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[54] **LIGHT BULB AND REFLECTOR ASSEMBLY**

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[52] **U.S. Cl.** ..... **240/41 BM,** 313/318, 339/119 L

[51] **Int. Cl.** **F21m 3/02**

[58] **Field of Search** ..... 240/41 BM, 52 R; 313/113, 313/318; 339/119 L, 127 R

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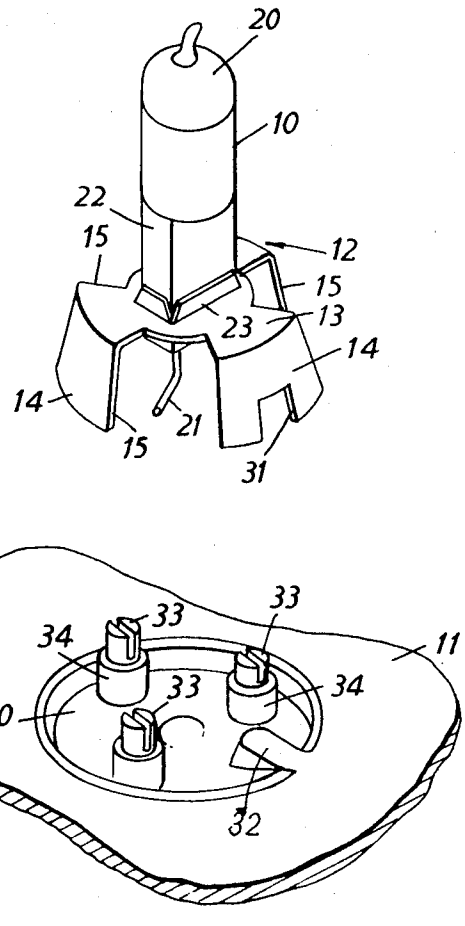
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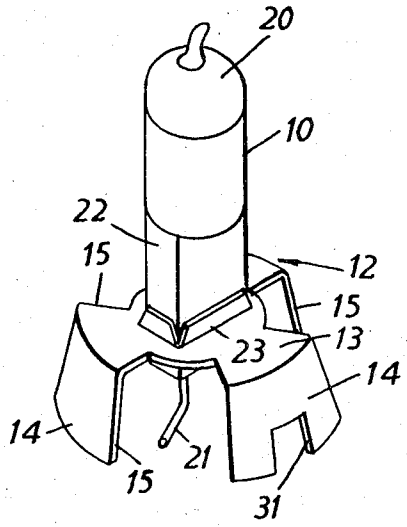
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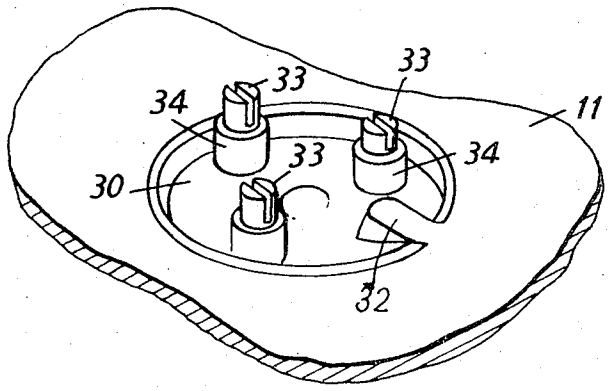
[57] **ABSTRACT**

A lighting unit, especially a sealed-beam unit, has a light bulb mounted on a reflector by a support member which embraces a press seal of the bulb and is secured in a depression in the reflector, the support member determining the spacing of the bulb from the reflector and also co-operating with the reflector to define the angular position of the bulb. Electrical connections to the lamp are made separately by pins sealed through the reflector.

7 Claims, 1 Drawing Figure




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LIGHT BULB AND REFLECTOR ASSEMBLY

The present invention relates to a light bulb reflector assembly such as may be used in a sealed-beam lighting unit for road vehicles and the like or in demountable systems such as open face vehicle lamps.

