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Groezinger

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[54] LAMP REMOVAL ARRANGEMENT

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[51] Int. Cl. F21v 17/00, H01r 13/62

[58] Field of Search 240/52 R, 52.1, 151, 240/152, 153; 339/4 JT

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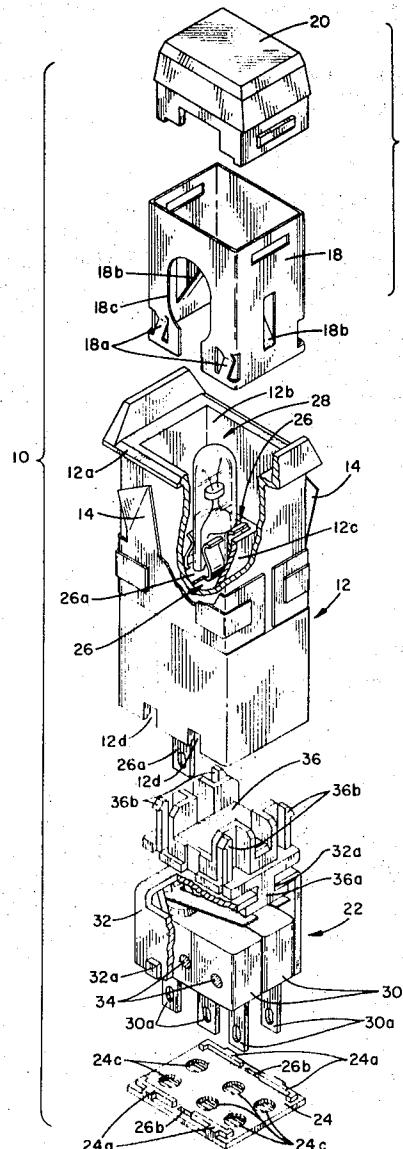
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[57] ABSTRACT

A lamp removal arrangement for a panel mounted illuminated device having a tubular housing in which a wedge base lamp is supported and further having a light transmitting closure which includes resilient fingers that pass over the tubular position of the lamp during assembly of the closure to the housing and that rigidly engage the portion of the lamp located between the tubular portion and the base portion upon removal of the closure from the housing so as to thereby cause the lamp to be removed therewith.

