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(54) Light fitting.

(57) A light fitting 1 comprising a light source 6 and reflector means 7 characterised in that the reflector means comprises a concave or quasi-concave, primary reflector located to one side of the light source and in spaced relationship therefrom and of such shape principally to reflect light towards the zone 13 to be illuminated; and a convex or quasi-convex, secondary reflector 8 located to another side of the light source 6 and also in spaced relationship therefrom and of such shape as principally to reflect light towards the primary reflector 7, with the secondary reflector 8 impervious to visible light rays and of such dimensions as to mask, wholly or substantially, the light source 6 from the view of an observer 10.

EP 0 378 918 A1

LIGHT FITTING

This invention relates to a light fitting particularly though not exclusively for industrial use, at any elevated location, e.g. to illuminate high bay racking, storage areas, warehousing, machinery etc.

Conventional fittings comprise a fluorescent tube with a reflective surface, which may be curved, at a spaced location above the tube to direct light downwardly. The tube is normally exposed to direct view by an observer positioned beneath the fitting, e.g. at floor level, producing discomfort in the form of glare, or even disabling glare, whilst furthermore, tests have shown that there is an uneven distribution of light from top to bottom of say racking being illuminated by a fitting, with greater intensity towards the top of the racking.

According to the present invention there is provided a light fitting comprising a light source and reflector means characterised in that the reflector means comprises a concave or quasi concave, primary reflector located to one side of the light source and in spaced relationship therefrom and of such shape principally to reflect light towards the zone to be illuminated; and a convex or quasi convex, secondary reflector located to another side of the light source and also in spaced relationship therefrom and of such shape as principally to reflect light towards the primary reflector, with the secondary reflector impervious to visible light rays and of such dimensions as to mask, wholly or substantially, the light source from the view of an observer.

Thus, with the fitting in accordance with the invention suspended at an elevated location, e.g. above a bay between two rows of racking of say 10m height, the primary reflector would be above the light source, whilst the secondary reflector would be below the light source, and the light source is obscured from the view of a lower observer by the secondary reflector, and consequently the observer is not subjected to glare, even when looking upwardly e. g. during the course of inserting or removing articles or pallets for instance, into or from the racking. Furthermore, still considering the suspension of a fitting above a bay between two rows of racking, whilst the principal purpose of the primary reflector is to direct light downwardly - and of course for any particular installation the fitting is located at such a height, and the primary reflector is of such shape as to illuminate the racking etc., involved in an optimum manner - the principal reflective purpose of the secondary reflector is to direct light upwardly onto the primary reflector, so that more light is directed into the racking etc., than with prior art proposals, as the primary reflector reflects not only light received directly from the light source but also light received indirectly via the secondary reflector into the racking etc., as light that would traditionally be directed towards the observer is now redirected into the racking. Furthermore, tests have revealed an additional advantage in that a more even spread of intensity of illumination is attained than that achievable with traditional fittings. Whilst, as indicated above, the majority of the light received at the secondary reflector is reflected back to the primary reflector, a minor proportion is reflected outwardly and downwardly into the racking etc.

The above has considered the installation of a fitting in accordance with the invention at an elevated location, to direct light outwardly and downwardly. It will be appreciated however that some installations may demand the location of the same fitting at a lower level, e.g. floor level, to direct light upwardly and outwardly. Furthermore, for symmetrical distribution of light to each side of the fitting, the primary and secondary reflectors would be located 180° apart and the 180° plane may be vertical (to distribute light either downwardly and outwardly, or upwardly and outwardly) or horizontal in the case of say an inspection fitting, or at some intermediate angle. Also, some installations may require asymmetrical distribution, in which case the primary and secondary reflectors would not be located at 180° but would be at some other angle.

The light source is preferably one or more fluorescent tubes, although other light sources more appropriate to a particular installation may of course be used in a fitting in accordance with the invention. Consequently, if the fitting is provided with a single fluorescent tube, and as industry-standard tubes have external diameters of approximately 26mm and 38mm, then the secondary reflector would need to have an overall transverse dimension exceeding 26mm and 38mm in order to mask such a tube effectively. Preferably, even with a single fluorescent tube, the secondary reflector would have an overall transverse direction substantially exceeding the tube diameter. For instance, the transverse dimension could be of the order of 200mm, so as to mask the tube effectively, even when an observer is not directly beneath, but to one side of, the fitting. It follows, that with a fitting provided with twin or other multiple tubes, the masking dimensions of the secondary reflector need to be suitably increased. As to longitudinal dimensions, with a fluorescent tube of industry-standard length e.g. 2.5m (8ft), 1.8m (6ft), 1.5m (5ft) or 1.2m (4ft), the secondary reflector would

need to correspond to this length, whilst the fitting would also need to approximate to this length.