The sealed-beam lamp construction commonly includes three main components: a light source, a front element and a rear element. The front and rear elements, which together define a chamber enclosing the source, either incorporate or themselves consist of a lens and a reflector respectively. Sometimes, a lamp has to operate in corrosive or contaminant-laden environments including humid air. A sealed-beam lamp is particularly useful for such purposes because sensitive optical surfaces, e.g. its reflector, as well as the source itself, are protected within the sealed structure. The sealed-beam construction is well adapted to the production of rugged lamps capable of effectively resisting jarring and vibration. Since precise relative positioning of the various optical components can be maintained in service, sealedbeam lamps are regarded as being particularly useful for road vehicle, marine and aircraft lighting. Other applications include image projection devices, portable lamps including flashlamps, signal lamps, spotlamps, floodlamps, and street-lighting units.

The present invention provides a mounting arrangement for fitting a light bulb to a reflector in a predetermined position which facilitates accurate mounting of an independently manufactured bulb to a reflector by the manufacturer of the lighting unit. Such an arrangement is of particular value for sealed-beam lighting units.

In accordance with the present invention a lighting unit has a light bulb mounted on a reflector, the bulb having a press seal at one end and being supported wholly and in front of and in predetermined spaced relation to the reflecting surface of the reflector by a support member which embraces the said press seal and is secured to the reflector, the said reflecting surface having a formation which mates with the support member to locate the bulb in the said spaced relation.

The light bulb may be a tungsten halogen lamp or a discharge lamp.

Conveniently the support member is in the form of a collar having a web portion, which is apertured to accept the press seal of the bulb, and a flange portion which mates with the reflector. The depth of the flange, measured from the web portion, governs the distance of the source from the adjacent, open part of the reflector. Advantageously, the periphery of the collar has one or more cut-outs providing access for tools used to make electrical connections between lead-in conductors to the source and corresponding contacts borne by the rear reflective element. Where three lead-in connections have to be made, the collar may have three cut-outs and thus assume the form of a spider.

The collar can be attached to the press seal of the source envelope directly, or to a capping box which surrounds the actual seal. The collar can be fabricated from plastics materials or sheet metals.

In a preferred embodiment, the mating contour of the rear reflector element is a circular ridge or depression therein. Where it is desired to centre the source upon the principal or optical axis of the rear element, which may be of e.g. spherical, parabolic or elliptical

form, the ridge or depression is centred upon the optical axis of the rear element, the source being centred with respect to its collar. Since the periphery of the collar conforms in shape and size to the ridge or depression, the source is centred upon the optical axis when the collar is mated with the ridge or depression. Co-operating keying means may be provided on the collar and rear element respectively to provide for angular alignment of the collar and source with the rear element.

Where the collar and the rear element are metallic, the two can be secured together by soldering, welding or brazing. Alternatively, adhesive such as epoxy-resins can be used; bonding in this way is suitable when one or both parts are non-metallic.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawing, in which the sole FIGURE is a partial, exploded perspective view of a sealed-beam lighting unit.

The front, lens element of the unit has been omitted from the drawing and the rear reflector element is only shown in part for clarity. It will be understood that the relative positions of the front and rear elements are important if desired light distribution is to be gained. Details of the ways in which the front and rear elements are combined do not form part of this invention, are well understood in the art and will not be described.

For the sake of convenience, the illustrated lighting unit will be described as a twin filament automobile headlamp of the dipping type. The unit has a twin-filament tungsten halogen source **10** which is mounted in proximity to the rear reflector element **11** by a shaped metal support collar **12.** The collar **12** has a webportion **13,** in which there is a centrally-disposed rectangular opening, and a flange portion **14** whose periphery is of circular outline when seen in plan. Three cut-outs **15** intersect the web **13** and the flange portion **14** whereby the collar **12** assumes the form of a spider. The cut-outs **15** are provided for a purpose to be described.

The source **10** has a transparent vitreous envelope **20,** the lower end of which has a press seal about three lead-in conductor wires **21** — only one of these is visible in the drawing. The press seal portion is embraced by the rectangular opening of the collar, and in this case there is a metallic capping box **22** which surrounds the press seal itself. Ears **23** bent out from the collar **12** are soldered, welded or brazed to the capping box **22.** The capping box may be provided with locating means which cooperate with the collar **12** to position the latter a given distance away from an internal reference point within the envelope **20.** The reference may be at a defined point on one of the two filaments.

