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(54) **LIGHTING PANEL ASSEMBLY**

(57) A lighting panel assembly comprising an LED flat lighting panel having a back support panel (4), a front illuminating panel (6), and side panels (8) thereinbetween, and having a plurality of LEDs therein to provide illumination through the front illuminating panel (6), and further comprising an emergency lighting pod (20) conjoined to the back support panel (4), and an aperture (10)

in the back support panel (4) to allow illumination from the emergency lighting pod (20) through the front illuminating panel (6) in an emergency.

In this way, emergency lighting can be provided with the LED flat lighting panel, and can provide emergency lighting from the flat lighting panel in the event of an emergency.

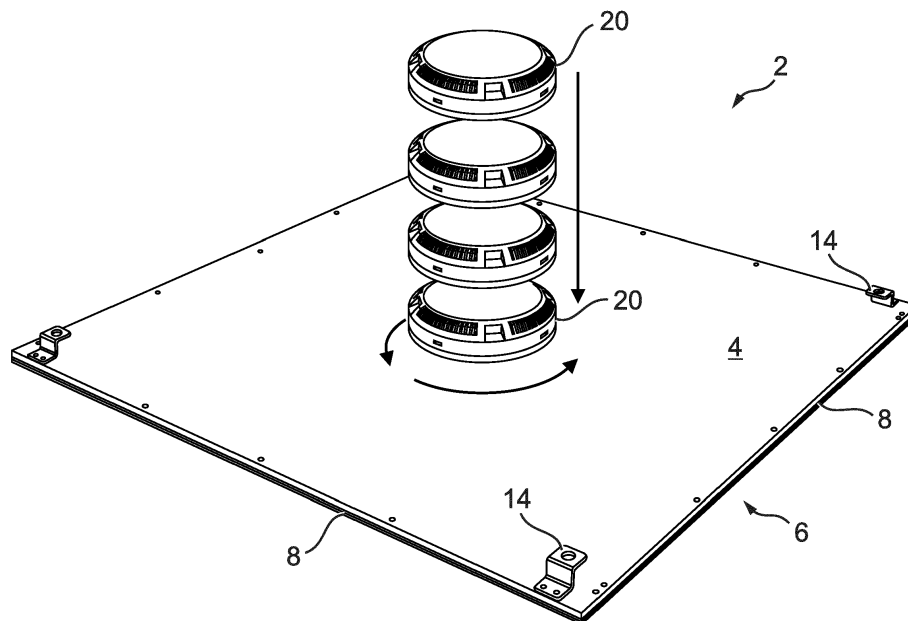


Fig. 1

Description

[0001] The present invention relates to a lighting panel assembly comprising an LED flat lighting panel.

[0002] With an increasing focus on energy and cost savings, the use of Light Emitting Diodes (LEDs) is becoming a popular choice of light source. In this regard, high performance LED flat panels are now increasingly used in large or commercial or business premises. These can be provided in various dimensions, a typical set of dimensions being 600mm by 600mm by 13mm, for use in ceilings. They provide low glare and even light distribution, as well as substantial average lifetime. In particular, they can be provided as 'flat panels', i.e. able to be incorporated into part of a ceiling panel system or arrangement generally formed of regular squares etc. As such, they can very easily shaped and recessed into a suitable position within the panel system or arrangement.

[0003] Meanwhile, there is significant legislation requiring the provision of 'emergency lighting' in buildings, particularly offices, shops, public places and commercial premises. There is now a UK standard for emergency lighting under BS5266-1. The British and European standard BS EN 1838 goes further, in defining emergency lighting into two main types; emergency escape lighting and standby lighting.

[0004] Every building has its own specific requirements in terms of lighting, and therefore its own specific requirements in respect of emergency escape illumination to take over from the normal lighting provision in the event of a power failure or circuit failure. Currently, this is commonly provided separately from the normal lighting, with attendant CAPEX and OPEX cost. There is an increasing need to more easily and more cost effectively provide emergency lighting that meets the required standards.

[0005] According to one aspect of the present invention, there is provided a lighting panel assembly comprising an LED flat lighting panel having a back support panel, a front illuminating panel, and side panels therebetween, and having a plurality of LEDs therein to provide illumination through the front illuminating panel, and further comprising an emergency lighting pod conjoined to the back support panel, and an aperture in the back support panel to allow illumination from the emergency lighting pod through the front illuminating panel in an emergency.

[0006] In this way, emergency lighting can be provided with the LED flat lighting panel, and can provide emergency lighting from the flat lighting panel in the event of an emergency.