The concavity of the primary reflector and convexity of the secondary reflector may be produced by rolling e.g., an aluminium alloy sheet or stainless steel sheet, to a true geometric curve e.g., a parabola, or the overall concave and convex shapes of the primary and secondary reflector respectively are produced by a multi-faceted construction, as manufacturing methods require.

The reflectors may be of such material thickness and/or construction that they are self-supporting over e.g. a 2m length, and consequently are mountable at their ends to support means. In this connection the reflectors may be supported from a sheet metal casing or support structure, or by clips directly or indirectly to the tube itself. Both the primary and secondary reflectors conveniently have a silvered reflective surface.

The invention will now be described in greater detail by way of example, with reference to the accompanying drawing, which indicate diagrammatically a light fitting 1 in accordance with the present invention suspended at an elevated position above the floor 2 of a bay 3 defined between two rows of racking 4, 5.

The fitting 1 comprises a light source 6 in the form of a fluorescent tube, with a concave primary reflector 7 located above the light source 6, while a convex secondary reflector 8 is located beneath the light source 6, and is impervious to visible light rays. Furthermore, the secondary reflector 8 is of such lateral dimension 9 that the secondary reflector 8 masks the light source 6, wholly or substantially, from the view of an observer 10 anywhere in the bay 3.

The spacing between the reflectors 7, 8 and the light source 6 and the curvature of the reflectors is such that the primary reflector 7 is adapted principally to reflect light rays 11 from its silvered reflective surface 12 into an area 13 of the racking to be illuminated, while the secondary reflector 8 is adapted principally to reflect light rays 14 from its silvered reflective surface 15 towards the primary reflector 7, and additionally, but to a lesser extent, to reflect light rays 15 into another area 13 of the racking requiring illumination.

Whilst the primary and secondary reflectors 7, 8 could be produced by rolling aluminium sheet, or stainless steel sheet to a truly geometrical curve, the primary and secondary reflectors 7, 8 are preferably of a multi-faceted construction i.e. their "curvature" is built up from a plurality of flat strips or facets in which case the aluminium sheet is provided with a plurality of "bend" lines at the junction between adjacent edges of adjacent facets.

Claims

1. A light fitting (1) comprising a light source (6) and reflector means (7) comprising a concave or quasi-concave, primary reflector (7) located to one side of the light source (6) and in spaced relationship therefrom and of such shape principally to reflect light (11) towards the zone (13) to be illuminated; characterised in that the reflector means additionally comprises convex or quasi-convex, secondary reflector (8) located to another side of the light source (6) and also in spaced relationship therefrom and of such shape as principally to reflect light (14) towards the primary reflector (7), with the secondary reflector (8) impervious to visible light rays and of such dimensions as to mask, wholly or substantially, the light source (6) from the view of an observer (10).

2. A light fitting as claimed in Claim 1, for symmetrical distribution of light to each side of the fitting (1) characterised in that the primary and secondary reflectors (7, 8) are located 180° apart.

3. A light fitting as claimed in Claim 2, characterised in that the 180° plane is vertical, horizontal, or at an intermediate angle between vertical and horizontal.

4. A light fitting as claimed in Claim 1, for a symmetrical distribution of light from the fitting, characterised in that the primary and secondary reflectors (7, 8) are located at an angle other than 180°.

5. A light fitting as claimed in any preceding Claim, characterised in that the light source (6) is one or more fluorescent tubes.

6. A light fitting as claimed in Claim 5, characterised in that the secondary reflector has an overall transverse dimension (9) exceeding the external dimension of the tube (6), and a length corresponding to the length of the tube (6).

