ABSTRACT OF THE DISCLOSURE

A tubular member has opposite open ends. Two electrically conductive first terminals extend into the tubular member from one towards the other of the ends thereof and overlie the inner circumferential surface of the tubular member. A socket member carrying a bulb provided with two electrically conductive second terminals comprises a portion which is receivable in the aforementioned other open end of the tubular member. This portion has an outer circumferential surface and the second terminals overlie this outer circumferential surface and are so arranged that, when the aforementioned portion is received in this other open end of the tubular member, the second terminals are each wedged into current-conducting engagement with one of the first terminals.

BACKGROUND OF THE INVENTION

The present invention relates generally to lighting assemblies and more particularly to a novel lighting assembly which is of particular advantage in conjunction with small electric bulbs.

Problems are encountered in the manufacture and use of lighting assemblies for such small electric bulbs as are used, for instance, in Christmas-tree decorating lights, and for similar applications. On the one hand, the selling price of such lighting assemblies must be low, which can be accomplished only by drastic reduction in the technical expenditures and the labor involved. On the other hand, the completed assembly must be rather small because the type of bulbs with which it is to be used is small, and is frequently in fact of the miniaturized variety.

Furthermore, there is the problem of making replacement of the bulb simple, so that this can be carried out by persons who have neither mechanical nor electrical skills and who do not possess any tools which could facilitate this operation.

It is accordingly an object of the present invention to provide a novel lighting assembly of the type indicated above which is not subject to the disadvantages heretofore encountered in assemblies of this type and which is possessed of the desirable features which have been set forth.

A more particular object of the present invention is to provide a lighting assembly, particularly for small light bulbs, which consists of a minimum of components, utilizes none of the conventional screw or bayonet-type connections, and requires no tools for its assembly and disassembly.

A further object of the invention is to provide such a lighting assembly which permits replacement of a burned-out or otherwise defective light bulb in a quick and simple manner, without resort to the use of any tools at all, and without requiring any mechanical or electrical skills on the part of a person effecting such exchange.

SUMMARY OF THE INVENTION

In accordance with one feature of my invention I provide a lighting assembly of the type discussed which comprises a tubular first member having opposite open ends and an inner circumferential surface which extends between these ends. First electrically conductive means constitutes a part of the assembly and includes two electrically conductive first terminals which is extended into the tubular member from one towards the other of the aforementioned ends, such first terminals overlapping the inner circumferential surface of the tubular first member at angularly spaced locations and being out of electrical contact with one another. A second member comprises a holding portion and a connecting portion the latter being dimensioned so as to be receivable in the other open end of the tubular first member with a wedge action. The connecting portion is provided with an outer circumferential surface which is adapted to frictionally engage the inner circumferential surface when the connecting portion is received in the aforementioned other open end of the tubular first member. Finally, a second electrically conductive means is provided and is carried by the holding portion of the second member. This second electrically conductive means, which will usually be a light bulb but may also be another element, includes two electrically conductive second terminals which overlie the outer circumferential surface of the connecting portion of the second member and which are so positioned that they will be wedged into current conducting contact with the respective first terminals when the connecting portion is received in the other open end of the tubular member.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front elevation of an assembly according to the present invention;
FIG. 2 is a top-plan view of FIG. 1;
FIG. 3 is a side-elevation view of FIG. 1 as seen in the direction of the arrow III associated with FIG. 1;
FIG. 4 is a partly sectioned bottom plan view of FIG. 3;
FIG. 5 is an elevational view of one element of the embodiment illustrated in FIG. 1, but omitting the cover which closes the lower end of the assembly;
FIG. 6 is a bottom-plan view of FIG. 5;
FIG. 7 is a side view of FIG. 5 as seen in the direction of the arrow VII associated with FIG. 5;
FIG. 8 is a top-plan view of FIG. 5;
FIG. 9 is a sectional elevation of the embodiment illustrated in FIG. 1, but omitting the cover which closes the lower end of the assembly;
FIG. 10 is a section taken on the line X-Y of FIG. 11; with the bottom cover shown in open position and with the lamp and the member which holds the lamp being omitted for clarity;
FIG. 11 is a plan view of FIG. 10;
FIG. 12 is a detail view of one of the terminals employed in my novel assembly;
FIG. 13 is a side view of FIG. 12 as seen in the direction of the arrow XIII associated with that figure; and
FIG. 14 is a plan view of FIG. 13.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussing now the drawing in detail, it will be seen that my novel assembly comprises a tubular member 1 which may or may not be of cylindrical configuration. A second member 2 is partly received in one open end of the tubular member 1 and the second member 2
Each of the terminals 9 is located in one of the wider groove portions in the manner illustrated in FIG. 10 and it is clear that any pull exerted on the respective wires 6 in the direction towards the bottom open end of the tubular member 1 will be incapable of dislodging the respective terminal 9 because of the abutment shoulder 12, as clearly shown in FIG. 10. The bulb-holding member 2 is most clearly illustrated in FIGS. 5-9. It will be seen particularly in FIG. 9, that the member 2 is provided with a first or outer portion having therein a recess 15 which is adapted to accommodate the lower end of a bulb, as shown in FIGS. 5 and 7. A second portion projects from the first portion, or constitutes an extension thereof, and this second portion is identified with reference numeral 13. It is bounded by an outer circumferential surface (not identified with a reference numeral) and a pair of bosses or internal passages 14 connect the recess 15 with this second portion, at which the bulb 16 is retained, as seen in FIG. 9. Thus, when the lower end of a bulb 16 is received in the recess 15, as shown in FIG. 5, the terminals 17 of the bulb 16 are extended through the bores 14, and are then bent over in the manner illustrated in full lines in FIGS. 5 and 7 and in dashed lines in FIG. 9. This arrangement extends thus over the throbber, projecting portion 13 and, the latter being configured so as to be received with a wedge action in the tubular member 1 as shown particularly in FIG. 9, the terminals 17 will be wedged into electrically conductive engagement with the terminals 9 when the member 2 is introduced into the member 1 in the manner illustrated in FIG. 9. This effects electrical connection of the bulb 16—or analogous element—with the wires 6 and thus with whatever source of electrical energy to which these wires 6 are connected. The member 2 is retained within the member 1 by wedge action because of their frictional engagement resulting from their respective dimensions. This is assisted by provision of the curved surface 18 (compare FIG. 7) provided for this purpose. Advantageously the members 1, 2 and 3 consist of synthetic plastic material, such as vinylchloride or polypropylene, which is not only electrically insulating but which may also be resilient to enhance the frictional retention of the member 2 in the member 1. It will be obvious that my novel assembly as herein disclosed by way of an exemplary embodiment dispenses with screw or solder connections which, when they corrode or become loosened are very frequently the cause of difficulties in conventional assemblies of this type. Furthermore, my novel assembly is very simple to manufacture and can be assembled by persons who are completely unskilled and without the use of any tools whatsoever. This reduces not only the expenditure for materials, but also the expenditure for tools and training, as well as reducing the assembly costs by speeding the assembly. Furthermore, replacement of a burned-out or otherwise defective light bulb can be effected rapidly and without requiring either the use of tools or the possession of mechanical or electrical skills on the part of the person carrying out such substitution, either by removing the bulb 16 with the member 2 as a sub-assembly and replacing them with a similar sub-assembly, in which form the replacement may be supplied or by simply removing the bulb 16 alone and inserting terminals 17 of a replacement bulb through the bores 14 and bending them into position as shown in the drawing. In either case the required operation can be carried out quickly and without any skill whatsoever. It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of assemblies, differing from the types described above.

