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(12) # EUROPEAN PATENT APPLICATION

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(54) **A floodlight reflector.**

(57) A floodlight reflector which provides for the desensitizing of manufacturing imperfections and/or variations through the use of flutes the planes of which are spaced at least 15° away from a plane containing a linear light source.

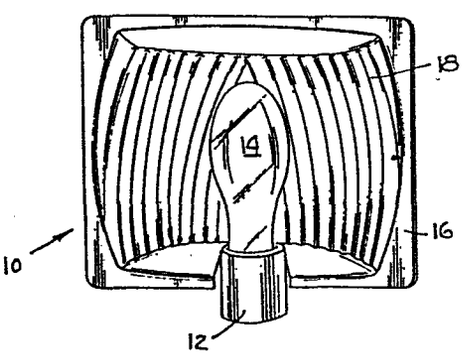

Fig. 1

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FLOODLIGHT REFLECTOR PROVIDING FOR DESENSITIZING OF MANUFACTURING IMPERFECTIONS OR VARIATIONS

The present invention relates to a floodlight reflector and more particularly to a floodlight reflector which provides for the desensitizing of manufacturing imperfections and/or variations.

In the design of reflectors, certain light patterns or distributions of light are strived for and while it is theoretically possible to make a light pattern appear very smooth and continuous as it strikes a surface to be lighted, there are many real-life variables that tend to prevent this goal from being achieved. For instance, the translation from drawings to tool manufacturing may not be perfect, manufactured parts may not conform perfectly to the tool (known as the effect of spring-back of metal), the arc tube may not be perfectly centered within the light source envelope causing the light source to be positioned in the reflector at a position other than that designed for the reflector assembly, and the finishing on the reflector surface may not be perfect.

All of these variations and imperfections may cause striations or some other deviation from a perfect light distribution since the plasma stream of the light source itself is a very fine line of light, effectively 1/8 of an inch in diameter or less.

It is an object of the present invention to provide a means of desensitizing the reflector to these manufacturing imperfections or variations.

Summary of the Invention

Accordingly, the present invention provides a floodlight reflector and means provided in said reflector for desensitizing the reflector to imperfections encountered in the manufacturing, finishing and light center positioning in the reflector. The reflector includes flutes serving as diffusing elements planes of which are spaced at least 15° from a plane embodying a linear light source.

Brief Description of the Drawings

Fig. 1 is a front elevation view of a luminaire including a reflector in accordance with the present invention.

Fig. 2 is a perspective view of a reflector constructed in accordance with the present invention.

Fig. 3 illustrates the manner in which fluted or otherwise contoured lines of diffusion in a reflector spread or spray light over an angular range.

Fig. 4 is an exploded view of Fig. 3 further illustrating the fluted or otherwise contoured lines of diffusion spreading or spraying light over an angular range.

Fig. 5 illustrates a piece of cardboard lining up with (and therefore representing a plane including) a path of the diffusing elements which cuts through a linear light source but couldn't possibly contain every element of it.

Detailed Description of the Invention

Referring to the drawings wherein like components are indicated by like reference numerals throughout the figures, Fig. 1 illustrates a luminaire arrangement embodying a reflector according to the present invention. As seen in this figure, the arrangement generally designated by a reference numeral 10 includes a suitable socket arrangement 12 adapted to receive a linear light source 14 and a reflector 16. The reflector 16 is provided with a plurality of flutes 18 to provide the lines of control surface change necessary to achieve desensitization of the light from the pencil light source 14.

In cross-section, these fluted or otherwise contoured lines of diffusion act as shown in Fig. 1 and the exploded view Fig. 2. At any given location on the reflector, a ray from the linear light source such as ray I_1 would normally reflect as ray R_1. For the desensitization required, it is necessary for any given point to spread or spray the light over an angular range such as shown in Figs. 1 and 2 as exiting rays R1 through R2 to R3. This angular range is not critial except that the more imperfections encountered in the manufacturing, finishing and light center positioning in the reflector, the greater the angular range between R1 and R3 that is required.

While the cross-section of the flutes in the reflector can have a variety of geometric shapes including a circular one, in a preferred embodiment the flutes are portions of toroids (truncated toroids) each having an elliptical cross section. This is illustrated in Figs. 1 and 2 with the second focal point of the ellipse being at point P.

