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Green

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[54] **VEHICLE LAMPS**

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[52] **U.S. Cl.** ..... **240/103 R,** 240/41.35 R

[51] **Int. Cl.** **F21v 7/10**

[58] **Field of Search** ..... 240/41.35 R, 41.36, 46.51, 240/103 R, 103 A, 103 C; 113/116 A

[56] **References Cited**

UNITED STATES PATENTS

805,247	11/1905	Thompson	113/116 A
865,173	9/1907	Eichberg	113/116 A
1,637,429	8/1927	Stewart	240/46.51
2,784,306	3/1957	Johnson	240/103 C X
2,907,873	10/1959	Smith	240/103 R
3,541,326	11/1970	Durr	240/103 A

FOREIGN PATENTS OR APPLICATIONS

845,483	7/1952	Germany	240/41.35 R
562,590	5/1957	Italy	240/41.35 R

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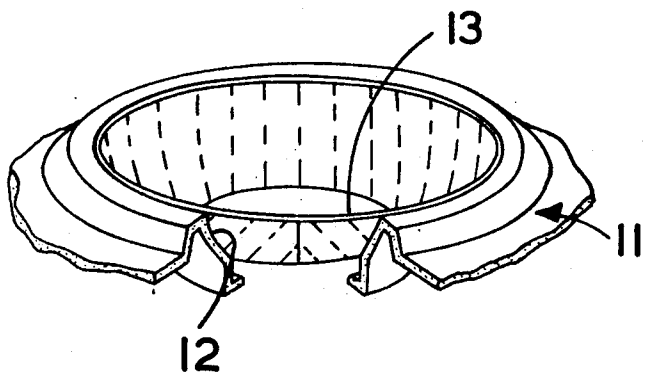
[57] **ABSTRACT**

A vehicle lamp comprising a body having a non-developable recess therein to receive a bulb, and a reflector lining the recess. The reflector is formed from a sheet of reflective material which has slits therein to enable it to be deformed to conform to the shape of the recess.

6 Claims, 4 Drawing Figures



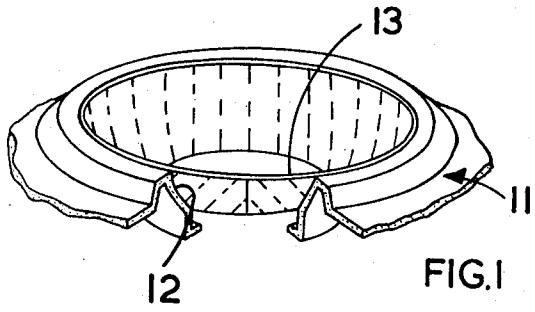


FIG. 1

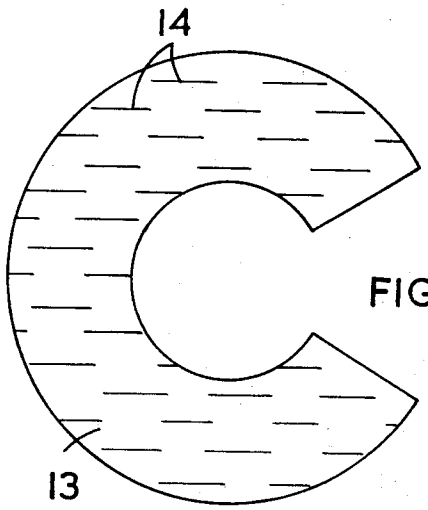


FIG. 2

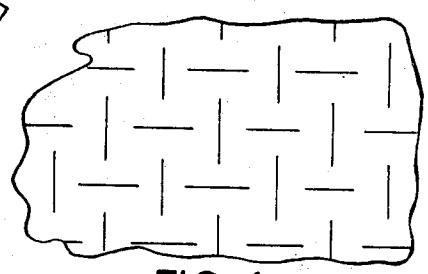


FIG. 4

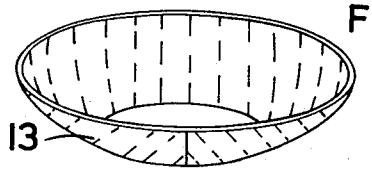


FIG. 3

VEHICLE LAMPS

This invention relates to vehicle lamps.

A lamp according to the invention includes a lamp body having therein a recess within which a bulb is located in use, and a reflector positioned within the recess, the shape of said recess being non-developable and the reflector being constituted by a sheet of reflective material in facial contact with the surface of the recess and having therein a plurality of slits, the sheet following the surface of the recess as permitted by said slits and being secured to said surface.

Preferably the reflective material is self-adhesive.

Alternatively the surface of said recess is provided with a layer of adhesive prior to insertion of said sheet of reflective material.

Preferably said recess is in the form of a frustum and the sheet is in the form of an annulus having a segment thereof missing, the sheet being flexed to frusto-conical form and then distended, as permitted by the slits, to follow the surface of the recess.

