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(54) **Uplighter.**

(57) An uplighter has a lamp holder 4 and a reflector 18 which extends around and below the location of the lamp 7 held by the lamp holder in use of the device, so that in use of the uplighter light from the lamp is distrubuted upwardly. To provide an improved distribution of the light upwardly, the reflector 18 has, as seen in vertical section, a side wall face 20 which converges in the downward direction, an upwardly convex base wall face 22 and an upwardly concave valley face 21 which smoothly joins the lower edge of said side wall face to the periphery of the said base wall face.

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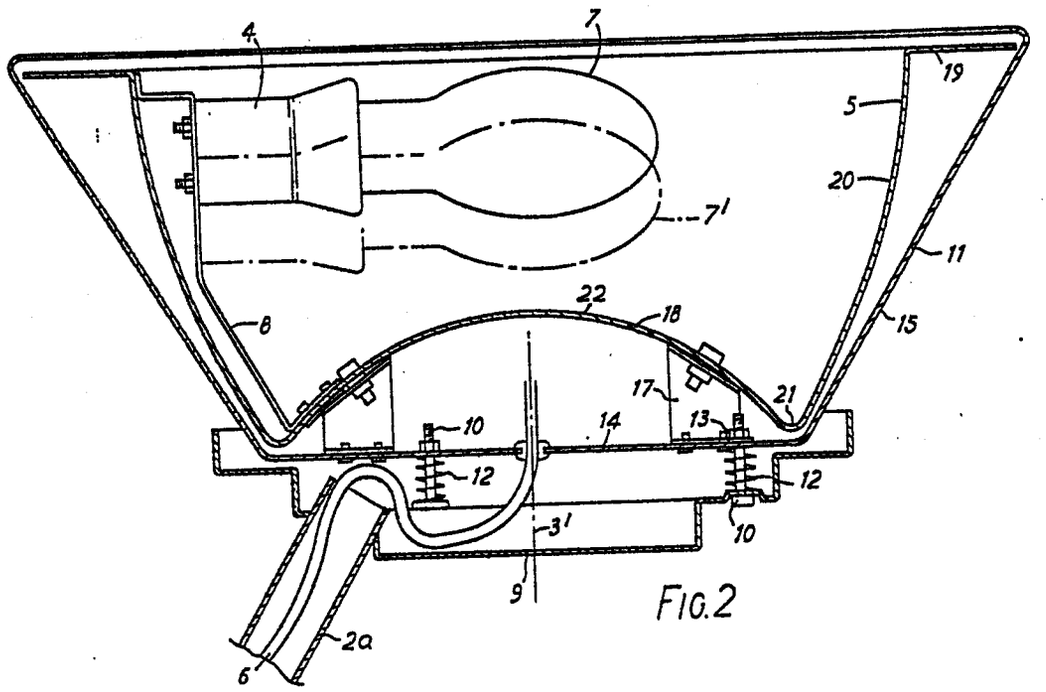

FIG. 2

"Uplighter"

This invention relates to an uplighter.

An uplighter is a light which is designed to throw light upwardly onto a ceiling to be reflected onto the area being illuminated. Uplighters, which have recently been developed, are intended to illuminate working areas where people require light for reading, writing and drawing, and must not be confused with various known devices for concealed lighting, such as may be used for example for background lighting in a home. An uplighter is typically designed, in cooperation with a suitable ceiling, to provide a high quality light with highly uniform distribution over a substantial area in which people work, for example 20 square meters per uplighter, and usually employs as its lamp a single high quality lamp of good colour rendering. Modern high pressure discharge lamps of the metal halide type (known as MBIF lamps e.g. a mercury halide lamp) provide light of suitable quality and have sufficient power. Such a lamp should be located so that it cannot normally be viewed directly by a person in the room, e.g. the lamp should not be visible unless a person's eye-level exceeds a minimum of 2 metres above the floor level.

An uplighter consists essentially of a lamp holder and associated reflecting surfaces which are intended to achieve a desired distribution of light on the ceiling above the uplighter. Uplighters may be used in multiple in a room, being spaced to achieve the desired illumination in combination. It must be borne in mind that by uniform distribution of light is meant uniform reflection of light from the ceiling, so that it is sought to have a high uniformity of intensity of light falling on the ceiling over as wide an area as possible. In practice, perfect uniformity is not achievable, and if uplighters are used in multiple, may not be desirable. In general, the spacing of the ceiling from the uplighter is critical. An uplighter generally includes a support for the lamp holder and the reflecting surfaces and may also include electrical equipment associated with the lamp. The most convenient form of support is a standard by which the uplighter is supported on the floor, since this achieves the desired regulation of the height of the lamp holder above the floor but alternatively an uplighter may be made integral with a piece of funiture, or may be adapted for clamping to a piece of furniture or merely standing on the furniture.

