

*Sign carrier for an emergency light***Field of the Invention**

The present invention relates to the provision of emergency lighting and signage in buildings and in particular the invention provides an improvement to
5 low cost emergency lights to incorporate an emergency sign which is illuminated under emergency conditions.

Background to the Invention

Prior art illuminated emergency signs take a number of forms. These include streamlined designs centering on thin, edge lit, sign carrying blades, incorporating a light transmitting core extending from a lamp housing
10 containing a fluorescent tube adjacent an edge of the blade as well as batteries, inverter and control circuits. At the other end of the scale, less expensive but bulkier rear illuminated signs are commonly found to be in use, in which the sign housing includes space behind a single sign panel or between bi-directional signs
15 in which one or more fluorescent lamps are located

The known configurations are generally relatively expensive, bulky and generally only provide an emergency sign with little or no emergency lighting function.

Prior art emergency lights known as satellites, on the other hand are
20 relatively low cost and light, comprising a quartz-halogen bulb mounted in a relatively small low profile base having simple spring mount to hold the fitting in an appropriately sized hole in the ceiling. The Satellite fitting typically has an associated electronics and battery unit located in close proximity in the ceiling to detect power failures, to operate the lamp under emergency conditions and to
25 maintain battery charge in non-emergency conditions. Satellite fittings, however, have not previously been associated with emergency signage.

Within the context of this specification, references to even distribution of light are intended to be read as meaning sufficiently even distribution to meet the relevant standard applicable to the device or the particular feature of the
30 device (eg, standards relating to even illumination of emergency signs or even distribution of light emitted from an emergency light).

Summary of the Invention

According to a first aspect the present invention consists in a sign carrying element for an illuminated sign, the sign carrying element including
35 connection means for connecting the sign carrying element to a cooperating base of an emergency light, the sign carrying element having a light receiving surface

and internal light transmission means arranged to distribute light entering through the light receiving surface and to evenly project the light through a sign carrying surface of the sign carrying element, the sign carrying element connection means located adjacent to one edge of the sign carrying element to
5 engage with a cooperating portion of the base when the sign carrying element is connected to the base, and the light receiving surface being located adjacent to a lamp of the emergency light when the sign carrying element is connected to the base, such that when the emergency light is illuminated an emergency sign mounted over the sign carrying surface is illuminated by light projected through
10 he light receiving surface from the emergency light.

According to a second aspect the present invention consists in an emergency light and sign carrying element for an illuminated sign, the sign carrying element projecting from a base of the emergency light, the sign carrying element having a light receiving surface and internal light transmission
15 means arranged to distribute light entering through the light receiving surface and to evenly project the light through a sign carrying surface of the sign carrying element, and the light receiving surface being located adjacent to a lamp of the emergency light, such that when the emergency light is illuminated an emergency sign mounted over the sign carrying surface is illuminated by
20 light projected through he light receiving surface from the emergency light.

Embodiments of the present invention, provide an emergency sign which is illuminated in emergency conditions by the emergency light without significantly degrading the projected light output of the emergency light, the illumination through sign carrying surfaces of the sign being relatively evenly
25 distributed (with reference to the requirements of national and international product standards).

In the preferred embodiment the emergency lamp is a "satellite" lamp comprising a quartz-halogen bulb mounted in a co-operating base. Preferably the base is a low profile, light weight unit which mounts by clipping through a
30 hole in the ceiling and the electronics to monitor supply interruptions and to operate the lamp in emergency conditions is mounted in a separate housing located in the ceiling.

The sign carrying element also preferably includes an internal lamp or lamps which indicate the current operational status of the light when the
35 emergency light is not operating.

The sign carrying element can take a number of forms including elements having opaque external structures, with light conducting members mounted in the structure, or alternatively, the body of the element can be transparent or translucent with the light conducting elements integrally formed and with
5 masking and/or diffusing material applied in appropriate regions.

Preferably, the sign carrying element is formed as a pair of half shells, moulded in transparent or translucent plastics material, such as acrylic or polycarbonate.

In the case of an opaque body, the light transmitting region can be simply
10 an opening or may incorporate a lens or diffuser.