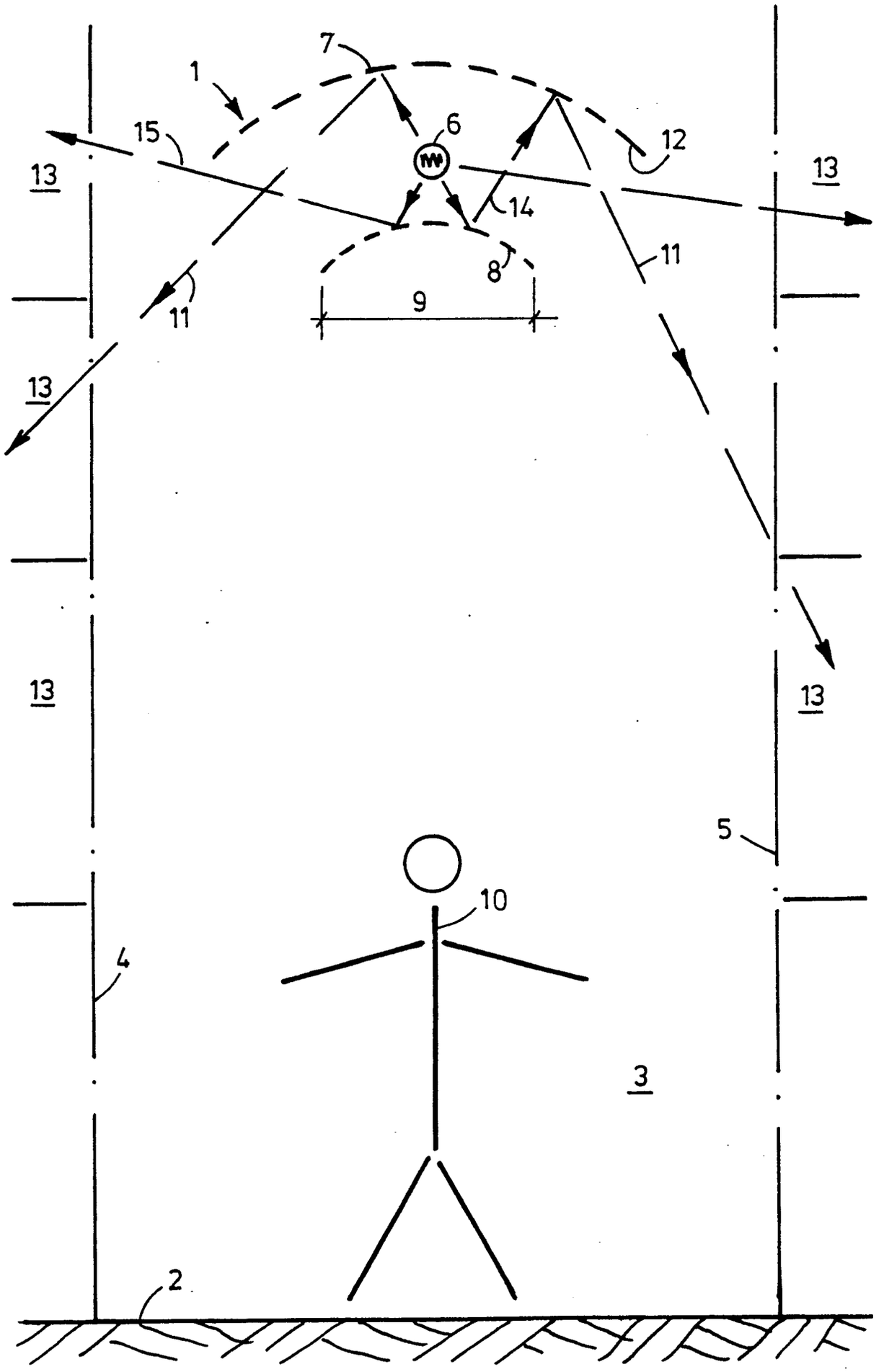
7. A light fitting as claimed in any preceding Claim, characterised in that the concavity of the primary reflector (7) and convexity of the secondary reflector (8) are produced by rolling to a true geometric curve.

8. A light fitting as claimed in any one of Claims 1 to 6, characterised in that the quasi-concavity of the primary and secondary reflectors (7, 8) is produced as a multi-faceted construction.

9. A light fitting as claimed in Claim 7 or 8, characterised in that the primary and/or secondary reflector (7, 8) is/are produced from aluminium alloy sheet, or stainless steel sheet.

10. A light fitting as claimed in Claim 9, characterised in that the primary and/or secondary reflector (7, 8) is/are of such material thickness and/or construction that it/they are self-supporting and consequently are mountable at their ends to support means.

11. A light fitting as claimed in any preceding preceding Claim, characterised in that both the primary and secondary reflectors (7, 8) have a silvered reflective surface.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EUROPEAN SEARCH REPORT

Application Number

EP 89 31 3171

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-3 749 906 (THIRY) * Claims 1-3,8-11; figures 1-6 *	1	F 21 V 7/00
Y	US-A-1 950 130 (BARLOW et al.) * Page 3, lines 102-112; claim; figure 10 *	1-3	
Y	EP-A-0 137 654 (ACHORLAND LTD) * Page 4, lines 22-26; claims 1,3,4,6; figure 2 *	1-3	
A		7,9	
A	US-A-4 386 392 (REIBLING) * Claim 1, figures 2,3,4 *	1-3	
A	GB-A-2 009 384 (SUN CHEMICAL CORP.) * Abstract; figures 5,7,9 *	5	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F 21 V
F 21 S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27-04-1990	MARTIN C.P.A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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