While the invention has been illustrated and described as embodied in a lighting assembly, it is not intended to be limited to the details shown, since various modifications
and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art fairly constitute essential characteristics of the generic or specific aspects of this invention, and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims:

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. An assembly of the character described, comprising, in combination, a tubular first member having opposite open ends and an inner circumferential surface extending between said ends; first electrically conductive means, comprising two electrically conductive first terminals extending into said tubular member from one towards the other of said ends and overlaid said inner circumferential surface at angularly spaced locations and out of electrical contact with one another; a second member, comprising a holding portion of elastically yieldable material provided with a recess having a bottom wall, and a connecting portion projecting from said bottom wall and dimensioned so as to be receivable in said other open end with a wedge action, said connecting portion having an outer surface adapted to frictionally engage said inner circumferential surface when said connecting portion is received within the confines of the latter and said bottom wall being provided with a pair of bores which extend therethrough and terminate in said outer surface; and second electrically conductive means carried by said holding portion and including an electric light bulb clampingly retained in said recess and having two electrically conductive second terminals removably extending through said bores and comprising terminal sections overlaid said outer surface of said connecting portion and positioned to be wedged into current-conducting contact with the respective first terminals when said connecting portion is received in said other open end.

2. An assembly as defined in claim 1, wherein said first electrically conductive means comprises a pair of wire conductors, and wherein said first terminals each consist of a flat strip of electrically conductive material connected to one of said wire conductors in current-conducting relationship therewith.

3. An assembly as defined in claim 2, wherein a portion of each of said strips is crimped about the respective wire conductor associated with such strip for providing mechanical and electrical connection therewith.

4. An assembly as defined in claim 2, wherein said inner circumferential surface of said tubular member is provided with a pair of elongated grooves extending from said one toward said other open end and each including a wider portion dimensioned so as to receive one of said strips therewithin with one of its major surfaces facing the interior of said tubular member, and a narrower portion dimensioned to receive a portion of the respective wire conductor, whereby undesired withdrawal of the respective first terminals in direction toward said one open end is precluded.

5. An assembly as defined in claim 2, and further comprising a closing member for closing said one open end and comprising a first portion dimensioned to overlaid said one open end, and a second portion carried by said first portion and adapted to extend into said one open end for centering and frictionally retaining said closure member in predetermined position relative to said tubular member; said closure member having a peripheral edge portion provided with a pair of angularly spaced cut-outs each adapted to accommodate one of said wire conductors when said closure member closes said one open end.

6. An assembly as defined in claim 5, and further comprising hinge means connecting said closure member to said tubular member for hinged movement relative thereto between a position in which said closure member overlies said one open end closing the same, and a position in which said closure member is withdrawn from said one open end.

7. An assembly as defined in claim 6, wherein at least said tubular member, said closure member and said hinge means consist of electrically insulating synthetic plastic material, said hinge means being constituted by a web of said synthetic plastic material and being integral with said tubular member and said closure member.

8. An assembly as defined in claim 1, wherein said connecting portion of said second member tapers in direction away from said holding portion, whereby said outer circumferential surface of said connecting portion serves to center and guide the same during introduction into said other open end of said tubular member.

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313--315