Brief Description of the Drawings

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

Figure 1 is a bottom view of an emergency light and sign assembly
15 according to the present invention;

Figure 2 is a front view (partially in section) of the sign body of the assembly of Figure 1;

Figure 3 is a sectional end view the sign body of the assembly of Figure 1;

Figure 4 is a front view of one half of the sign body of Figure 3; and

20 Figure 5 is a sectional side view of the emergency light and sign assembly of Figure 1 showing the mounting arrangement on a ceiling.

Detailed Description of the Preferred Embodiment

Referring to Figure 1 of the accompanying drawings, a bottom view of an emergency light and sign assembly, according to an embodiment of the
25 invention is illustrated. In this embodiment a base unit 11 is arranged to be mounted to a ceiling 33 (refer to Figure 5).

The base 11 carries a test switch and indicator panel 15 for initiating a manual test of the emergency light and indicating the status of various components of the emergency lighting system (communications, battery power
30 etc). The sign body 12 clips onto the base as best seen in Figure 2.

The remaining features of the base are best viewed from figure 2, which shows the profile of the base and sign when viewed from the front. The base 11 has an essentially convex shape when viewed from below, with a concave reflector region 19 around the bulb 13 and bulb receptacle 32. Electrical
35 connection to the bulb 13 is via a cable 34 which enters the top of the receptacle

32. Slots 14 are provided in the concave reflector region 19 to permit airflow over the bulb 13.

The sign body 12 comprises a clipping portion 35 which clips over the peripheral edge of the light base 11, making use of the resilient properties of the sign body material, and the sign blade 37 which, when mounted to the base, projects below the bulb 13. The sign body 12 is formed as two moulded shell halves which are held together by clips 36 located about the periphery of the sign body.

Sign carrying surfaces 31 of the sign body 12 may either carry a sign image screen printed onto the surface, or alternatively, a translucent film carrying the sign image (also not shown) may be inserted behind tabs 21. Sign images may be located on one or both surfaces of the blade 37.

Light assemblies 23 are located in cavities 41 extending to the outer edges towards the upper extremity of the blade 37. The indicator assembly 23 includes connector posts 24 projecting through the upper edge of the sign carrier and through holes in the base 11 where a driving circuit (not shown) is connected to the posts 24. In the illustrated embodiment, the indicator light assemblies 23 comprise a number of series connected LEDs which may be driven in a conventional manner via a current limited source. The intended use of the LED assemblies 23 is to illuminate the sign carrier under normal circumstance where power is present and the emergency light is therefore, not energised.

The removable sign body 12 of the preferred embodiment is preferably formed in a transparent, semi-transparent or translucent high impact plastics material such as acrylic or poly carbonate and is moulded as a pair of shell halves which are clipped together by cooperating clip elements 36 around the periphery of each shell half

When the emergency light is illuminated, indicating loss of normal power in an emergency situation, some of the light from the source 13 is radiated towards the light receiving surface 42 such that light enters the blade portion 37 of the sign body 12. Referring to Figure 3, once light has entered the surface 42 it passes into one or other of two light conducting elements which together from the blade 37.

The internal surfaces 27 of the light conducting elements face a tapered cavity 26, and are provided with corrugations ripples 22 to assist in creating

multiple internal reflection modes and to cause some light to break out of the light pipe.

The light projected into the two halves of the body of the sign carrying element 12, which act as light pipes, exhibits multiple internal reflection modes within the respective element half. In one of the possible reflection modes, light travels from the light entry point along each of the halves of the sign body and is subsequently refracted and reflected out of the respective body half. The light emerging from the sign carrying outer surfaces 31 of the body halves back illuminates the signs carried on the sign carrying surfaces, while the light emerging from the inner surfaces 27 of the body halves travels across the cavity 26 and through the opposite walls 31 of the sign carrying element 12 to back illuminate the signs carried over the opposite outer surfaces of the sign carrying element. Again, light is refracted and/or reflected towards the respective sign carrying surfaces 33 by virtue of the corrugations 22 on the inner surfaces 27.

Other possible internal reflection modes involve light undergoing multiple internal reflections within one of the body halves before emerging from one of the surfaces 31.

