown as attached to the member 51, which then functions basically as a bracket, for the sake of simplicity in description of the parts of the device. In the preferred embodiment, however, integral construction is desirable. This clamp member 53 has a U-shaped indentation or slot 54. The thickness of the wall is such as to permit a groove or corrugation 55 to be channelled along the interior surface of the U-shaped indentation 54. The dimensions of the groove 55 are such as to compliment the dimensions of the annular member 33 on the lamp 30 so that when the annular member 33 is transversely, slideably inserted in the receptacle groove 55, movement of the lamp 30 in a direction along the lamp axis is prohibited. The location of the groove 55 in the indentation 54 is such that, when the coupling 50 is positioned on the lampholder 10 and the annular member 33 is inserted in the groove 55, the lamp terminal pins 35 will be fixed in an electrically operable depth relation with respect to the electrical contacts of socket portion 12. Thus the grooved receptacle may also be envisioned as a corrugated yoke which secures the lamp in electrical contact with its holder and against axial motion away from the holder.

It may be desirable in some instances to utilize a multiplicity of annular members 33 and a corresponding multiplicity of grooves 55 in the indentation 54. This would, of course, require an increase in the thickness of the wall.

In the preferred embodiment of the coupling as illustrated in FIG. 1, optimum contact of the clamp member or grooved receptacle 53 to the lamp is desired. To this end, the U-shaped indentation 54 has a semi-circular base. The groove 55 extends along the entire interior surface of the indentation 54, as is best seen in FIGS. 1A and 1B. The axially varying radii of the grooved indentation 54 is substantially equal to the correspondingly axially varying radii of the grooved or corrugated portion of the lamp base 31. The radial axis of the semi-circular base of the indentation 54 is located in the wall so that it coincides with the radial axis of the lamp 30 and the circular slot 14 when the lampholder 10, lamp 30 and coupling 50 are in the electrically operable position. In this configuration, maximum cooperation between the receptacle 53 and lamp base 31 is obtained, providing maximum stability.

The operation of the coupling may be best understood by referring to FIG. 1. While only a single lampholder 10 is shown, it is obvious that for a single tubular fluorescent lamp 30 a pair of lampholders fixedly mounted at an appropriate interval is required. A coupling 50 is slideably mounted and frictionally held on the socket portion 12 of each lampholder 10 with the top surface 56 of the coupling 50 abutting the bottom surface 16 of the lampholder mounting portion 11. The coupling 50 is shown in its mounted positions in FIGS. 2 and 3. Once so mounted the coupling 50 will move only in a direction away from the bottom surface 16 and only upon exertion of a force in that direction. However, since the open end of the yoke is at the lampholder access 15, changing or replacement of lamps may be accomplished without removal or adjustment of the coupling 50. Returning to FIG. 1, the lamp 30 is mounted by slideably inserting the annular members 33 in their respective coupling grooves 55 and the lamp terminal pins 35 into access slot 15. The pins 35 are then engaged with the socket contacts in the usual twist-turn manner. This lamp-lampholder engagement restrains the lamp 30 against any motion in directions extending radially from the axis of the lamp 30. Each coupling 50 acts independently as a link, restraining the lamp 30 against any motion with respect to its lampholder 10 in a direction along the axis of the lamp 30. This insures lamp-lampholder engagement and once in the electrically operable position the lampholder 10, lamp 30 and coupling 50 are stable with respect to relative movement in any direction except for rotational movement of the lamp about its own axis. Furthermore, the pair of couplings 50 interact to utilize the lamp 30 as a tie-rod between lampholders 10, thereby preventing any change in the distance between lampholders. Thus, the couplings 50 rigidly retain the lamp 30 and lampholders 10 in the electrically operable condition until lamp changing is desired. Lamp changing is accomplished by disengaging the lamp 30 from the lampholders 10 in the usual twist-turn manner and then slideably removing the lamp 30 from the coupling 50. The coupling 50 remains in position on the lampholder 10 and a new lamp may be inserted.

It should be noted that while in the preferred embodiment of the coupling 50 a semi-circular based, U-shaped, grooved receptacle 53 is used, the desired prohibition of lamp movement in a direction along its axis may be achieved by any number of modifications in this receptacle, three of which are exemplified in FIGS. 4, 5 and 6. Each of these modifications comprises the coupling 50 shown in FIG. 1 with a portion or portions of this preferred coupling embodiment being removed.

Additionally, it will be apparent to one skilled in the art that the coupling 50 could be formed as an integral part of the lampholder 30. Such an integral combination of the lampholder and the coupling of FIG. 1 is illustrated in FIG. 7. The basic structure of the modern lampholder 10 is retained, and a U-shaped projection 71 integrally extends from the lamp mounting face 13 of the lampholder. This projection 71 is in all respects similar to the receptacle 53 of FIG. 1. Of course, the modifications of the coupling, as illustrated in FIGS. 4, 5 and 6, are equally applicable in the integral construction shown in FIG. 7.

Furthermore, while the coupling 50 has been described in connection with a twist-turn lampholder 10 and a tubular, bi-pin, fluorescent lamp, one skilled in the art will appreciate that the coupling 50 is not necessarily so limited. Any lamp type of any configuration having lamp base modified as described herein may be employed with any compatible lampholder having a laterally accessible, contact containing slot.

Thus, it is apparent that there has been provided, in accordance with the invention, a coupling that fully 10 complies with the objects, aims, and advantages set forth above. While the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art in 15 light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications, and variations as fall within the spirit and broad scope of the appended claims.

What is claimed is:

1. A coupling for holding a lamp having a peripherally corrugated tubular end to a lampholder having an access into which a lamp is transversely inserted, said coupling comprising:

a yoke,

a bracket means integrally extending from said yoke for securing said yoke to the lampholder with the open end of said yoke aligned with the access permitting a lamp transversely inserted in the yoke to be electrically connected with the lampholder, and 30

a corrugation on the inner surface of said yoke complementary to and engageable with the corrugation of the lamp inserted transversely therein for holding the lamp and lampholder from relative axial 35

movement.

2. The coupling according to claim 1 wherein said corrugated yoke has an inner surface of semi-circular base, the axially varying radii of which are substantially equal to their respective axially varying radii on the 5 corrugated portion of the lamp, and the axis of which coincides with the axis of the corrugated portion of the lamp when the lamp is electrically connected to the lampholder.

3. The coupling according to claim 2 wherein said yoke is integral with said lampholder.

4. The coupling according to claim 1 wherein a surface of said bracket means is resiliently inwardly biased.

5. The combination comprising:

a tubular lamp having a circumferential annular member and at least one terminal pin at either end, a lampholder having a laterally accessible circular slot in a lamp mounting surface thereof containing contacts engageable with said terminal pin of the lamp,

a semi-circular clamp integral with and extending away from said lamp mounting surface, the open end of said clamp being aligned with the lateral access to the slot and the radial center of said clamp being on a common axis with the radial center of said circular slot, and

a groove about the inner surface of said clamp for engagement with the circumferential annular member of said lamp when said lamp is inserted transversely in said lampholder, said groove and said annular member cooperating to hold the lamp and the lampholder from relative axial movement.

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