Hitherto, reflecting surfaces have been

provided around the lamp holder, partly in order to provide some distribution of the light from the lamp and partly to screen the lamp from the room in which the uplighter stands. The surface below the lamp has not received much attention; in fact in one marketed uplighter this base is partly covered by the electrical equipment associated with the lamp, e.g. the electrical ballast.

The present invention is intended to provide an improvement in the shape of the reflecting surfaces of an uplighter, with a view to improved light distribution.

According to the invention there is provided an uplighter having a lamp holder and a reflector which extends all around and below the location of the lamp held by the lamp holder in use of the device, so that in the intended orientation of the uplighter in use light from the lamp is distributed upwardly, the reflector having, as seen in vertical section, a side wall face which converges in the downward direction and extends all around the lamp location, an upwardly convex base wall face and an upwardly concave valley face which smoothly joins the lower edge of said side wall face to the periphery of the said base wall face.

Preferably also the side wall face as seen in vertical section is inwardly curving in the downward

direction, e.g. in the manner of a parabola or a part sphere, starting from the equatorial plane.

Preferably the upwardly convex base wall face occupies most, e.g. more than 80%, of the area bounded by the lower edge of the side wall face, while the upwardly concave valley face occupies the rest of this area. Thus the radius of curvature of the valley face, as seen in section, may be much smaller than that of the convex base wall face. Preferably the reflector is circular in plan being symmetrical about a central vertical axis.

Preferably the angle of the vertical of a line extending from a point at the top edge of the side wall face to the closest point of the bottom of the concave valley face is not more than 30°, e.g. lies in the range 15-25°.

The upwardly convex base wall face is preferably a part spherical surface, and its maximum height above the lower end of the reflector may be between 20 and 40% of the overall height of the reflector surfaces.

The reflector surfaces are conveniently provided by a reflector made in one piece of shaped sheeting, for example made of spun aluminium. This provides suitable strcutural strength for the reflector, which can also support the lamp holder.

Around the reflector there may be provided an exterior housing, the principle purpose of which is to give the uplighter an attractive exterior appearance and which can also support electrical devices associated with the lamp, e.g. in a space beneath the upwardly convex base wall of the reflector.

It is mentioned that US-A-4 242 725 shows parabolic-section reflectors for use with line-type light sources for exposure of photographic material located at the outlet plane of the reflector. It is stated that, to achieve uniform lighting at that plane, the bottom of the parabolic shape should be deformed upwardly towards the light source. This is a field unrelated to uplighters.

One embodiment of the invention will now be described by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a general view of the uplighter; and

Figure 2 is an axial vertical cross sectional view of the top portion of the uplighter of Fig. 1.

As shown by Fig. 1, the uplighter has a base 1 which carries an offset standard 2 which in turn carries the top portion 3. The top portion 3 is shown in Fig. 2 and contains the lamp holder 4 and the reflector 5. Electrical power is provided by a lead 6 (not shown in Fig. 1) which enters the base and passes up to the top portion within the standard 2. The circuitry and circuit components provided for the lamp 7 held by the lamp holder 4 are not shown in Fig. 2. The lamp 7 is a mercury halide lamp (e.g. of type MBI or MBIF) and may be for example 250 W or 400 W. The broken line position 7' of Fig. 2 shows an alternative location of the lamp 7 and the lamp holder 4 on the support 8 for the lamp holder.

Referring now to Fig. 2 in more detail, the upper end 2a of the standard 2 supports a stepped base plate 9, which via three levelling bolts 10 carries a housing 11. The levelling bolts, which are spaced at 120° around the axis 3' of the top portion 3 are surrounded by compression springs 12 and engage in nuts 13 secured on the housing 11. The housing 11 has a flat base 14 and a frusto-conical side wall 15 which at its upper end has a small inwardly curved lip 16 so that almost the whole of its top is open. The cone angle of the side wall 15 is 62°. The housing

11 may be made in one piece as an aluminium spinning.

The base 14 of the housing 11 carries three reflector support brackets 17 which are rivetted in place. Bolted onto the brackets 17 is the reflector 18, which is made in one piece, also as an aluminium spinning. The lamp support 8 previously mentioned is rivetted onto the reflector.