As mentioned previously the path of the elliptical elements is extremely critical. For example for the reflector to provide the best spread or diffusion of light, the path of the elliptical elements should be exactly parallel to the arc stream of the linear light source, that is the plane including the path of the elliptical elements should also include the linear light source so that the spreading action is exactly in a plane perpendicular to the arc stream of the linear light source. However, when the elliptical elements are parallel with the arc stream of the linear light source, the null lines between the elliptical elements will line up with or be exactly in the plane of the linear light source and this condition will produce a light and dark striation at each null point thereby producing more striations than existed without the diffusing elements.

In order to prevent this striation producing situation from occurring, a plane including the path of the diffusing elements must not be capable of containing the linear light source, but rather the plane of the diffusing elements must be at least 15° away from the plane containing the light source. As shown in Fig. 1, the flutes of the reflector are portions of toroids (truncated toroids) each having an elliptical cross-section. The path of revolution of the toroids is parabolic (following the parabolic sections of the reflector). The flutes 18 are also contiguous, with the planes containing the intersections of the flutes angularly displaced from the plane containing the linear light source by at least 15°.

Fig. 4 best illustrates this and shows a piece of cardboard 20 lining up with (and therefore representing a plane including) the path of the diffusing elements. It can be seen from this figure that the plane containing the diffusing element path can only cut through the linear source but could not possibly contain every element of it.

While the invention has been particularly shown and described in reference to a preferred embodiment thereof, it will be understood by those skilled in the art the various changes in form an details may be made therein without departing from the spirit and scope of the invention.

Claims

What is claimed is:

1. A luminaire arrangement comprising a linear light source, a reflector and means provided in said reflector for desensitizing the reflector to imperfections enountered in the manufacturing, finishing, and light center positioning in the reflector.

2. A luminaire arrangement as defined in Claim 1 wherein said desensitizing means include diffusing elements, the planes of which are spaced 15° from a plane embodying said linear light source.

3. A luminaire arrangement as defined in Claim 2 wherein said reflector is a parabolic reflector.

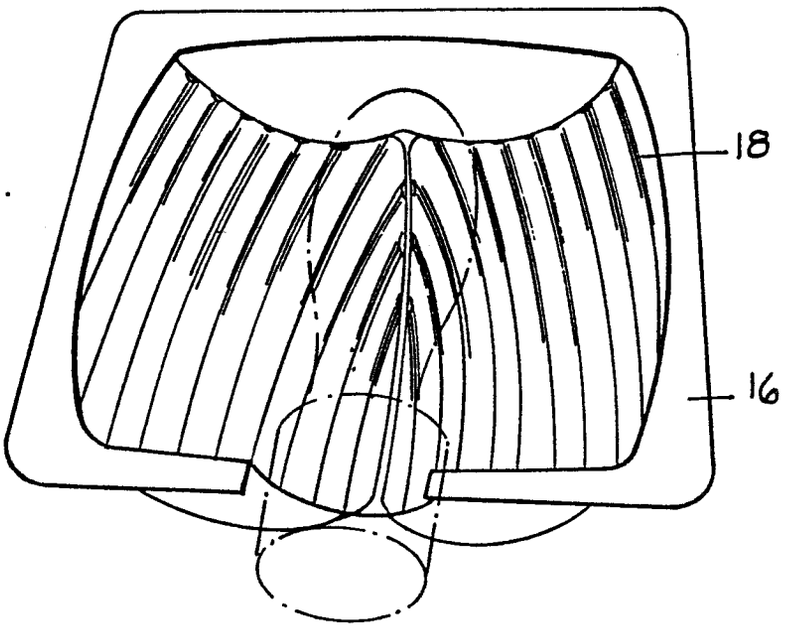
4. A luminaire arrangement as defined in Claim 2 wherein said diffusing elements include flutes.

5. A luminaire arrangement as defined in Claim 4 wherein said flutes are portions of truncated toroids each having an elliptical cross section.

6. A luminaire arrangement as defined in Claim 5 wherein the path of revolution of each of the toroids is parabolic.

7. A luminaire arrangement as defined in Claim 5 and/or Claim 6 wherein said flutes are contiguous and planes embodying the interesection of the flutes are angularly displaced from a plane embodying the linear light source by at least 15°.

Fig. 2.