[0007] As mentioned above, LED flat lighting panels are known in the art. The present invention is not limited by the nature, design, size or shape of the flat lighting panel. They can be square, rectangular or otherwise shaped. A typical 'size' dimension for a flat lighting panel is 600mm by 600mm, in line with commonly used dimensions in ceiling square system or arrangement.

[0008] The LED flat lighting panel in the present invention also has a height or depth which is not limiting, but which is typically several millimetres so as to provide a 'flat panel' shape in relation to the dimensions of the back support panel and front illuminating panel.

[0009] Some of the dimensions of the back support panel, front illuminating panel and sides are related to the type, size and design of the LED to be housed therein. Typically, LEDs can provide power ratings of 10-100 watts, such as 35W or 45W. The arrangement and powering of the LEDs is not further described herein, and is known to the person skilled in the art.

[0010] The present invention further comprises an emergency lighting pod. The pod may have any suitable size, shape, design and dimensions. Preferably, the width of the emergency lighting pod is substantially smaller relative to the 'size' dimensions of the back support panel.

[0011] The emergency lighting pod may be conjoined to the back support panel to form the lighting panel assembly using any suitable conjoining system or arrangement. This can include any form of male-female interaction. Preferably, the conjoining achieves securing of the emergency lighting pod to the back support panel.

[0012] Optionally, the emergency lighting pod is conjoined to the back support panel via the aperture in the back support panel.

[0013] Where the lighting panel assembly is in an expected non-contact location, such as in a ceiling, the conjoining of the emergency lighting pod to the back support panel may not require locking or another form of conjoining which must be robust against any 'every day' contact.

[0014] Preferably, the emergency lighting pod is conjoined with the back support panel using an 'insert and twist' arrangement or conjunction system. Optionally this is tightened and/or secured by friction only.

[0015] Optionally, the emergency lighting pod comprises at least one tongue, and the aperture in the back support panel comprises at least one complementary cutaway.

[0016] Further optionally, the emergency lighting pod comprises two or more, typically two, three or four, tongues extending from a lower part or base of the emergency lighting pod, and there are a complimentary number of cutaways around the aperture in the back support panel to accept the tongue(s), followed by a twisting motion of the emergency lighting pod relative to the back support panel to move the tongue(s) into a position on one side of the back support panel opposite to the remainder of the emergency lighting pod on the other side of the back support panel.

[0017] The emergency lighting pod may comprise one or more lights or lighting means known in the art, including LEDs, able to provide sufficient illumination to qualify as emergency lighting in relation to the above defined standards.

[0018] Preferably, the emergency lighting is provided through an aperture in the back support panel, optionally

the same aperture used to conjoin the emergency lighting pod with the flat lighting panel.

[0019] Emergency lighting can be defined as 'maintained', i.e. on all the time, or 'non-maintained', i.e. only operating when the normal lighting fails. Emergency systems or individual lighting units can be designed to operate for durations of between 1 and 3 hours after a main power supply fails, and in practice, the 3-hour design is the most popular. Some emergency lighting can be available as switchable units between maintained and non-maintained modes of operation where desired or useful.

[0020] Power for emergency lighting can be maintained through a central power source or a self contained power source. Supplying power to the emergency lighting pod can be provided in a manner known in the art, is not further discussed here.

[0021] Optionally, the emergency lighting pod is provided as a separate unit, to be fitted to an LED flat lighting panel as described above. Thus, the emergency lighting pod can be separable from the back support panel.

[0022] Thus, according to another aspect of the present invention, there is provided a kit comprising an LED flat lighting panel as defined herein and an emergency lighting pod as defined herein.

[0023] Optionally, the lighting panel assembly defined herein is a ceiling lighting panel.

[0024] As the emergency lighting pod can be provided as a separate unit, it can also be retro-fitted to existing LED flat lighting panels, generally being the same or similar to as described herein. Optionally, the back support panel of existing LED flat lighting panels is adapted or changed to be conjoinable to the emergency lighting pod.

[0025] Thus, according to another aspect of the present invention, there is provided an emergency lighting pod adapted to conjoin with an LED flat lighting panel having a back support panel, the back support panel having an aperture, the emergency lighting pod comprising at least one tongue to match at least one complementary cutaway in the aperture of the back support panel, and to conjoin to the back support panel via an insert and twist arrangement.

[0026] And, according to another aspect of the present invention, there is provided an LED flat lighting panel having a back support panel comprising an aperture having at least one cutaway adapted to accept and conjoin with an emergency lighting pod as defined herein via an insert and twist arrangement.