6 Claims, 4 Drawing Figures

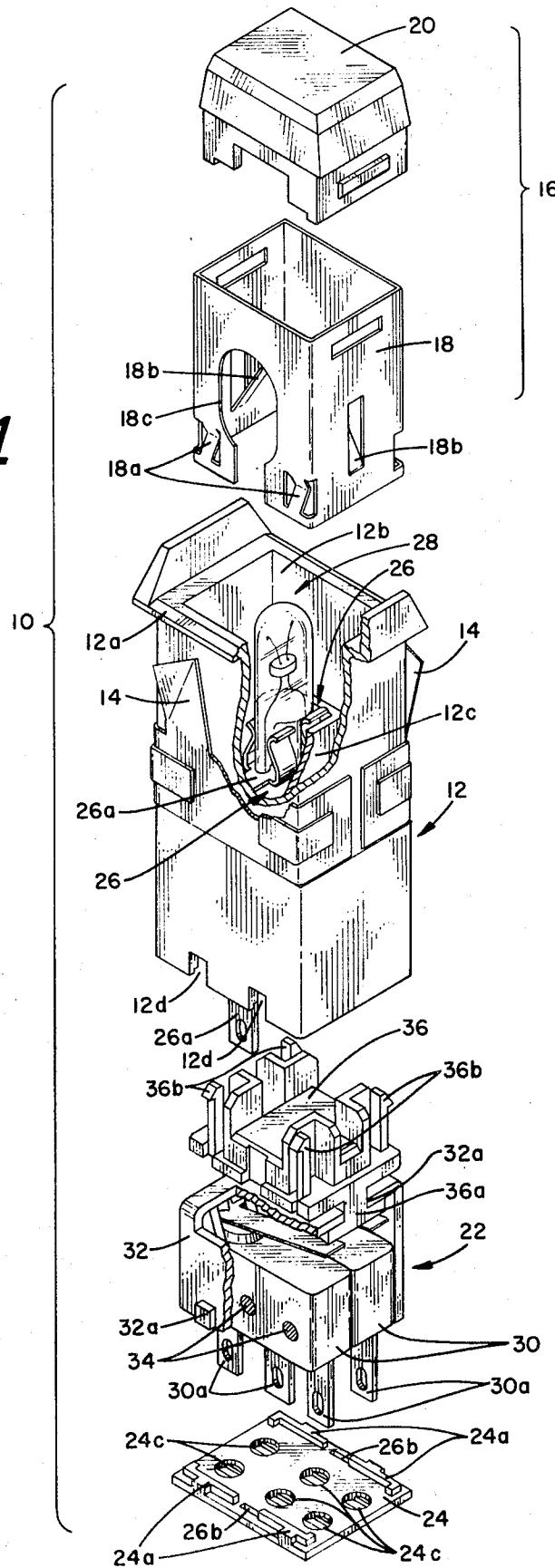


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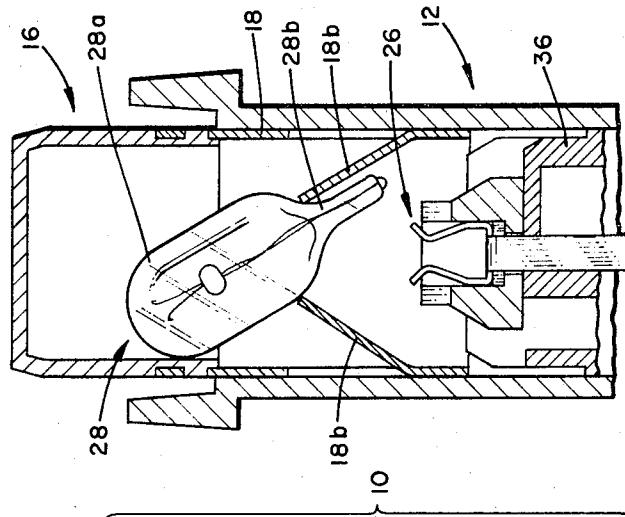
FIG-1



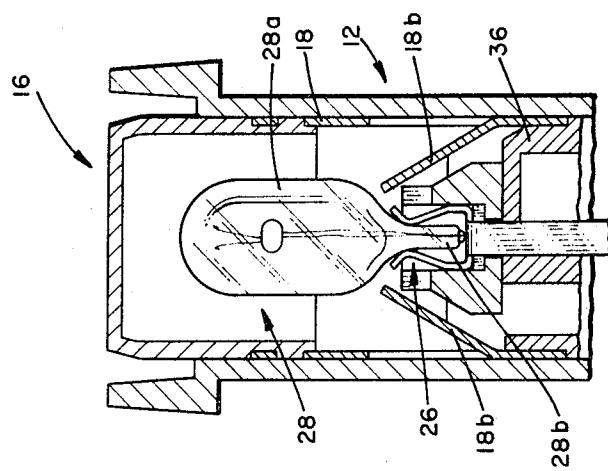
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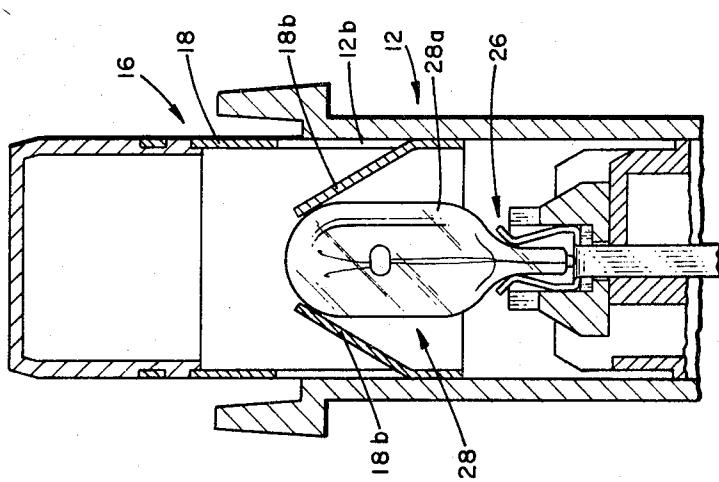
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71G-3



71G-2

LAMP REMOVAL ARRANGEMENT

This invention is directed to a lamp removal arrangement for a panel mounted illuminated device of the type utilizing a wedge base lamp where the lamp is manually located in place as a discrete element in a housing and where the lamp is removed therefrom by the interaction with and the removal of a light transmitting closure from its normal association with the housing.