An important feature of the sign carrier 12 is that it has only a small impact on the normal operation of the emergency lamp. The domed portion 43 of the sign body acts as a transparent or translucent cover/diffuser for the lamp 13 such that the coverage of the lamp is substantially the same, if not better than when the sign body 12 is not fitted. The bulb 13 is not significantly obscured by the blade 37 as most of the light from the bulb 13 travels outside the blade past each face 31, with the only significant obstruction being in the plane of the blade 37 itself. However, some of the light coupled into the blade through surface 42 passes right through the blade and out of its edges such that the shading effect of the blade on the emergency lighting function is not a significant issue and is addressed where necessary, by a small reduction in the rating of the lighting capacity of the fitting.

The sign carrier body 12 may be readily unclipped from the base 11 for replacement of the bulbs 13.

Referring to figure 5, the base 11 of the emergency light is mounted to a ceiling 33, over an opening 20 in the ceiling 33 and is retained in position by a resilient member 29. During installation, the resilient member 29 can be sprung in, to pass through the opening 20, and when released, it will spring back towards its rest position such that it engages the upper edge of the opening 20

to hold the base 11 against the ceiling 33. The resilient member 29 extends from a collar 30 which clips into the base 11.

5 It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A sign carrying element for an illuminated sign, the sign carrying element including connection means for connecting the sign carrying element to a cooperating base of an emergency light of a type that is used as an emergency light without a sign carrying element, the sign carrying element having a light receiving surface and internal light transmission means arranged to distribute light entering through the light receiving surface and to evenly project the light through a sign carrying surface of the sign carrying element, the sign carrying element connection means located adjacent to one edge of the sign carrying element to engage with a cooperating portion of the base when the sign carrying element is connected to the base, and the light receiving surface being located adjacent to a lamp of the emergency light when the sign carrying element is connected to the base, such that when the emergency light is illuminated, an emergency sign mounted over the sign carrying surface is illuminated by light projected through the light receiving surface from the emergency light and reflected through the emergency sign and the lighting capacity of the emergency light with the sign carrying element fitted, is not significantly reduced with respect to the illumination coverage of the emergency light when the sign carrying element is not fitted.
2. The sign carrying element as claimed in claim 1, wherein the sign carrying element comprises a transparent or translucent body with light conducting elements integrally formed therein.
3. The sign carrying element as claimed in claim 2, wherein diffusing material is applied to regions of the body to improve the even distribution of light from the sign carrying surfaces.
4. The sign carrying element as claimed in claim 2, or 3 wherein masking material is applied to regions of the body where light emission is not required.
5. The sign carrying element as claimed in any one of claims 2 to 4, wherein the body comprises a pair of half shells, moulded in transparent or translucent plastics material.
6. The sign carrying element as claimed in claim 5, wherein the body is moulded in acrylic material.
7. The sign carrying element as claimed in claim 5, wherein the body is moulded in poly carbonate material.
8. The sign carrying element as claimed in any one of claims 2 to 4, wherein the sign carrying element comprises an opaque external structure with

apertures where the sign carrying surfaces are located, with light transmitting regions are located in the structure to direct light from the light receiving surface to the sign carrying surface.

9. The sign carrying element as claimed in any one of claims 2 to 8, wherein
5 the light transmission means comprises a light transmitting core.

10. The sign carrying element as claimed in any one of claims 2 to 9, wherein the light transmission means comprises an open space.

11. The sign carrying element as claimed in any one of claims 2 to 10, wherein the light transmission means comprises a lens

10 12. The sign carrying element as claimed in any one of claims 2 to 11, wherein the light transmission means comprises a diffuser.

13. The sign carrying element as claimed in any one of the preceding of claims, wherein the sign carrying element includes an internal lamp or lamps which indicate a current operational status of the light when the emergency
15 light is not illuminated.

14. The sign carrying element as claimed in any one of the preceding of claims, wherein the configuration of the sign carrying element enables illumination of the emergency sign by the emergency light in emergency conditions without significantly degrading the projected light output of the
20 emergency light.

15. The sign carrying element as claimed in any one of the preceding of claims, wherein the illumination through the sign carrying surfaces of the sign is relatively evenly distributed (as hereinbefore defined).

16. The sign carrying element as claimed in any one of the preceding claims
25 wherein, the sign carrying element cooperates with the base of a ceiling mountable emergency light whereby in use the sign carrying element projects vertically downwardly from the base with the sign carrying surface in a substantially vertical plane, the light receiving surface of the sign carrying element being located along an edge of the sign carrying element which is an
30 upper surface when the sign carrying element is in use.