At its upper end the reflector 18 has an annular flange 19 from the inside edge of which the side wall 20 extends downwardly, being inwardly curved, as seen in section in Figure 2, so that it provides an inwardly converging reflection face around the lamp 7. The upper edge, this side wall 20 is above the top of the lamp 7. At its lower edge, the side wall 20 merges smoothly (i.e. via smooth uninterrupted curves) via an upwardly convex valley portion 21 into an upwardly concave or domed base portion 22 which is substantially continuous and uninterrupted. The whole reflector 18 is circularly symmetrical about the central vertical axis 3'. As Figure 2 shows, the side wall 20 has a radium of curvature greater than that of the base wall portion 22. Nevertheless the base wall portion 22 occupies more than 80% of the area enclosed by the bottom edge of the side wall 20. As a guide to dimensions, the diameter of the side wall portion 20 at its top

edge is 450 mm. The top of the base wall portion 22 is at about 30% of the overall height of the side wall 20. Thus there is coinciderable space beneath the dome for electrical circuitry and devices associated with the lamp 7. The angle, to the vertical, from a point on the upper edge of the side wall 20 to the closest point of the bottom of the valley portion 21 is about 20°.

No coating of the spum aluminium reflector 18 is necessary, but if desired a polished reflecting surface can be provided, or alternatively a matt white surface can be provided.

It has been found that the configuration of the reflector 18 of Figure 2 is particularly favourable from the point of view of good distribution of the light upwardly, for use as an uplighter, with the ceiling spaced at preferably 110 cm from the top of the uplighter. It seems that combination of the upwardly convex dome 22 and the upwardly concave valley region 21 plays a significant role in achieving the desired distribution of light.

The light emitted downwardly by the lamp 7 tends to be thrown outwardly as well as upwardly by the dome 22, partly out of the reflector and partly out against the side wall 20 for further reflection. The smoothly curved valley 21 causes further reflection and tends to avoid unevenness of light

reflection by the reflector. The reflector is open at the top to allow light emitted upwardly by the lamp to pass directly out of the uplighter.

In the illustrated embodiment, the radius of curvature of the sidewall 20 as seen in Fig. 2 is 490 mm, that of the valley 21 is 10 mm and that of the domed base 22 is 185 mm.

CLAIMS.

1. An uplighter having a lamp holder (4) and a reflector (18) which extends at around and below the location of the lamp (7) held by the lamp holder (4) in use of the device, so that in the intended orientation of the uplighter in use light from the lamp is distributed upwardly, characterized in that the reflector has, as seen in vertical section, a side wall face (20) which converges in the downward direction and extends all around the lamp location, an upwardly convex base wall face (22) and an upwardly concave valley face (21) which smoothly joins the lower edge of said side wall face (20) to the periphery of the said base wall face (22).

2. An uplighter according to claim 1 wherein the side wall face (20) is inwardly curving in the downward direction as seen in section.

3. An uplighter according to claim 1 or 2 wherein the upwardly convex base wall face (22) occupies most of the area bounded by the lower edge of the side wall face (20), while the upwardly concave valley face (21) occupies the rest of this area.

4. An uplighter according to any one of claims 1 to 3 the reflector is circular in plan being symmetrical about a central vertical axis (3').

5. An uplighter according to any one of claims 1 to 4 wherein the upwardly convex base wall face (22) is a part spherical surface, and its maximum height above the lower end of the reflector is between 20 and 40% of the overall height of the reflector surfaces.

6. An uplighter according to any one of claims 1 to 5 wherein the reflector surfaces are provided by a reflector made in one piece of shaped metal.

7. An uplighter according to any one of claims 1 to 6 wherein the angle to the vertical of a line from a point at the top edge of the side wall face to the closest point of the bottom of the concave valley face is less than 30°.