In illuminated devices, such as panel mounted indicators and pushbutton switches, lamp servicing is an ongoing function throughout the life of these devices. In some such devices, the lamp is carried by the light transmitting means. Where the device is a pushbutton switch, such as disclosed in the Harrington et. al. U.S. Pat. No. 2,816,995, the light transmitting means is the pushbutton. Thus, the lamp is movable with the pushbutton and the forces of actuation and deactuation that are expended on the pushbutton are transmitted to the lamp which can reduce lamp life due to filament damage caused by such forces. To bypass this problem, lamps can be associated with a stationary portion of the housing of such devices as in the Campe et al. U.S. Pat. No. 2,935,653. However, in such devices, tools of the type disclosed in the Whipple U.S. Pat. No. 728,060 are required to remove the lamps due to the relative large depth and relative small size of the lamp supporting cavity and the inability of manual working in such a limited space. In other such devices, a separate support for the lamps is normally secured in place within the housing but removable with the pushbutton as is the case with the disclosure of the Spring U.S. Pat. No. 2,904,662.

My invention does not give rise to filament damage of the lamp as the lamp is associated with a stationary portion of the housing and does not require any tool for removal of the lamp nor a lamp support secured within the housing but removable with the light transmitting closure. Thus, as disclosed in the preferred embodiment herein, which is in the form of a panel mounted illuminated pushbutton switch, the lamp is associated with a stationary portion of the housing and can be manually located in place. The pushbutton is arranged to be inserted into the housing and detentably secured in place during which assembly a pair of fingers associated with the pushbutton ride over the tubular portion of the lamp. When servicing of the lamp is necessary, removal of the pushbutton causes the fingers to engage a connecting portion of the lamp which is disposed between the tubular portion and the base portion resulting in the lamp being removed from the stationary portion of the housing and carried out of the housing along with the pushbutton.

Therefore, it is an object of my invention to provide a panel mounted illuminated device wherein a lamp can be manually inserted into and associated with a stationary portion of a housing, wherein portions of a light transmitting closure pass over the lamp during assembly of the closure to the housing, and wherein the lamp is removable with the closure and due to the interaction between the lamp and the portions, all of which takes place without the utilization of any tools.

This and other objects will become apparent from a reading of the following specification and appended claims in which:

FIG. 1 is a perspective explosion view of a panel mounted illuminated pushbutton switch incorporating the invention;

FIG. 2 is a partial cross-sectional view of the pushbutton switch with the lamp in place and the pushbutton in position for assembly into the housing;

FIG. 3 is a partial cross-sectional view of the pushbutton switch with the pushbutton assembled in place; and

FIG. 4 is a cross-sectional view of the pushbutton switch showing the pushbutton and lamp in the process of being disassembled from the housing with the lamp being carried by the pushbutton.

In FIG. 1, a panel mounted illuminated pushbutton switch 10 includes: a tubular housing 12, open at both extremities, which is arranged to be mounted in a conventional manner to a panel by means of a bezel 12a formed in the housing and discrete mounting clips 14 which are snap fastened to the housing; a closure in the form of a pushbutton 16 comprised of a tubular sleeve 18 and a light transmitting screen 20 which are arranged to be snap fastened together in a conventional manner; a switch mechanism 22; and a fastener 24.

Within cavity 12b of the housing 12, a centrally located stationary portion 12c is located in which a pair of lamp sockets 26 are disposed. Terminations 26a of the sockets 26 extend downwardly and out of the bottom of the housing 12. Lamp 28 which is of the wedge base type is shown in the sockets 26 and can be manually inserted in place along an axis co-extensive with the longitudinal axis of the housing 12.

The switch mechanism 22 includes a pair of lever operated snap switches 30 which may be of the type disclosed in the Hadley U.S. Pat. No. 3,336,458. The switches are located in a U-shaped switch support 32 by rivets 34. Associated with the switches 30 and switch support 32 is a platform 36 which is biased upwardly by resilient means, not shown, disposed between the support and the platform. A T-shaped protrusion 36a is integrally formed with the platform 36 and depends therefrom with the upright portion passing through an opening 32a in the support 32 and the cross portion overlying the actuating levers of the switches 30.

The switch mechanism 22 is arranged to be disposed within the lower portion of the housing 12 and located in place due to the interaction of lugs 32a of the switch support 32 and cutouts 12d of the housing.

The fastener 24 is arranged to be snapped into place in the lower portion of the housing 12 by the interaction of the protrusions 24a of the fastener and protrusions, not shown, provided within the housing so as to maintain the switch mechanism 22 in place. In assembly, terminals 26a of the sockets 26 and terminals 30a of the switches 30 pass through the appropriate openings 24b and 24c of the fastener 24.

The pushbutton 16 is arranged to be disposed in the cavity 12b of the housing 12 and associated with the platform 36 by a detentable securing therebetween provided by the interaction of inwardly extending deformations 18a located in the sleeve and upwardly extending hooked resilient fingers 36b integrally formed with the platform.