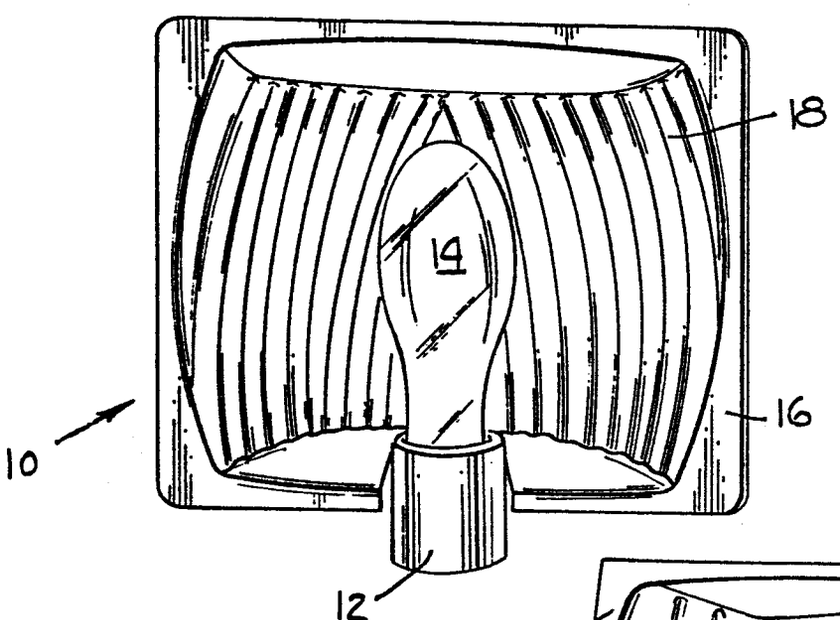


Fig. 1.

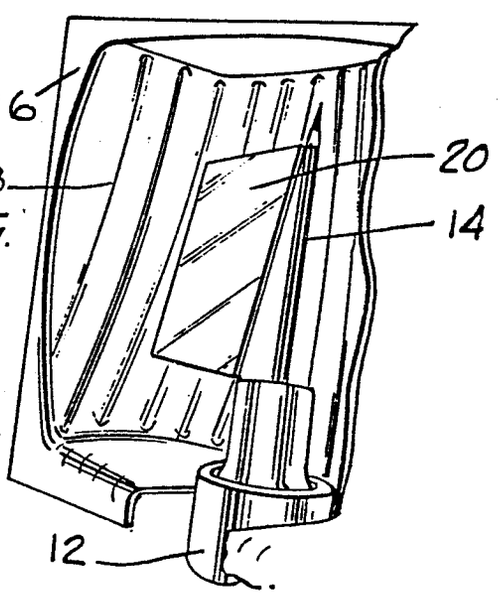


Fig. 5.

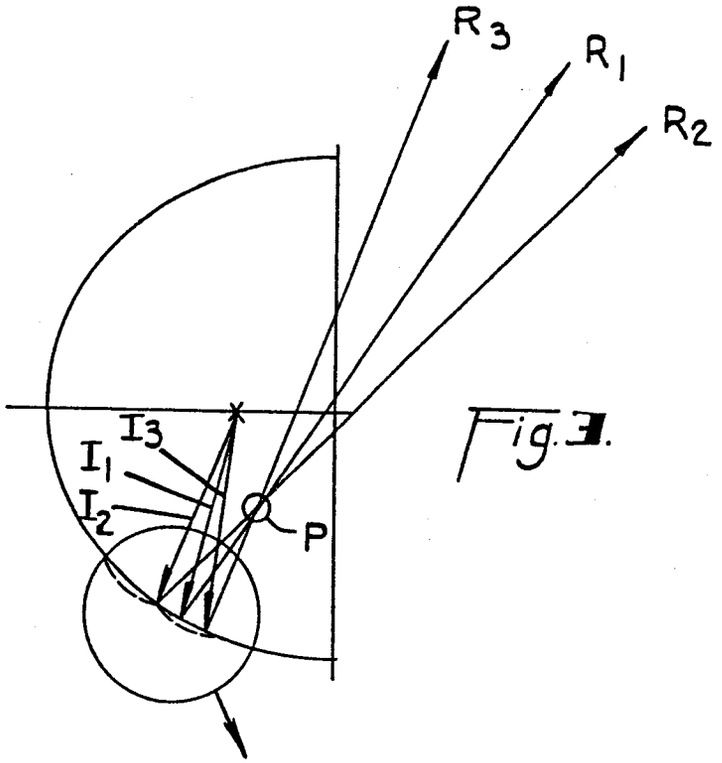


Fig. 3.

Fig. 4.