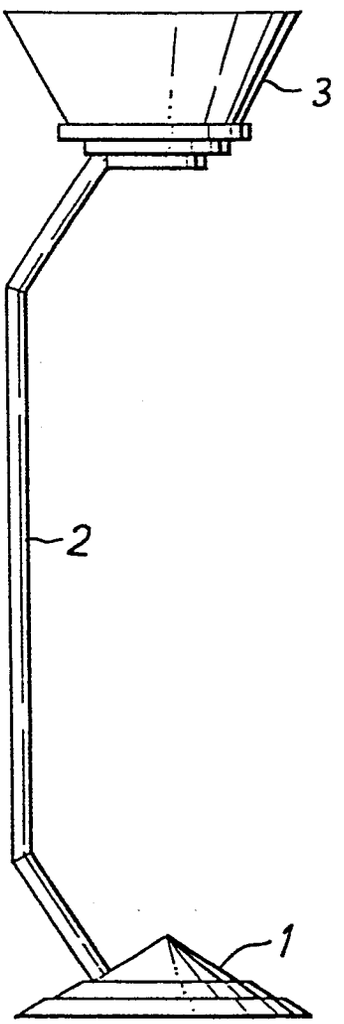

FIG.1

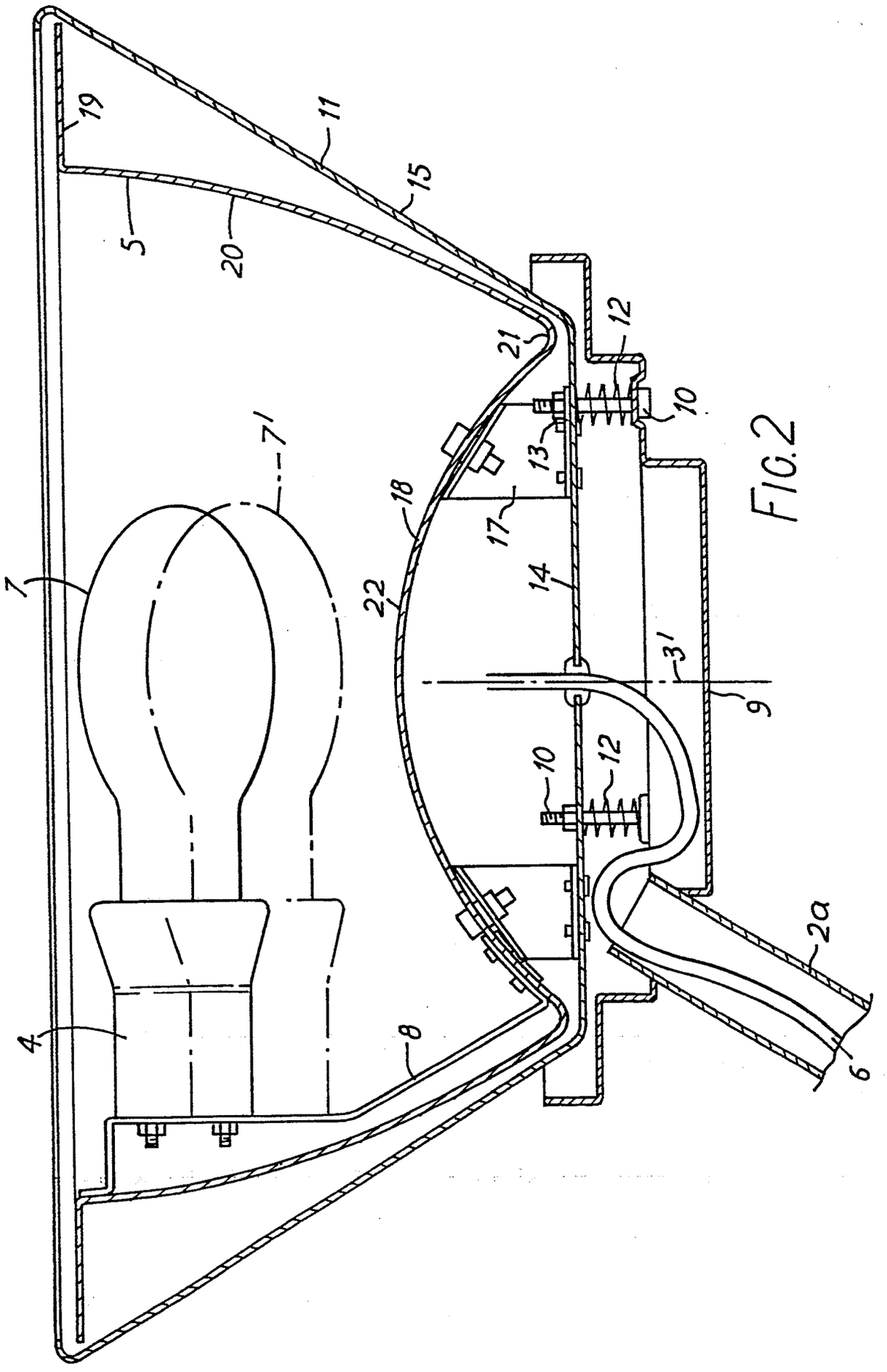

FIG.2

European Patent Office

EUROPEAN SEARCH REPORT

0137654
Application number

EP 84 30 5563

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.4)
X	US-A-4 386 392 (REIBLING) * Figures 2-3 *	1-4,6,7	F 21 V 7/00
A	US-A-1 950 130 (BARLOW) * Figure 9 *	5	
D,A	US-A-4 242 725 (DOUMA) * Figure 5 *	5	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

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	20-11-1984	FOUCRAY R.B.F.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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