The internal face of the rear element **11** has a depression **30** of a circular outline forming a seating for the collar **12.** The radius of the circular depression conforms accurately to the radius of the conformingly-shaped flange portion **14,** measured at the lower free edge thereof. Furthermore, the depression is centred upon the optical axis of the rear element **11.** In the assembled dippable headlight unit, therefore, at least one filament will be centred upon the said axis. The distance between the said free edge and the above-mentioned internal reference point, in conjunction with the depth of the depression, is chose to be such that one filament reference point is located at a princi-

pal focus of the rear element **11.** Other types of lighting unit may demand different source/rear element geometries, as the lamp developer will recognise and for which he can readily evolve appropriate designs.

The collar **12** and rear element **11** are provided with cooperating keying means which ensure that the collar and source can only be fitted together in one predetermined angular orientation. This is necessary because when a dippable automobile headlamp unit is mounted on an automobile, one filament must be situated in a given plane to ensure proper horizontal cut-off of the projected light. The keying means consist of a notch **31** in the flange portion **14** and a projection **32** from the base of the depression **30.**

The purpose of the previously-mentioned cut-outs **15** is to facilitate the making of electrical connections to the lead-in conductors **21.** The twin-filament source **10** has three conductors **21** and correspondingly the rear element **11** bears three contacts therefor. The contacts are terminal pins **33** which are sealed to the rear element **11** and pass therethrough for connection to an external electrical supply. Each pin **33** has a transverse slit, as shown, to accommodate the tail of a respective conductor **21.** The conductor **21** is mechanically secured to its pin **33** by squeezing or crimping the pin so as to close the slit firmly against the conductor. The cut-outs **15** provide access for tooling used to close the slit. Alternative connections of a similar nature can be employed instead, as well as conventional soldered connections.

As shown, the pins **33** have surrounding sleeves **34** which are of insulating material, e.g., glass. The sleeves **34** isolate the pins **33** electrically from the rear element **11** which is assumed to be a sheet metal pressing. The sleeves **34** are sealed or bonded to the rear element **11** and pins **33.** If the rear element **11** itself is made from an insulating material, the sleeve **34** could be omitted.

The collar **12** is secured to the rear element **11** by any suitable means. Where both the collar **12** and the element **11** are metallic, they can be joined together by soldering, brazing or welding. Alternatively, they could be bonded together by an adhesive such as an epoxy resin. The latter method is satisfactory for joining collars **12** and elements **11** one or both which is non-metallic.

It will be recognized that the supporting collar **12** can be readily adapted to enable a variety of lamp designs having press seals to be securely mounted within sealed beam units.

We claim:

1. In a lighting unit having a reflector and a light bulb supported in spaced relation to the reflecting surface of the reflector, said light bulb having a press seal at one end thereof, the improvement comprising a support member having a web portion, said press seal extending through and being held by said web portion and said web portion extending outwardly from the press seal, and a flange portion extending from the periphery of the web portion towards the reflector, and a depression in the reflecting surface of the reflector, said flange portion of the support member mating with the depression to locate the bulb in the said spaced relation.

2. A lighting unit as claimed in claim **1** wherein said support member comprises a capping box embracing the said press seal and attached to said web portion.

3. A lighting unit as claimed in claim **1** in which the depression is of circular outline and is centred upon the principal axis of the reflector and the bulb is centrally located on the support member whereby the bulb is located centrally with respect to the said axis.

4. A lighting unit as claimed in claim **3** wherein the reflector has terminal contact pins passing therethrough within the outline of said depression and the bulb has electrical lead-in conductors attached to the said contact pins.

5. A lighting unit as claimed in claim **4,** wherein said flange portion of said support member has at least one cut-out providing access for tooling to connect said lead-in conductors to said contact pins.

6. A lighting unit as claimed in claim **1,** wherein said reflector and said support member have a projection and a notch, respectively co-operating to establish the relative angular position of the bulb and the reflector.

7. In a sealed-beam lamp having a light bulb wholly enclosed between a reflector and a lens member, the light bulb having a press seal and being supported in spaced relation to said reflector, the improvement comprising a support member having a web portion in the form of a disc with a central aperture which embraces the press seal and a flange portion extending from the periphery of said disc and secured in a circular depression in the surface of the reflector, said flange portion having a notch co-operating with a projection in said depression to locate the bulb in a desired angular position relative to the reflector and said support member defining the spacing of said bulb from said reflector.

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