17. An emergency light and sign carrying element for an illuminated sign, the sign carrying element projecting from a base of the emergency light, and the emergency light being of a type that is used as an emergency light without a sign carrying element the sign carrying element having a light receiving surface
35 and internal light transmission means arranged to distribute light entering through the light receiving surface and to evenly project the light through a sign

carrying surface of the sign carrying element, and the light receiving surface being located adjacent to a lamp of the emergency light, such that when the emergency light is illuminated, an emergency sign mounted over the sign carrying surface is illuminated by light projected through the light receiving surface from the emergency light and reflected through the emergency sign and the lighting capacity of the emergency light with the sign carrying element fitted is not significantly reduced with respect to the illumination coverage of the emergency light when the sign carrying element is not fitted.

18. The emergency light and sign carrying element as claimed in claim 17, wherein the sign carrying element comprises a transparent or translucent body with light conducting elements integrally formed therein.

19. The emergency light and sign carrying element as claimed in claim 18, wherein diffusing material is applied to regions of the body to improve the even distribution of light from the sign carrying surfaces.

20. The emergency light and sign carrying element as claimed in claim 18, or 18, wherein masking material is applied to regions of the body where light emission is not required.

21. The emergency light and sign carrying element as claimed in any one of claims 18 to 20, wherein the body comprises a pair of half shells, moulded in transparent or translucent plastics material.

22. The emergency light and sign carrying element as claimed in claim 21, wherein the body is moulded in acrylic material.

23. The emergency light and sign carrying element as claimed in claim 21, wherein the body is moulded in poly carbonate material.

24. The emergency light and sign carrying element as claimed in any one of claims 18 to 20, wherein the sign carrying element comprises an opaque external structure with apertures where the sign carrying surfaces are located, with light transmitting regions are located in the structure to direct light from the light receiving surface to the sign carrying surface.

25. The emergency light and sign carrying element as claimed in any one of claims 18 to 24, wherein the light transmission means comprises a light transmitting core.

26. The emergency light and sign carrying element as claimed in any one of claims 18 to 25, wherein the light transmission means comprises an open space.

27. The emergency light and sign carrying element as claimed in any one of claims 18 to 26, wherein the light transmission means comprises a lens

11.4 SEP 2004

28. The emergency light and sign carrying element as claimed in any one of claims 18 to 27, wherein the light transmission means comprises a diffuser.
29. The emergency light and sign carrying element as claimed in any one of claims 17 to 28, wherein the sign carrying element includes an internal lamp or
5 lamps which indicate a current operational status of the light when the emergency light is not illuminated.
30. The emergency light and sign carrying element as claimed in any one of claims 17 to 29, wherein the configuration of the sign carrying element enables illumination of the emergency sign by the emergency light in emergency
10 conditions without significantly degrading the projected light output of the emergency light.
31. The emergency light and sign carrying element as claimed in any one of claims 17 to 30, wherein the illumination through the sign carrying surfaces of the sign is relatively evenly distributed (as hereinbefore defined).
- 15 32. The emergency light and sign carrying element as claimed in any one of claims 17 to 31, wherein the emergency lamp is a "satellite" lamp comprising a quartz-halogen bulb mounted in a cooperating base.
33. The emergency light and sign carrying element as claimed in any one of claims 17 to 32, wherein the base is a low profile, light weight unit.
- 20 34. The emergency light and sign carrying element as claimed in any one of claims 17 to 33, wherein the base of the lamp is mounted by clipping through a hole in a ceiling.
35. The emergency light and sign carrying element as claimed in any one of claims 17 to 34, wherein the emergency lamp includes electronics to monitor
25 supply interruptions and to operate the lamp in emergency conditions the electronics being mounted in a separate housing located above the ceiling.
36. The emergency light and sign carrying element as claimed in any one of claims 17 to 35 wherein, the sign carrying element cooperates with the base of a ceiling mountable emergency light whereby in use the sign carrying element
30 projects vertically downwardly from the base with the sign carrying surface in a substantially vertical plane, the light receiving surface of the sign carrying element being located along an edge of the sign carrying element which is an upper surface when the sign carrying element is in use.
37. A sign carrying element substantially as hereinbefore described with
35 reference to the accompanying drawings.

14 SEP 2004

38. The emergency light and sign carrying element substantially as hereinbefore described with reference to the accompanying drawings.