The invention further resides in a method of providing a reflector within a lamp body having a recess therein of non-developable shape, the method comprising forming a sheet of reflective material, having a plurality of slits therein, to the shape of annulus having a segment thereof missing, flexing the sheet to frusto-conical form, inserting the flexed sheet into said recess, distending the flexed sheet, as permitted by the slits therein, to follow the surface of the recess, and securing the sheet to the surface of the recess.

One example of the invention is illustrated in the accompanying drawings wherein:

FIG. 1 is a perspective view, partly broken away, showing a vehicle lamp,

FIG. 2 is a plan view of a sheet of reflective foil from which the reflector of the lamp is formed,

FIG. 3 is a perspective view showing how the sheet is flexed, and FIG. 4 is a diagramatic representation of an alternative slit pattern for the sheet.

Referring to the drawings, the lamp includes a metal lamp body **11** which in use is secured to a body panel of a road vehicle. The body **11** is formed with a recess **12** the surface of which is generally paraboloidal. Thus the surface **12** is non-developable, that is to say cannot be represented in a single plane without distortion thereof. The wider open end of the recess is normally closed by a lens which may be coloured in the usual manner, and the opposite, narrower end of the recess is closed by a bulb holder (not shown) which in use supports a bulb within the recess **12.**

In order to improve the efficiency of the lamp there is provided a reflector **13,** the reflector **13** being constituted by a sheet of reflective foil which is secured to the surface of the recess **12.** The reflector **13** is formed by cutting a flat sheet of reflective foil to the form of an annulus having a segment thereof removed (FIG. **2**). The sheet of reflective foil from which the annulus is cut is formed with a plurality of spaced, parallel slits **14** the slits being arranged in parallel spaced rows, with the slits of each row spaced from one another. The slits of each row are also displaced from the slits of the adjacent rows along the length of the rows.

The annulus cut from the sheet is flexed to form the frusto-conical shape shown in FIG. **3,** the angle of the frustum being dependent upon the radii of the annulus, and the angle subtended by the missing segment, and

being so chosen that the frusto-conical form will fit inside the recess **12.** One surface of the foil is highly reflective, and the other surface of the foil is provided with an adhesive coating, the frustum being formed with the adhesive coating on its outer surface, and the highly reflected surface innermost.

The dimensions of the annulus cut from the sheet are such that when the frustum is inserted into the recess **12,** then the opposite ends of the frustum respectively engage opposite ends of the recess. The frustum is then distended outwardly to follow the shape of the recess **12,** and is pressed firmly against the surface of the recess **12,** so that the adhesive provided on the frustum secures the foil to the body **11.** The distension of the frustum is permitted by the slits **14** provided in the foil, and the slits **14** permit distension such that the foil follows the surface of the recess **12** without ripping, or creasing of the foil.

In a modification there is no adhesive on the foil, but the inner wall of the recess **12** is coated with an adhesive prior to insertion of the frustum into the recess.

It will further be appreciated that the recess in the body need not be paraboloidal, the sheet of foil being cut to a suitable shape so that when flexed, and distended, it will follow the surface of the recess. In a modification the foil is spot welded to the body **11.** As an alternative to the use of foil for the sheet, the sheet could be an aluminised synthetic resin material.

FIG. **4** shows an alternative slit pattern where two sets of slits at 90° to one another facilitate distensions of the sheet in all directions. Where the recess in the body is of circular cross-section it will be appreciated that the slit pattern of the sheet of reflective material could consist of slits aligned in concentric circular rows having their centre on the axis of the annulus of reflective material.

I claim:

1. A vehicle lamp including a lamp body having therein a bulb receiving recess, and a reflector positioned within said recess, the shape of said recess, as defined by its inner surface, being non-developable and said reflector being constituted by a sheet of reflective material lying against the whole of said inner surface of said recess and having a plurality of slits therein, said slits extending over substantially the whole of said sheet, and said sheet following said surface of said recess and being secured to said surface.

2. The lamp according to claim **1** wherein said slits are arranged in parallel, spaced rows with the slits of each row being spaced from one another, and the slits of each row being opposite the spaces between the slits of adjacent rows.

3. The lamp according to claim **1,** in which said sheet of reflector material is self-adhesive.

4. The lamp according to claim **1,** wherein said recess, as defined by said inner surface, is in the form of a distended frustom, and said sheet is in the form of an annulus having a segment thereof missing, said sheet being flexed to frusto-conical form and then distended to follow said inner surface of said recess.

5. The lamp according to claim **1,** wherein the slits are formed in said sheet as two sets of slits which are disposed at 90° to one another.

6. A method of providing a reflector within a lamp body having a recess therein of non-developable shape, the method comprising the steps of forming a sheet of reflective material to the shape of an annulus having a

segment thereof missing, slitting said sheet at a plurality of locations extending over substantially the whole of the surface thereof, flexing said sheet to frusto-conical form, inserting said flexed sheet into said recess, distending said flexed sheet to follow the surface of said recess, and securing said sheet to said surface of said recess.

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