The association between the pushbutton 16 and the platform 36 just described allows for actuation of the switches 30 upon inward movement of the pushbutton and hence the platform against the bias of the resilient

means, not shown, disposed between the platform and the switch support 32.

The sleeve 18 which can be formed of sheet metal includes a pair of resilient fingers 18b which are struck from oppositely disposed side walls of the sleeve and which extend toward each other and the longitudinal axis of the sleeve. The sleeve 18 further includes an opening 18c in a side wall adjacent the side walls from which the resilient fingers 18b are formed. The function of the resilient fingers 18b and the opening 18c will 10 become apparent when considered with respect to the lamp removal aspect which will now be described.

In FIG. 2, the pushbutton 16 is shown partially inserted into the cavity 12b of the housing 12 with the resilient fingers 18b of the sleeve 18 resting on the top of 15 tubular portion 28a of the lamp 28 which is already in place in the sockets 26 as was the case in FIG. 1.

In FIG. 3, the pushbutton 16 is shown assembled to the platform 36 by means of the detentable securing therebetween referred to above. In moving from the 20 position shown in FIG. 2 to that shown in FIG. 3, the resilient fingers 18b were initially moved outwardly against the inherent bias thereof so as to pass over and straddle the tubular portion 28a of the lamp 28 whereupon the bias resulted in the resilient fingers to again 25 assume the normal position as shown in FIG. 3. The illuminated pushbutton switch 10, as shown in FIG. 4, is ready for use and inward movement of the pushbutton 16 results in a direct drive being effected with the platform 36 and brings about actuation as above described. 30

To remove and service the lamp 28, the pushbutton 16, referring now to FIGS. 3 and 4, is moved outwardly so as to upset the detentable securing between the sleeve 18 and the platform 36. Upon this occurring, the resilient fingers 18b rigidly engage the connecting portion between the tubular portion 28a and base portion 28b causing the lamp 28 to be removed from the sockets 26 along an axis co-extensive with the longitudinal axis of the housing 12. The lamp 28 is loosely retained by and remains as a prisoner in the pushbutton 16 during removal of the pushbutton from the housing 12 due to the positioning of the resilient fingers 18b and the side walls of the sleeve 18 although the properly proportioned opening 18c in the sleeve 18, referred to with respect to FIG. 1, allows for the lamp to be expelled by 45 gravity by properly positioning the opening 18c and gently shaking the pushbutton 16.

To reassemble the elements after lamp servicing merely involves manually inserting a lamp 28 into the sockets 26 and reinserting the pushbutton 16 into the cavity 12b of the housing 12 as shown in FIG. 2 and repeating the cycle described in connection therewith and with respect to FIG. 3.

Other forms of my invention are possible. Therefore, the scope of my invention should be determined from 55 the following claims.

I claim:

1. A lamp removal arrangement for a panel mounted illuminated device comprising:
 - a. a tubular housing having a cavity terminating as an opening at one extremity;
 - b. a detentably secured, selectively removable closure including a light transmitting means arranged to cover said opening; and
 - c. socket means for a wedge base lamp supported within the cavity of said housing and located so that insertion and removal of said lamp take place along an axis co-extensive with the longitudinal axis of said housing;
 - d. said closure including oppositely disposed side members depending from said light transmitting means which are arranged to straddle said lamp when both are in place in said housing;
 - e. at least one of said side members having a resilient element arranged to be displaced from its normal position and against its inherent bias by and to completely pass over the tubular portion of said lamp upon forward movement and assembly of said closure into said housing;
 - f. said resilient element thereupon moving toward its normal position and rigidly engaging the connecting portion located between the tubular portion and the base portion of said lamp upon outward movement and selective removal of said closure from said housing, such removal and engagement and the resulting engagement between said lamp and the other of said side members causing said lamp to be removed from said socket means.
2. The arrangement of claim 1 wherein each of said side members includes a resilient element which completely passes over the tubular portion of said lamp during assembly and rigidly engages the connecting portion of said lamp upon removal of said closure from said housing.
3. The arrangement of claim 2 wherein said resilient elements are in the form of fingers extending toward each other and the longitudinal axis of said closure and further extending toward said light transmitting means.
4. The arrangement of claim 3 wherein said resilient fingers are integrally formed and struck from said side member.
5. The arrangement of claim 4 wherein said closure member is substantially tubular in form with an opening opposite said viewing surface and wherein said lamp can be loosely retained therein by the walls thereof and said resilient fingers upon removal of said closure and said lamp from said housing.
6. The arrangement of claim 5 wherein an opening is provided in a side wall of said closure of such a size as to allow passage of said lamp therethrough upon removal of said closure and said lamp from said housing.

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