[0027] The emergency lighting pod generally comprises at least one tongue to match with one or more cutaways in the aperture of the back support panel.

[0028] Optionally, the LED flat lighting panel is a ceiling lighting panel. LED flat lighting panels in general are known in the art. They generally comprise a back support panel, a front illuminating panel, and side panels therebetween, and have a plurality of LEDs therein to provide illumination through the front illuminating panel. In the present invention, the back support further comprises an aperture, generally in the form of circle with a non-con-

stant radius, to allow the attachment of an emergency lighting pod thereto, and to allow illumination from the emergency lighting pod through the front illuminating panel in an emergency.

[0029] The LED flat lighting panel is not limited by the nature, design, size or shape of the flat lighting panel. They can be square, rectangular or otherwise shaped. A typical 'size' dimension for a flat lighting panel is 600mm by 600mm, in line with commonly used dimensions in ceiling square system or arrangement. The aperture in the back panel may be in the form of a circular aperture with one, preferably at least two, intermittent circumferential tongues or shoulders or flanges to act as cutaways. Embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings in which:

Figure 1 is a perspective view of an lighting panel assembly according to one embodiment of the present invention; and

Figure 2 is a planned view of the back support panel of the flat lighting panel of Figure 1, and plan and side cross-section views of the base of the emergency lighting pod.

[0030] Referring to the drawings, Figure 1 shows an lighting panel assembly comprising an LED flat lighting panel 2 having a back support panel 4, a front illuminating panel 6 (under the back support panel 4) and four sides 8 thereinbetween.

[0031] Within the flat lighting panel 2 are a plurality of LEDs (not shown) able to provide illumination through the front illuminating panel 6 in a manner known in the art. A power supply (not shown) supplies power to the LEDs in a manner known in the art.

[0032] The back support panel 4 also comprises four attachment fixings 14 for securing the flat lighting panel 2 to a suitable support structure, generally in a ceiling system or arrangement comprising a number of square panels with supporting cross pieces in a manner known in the art.

[0033] Figure 2 shows an aperture 10 located in the centre of the back support panel 4, comprising a generally circular shape and having two cutaways 12.

[0034] Figures 1 and 2 show an emergency lighting pod 20 being generally circular, and housing one or more emergency lights or lighting providers 18 in a manner known in the art. Power to or for the emergency lighting pod is also not shown.

[0035] The base 21 of the emergency lighting pod 20 shown in Figure 2 comprises two tongues 22 extending transversely from a depending hollow sleeve 24, and having a shape complementary to the cutaways 12.

[0036] In use, the installer of the flat lighting panel 2 can conjoin the emergency lighting pod 20 in a manner shown in Figure 1, by location of the base 21 of the emergency lighting pod 20 onto the back support panel 4 such

that the hollow sleeve 24 and tongues 22 extend through the aperture 10. Thereafter, the emergency lighting pod 20 can be twisted a defined amount such that the tongues 22 are now located in line with the cutaways 12 and on an opposite side of the back support panel 4 compared with the remainder of the emergency lighting pod 20.

[0037] Should there be any failure or disruption to the illumination provided by the flat lighting panel 2 through the plurality of the LEDs therein, emergency lighting can be provided from the emergency lighting pod 20 through the hollow sleeve 24 and aperture 10 in or for an emergency.

Claims

1. A lighting panel assembly comprising an LED flat lighting panel having a back support panel, a front illuminating panel, and side panels thereinbetween, and having a plurality of LEDs therein to provide illumination through the front illuminating panel, and further comprising an emergency lighting pod conjoined to the back support panel, and an aperture in the back support panel to allow illumination from the emergency lighting pod through the front illuminating panel in an emergency. 20
2. A lighting panel assembly as claimed in claim 1 wherein the emergency lighting pod is conjoined to the back support panel via the aperture in the back support panel. 30
3. A lighting panel assembly as claimed in claim 2 wherein the emergency lighting pod comprises at least one tongue, and the aperture in the back support panel comprises at least one complementary cutaway. 35
4. A lighting panel assembly as claimed in claim 1 wherein the emergency lighting pod is conjoined to the back support panel via an insert and twist arrangement. 40
5. A lighting panel assembly as claimed in any one of the preceding claims wherein the back support panel and front illumination panel have the dimensions 600mm by 600mm. 45
6. A lighting panel assembly as claimed in any one of the preceding claims being a ceiling lighting panel. 50
7. A lighting panel assembly as claimed in any one of the preceding claims wherein the emergency lighting pod is separable from the back support panel. 55
8. A kit comprising an LED flat lighting panel as defined in any one of the preceding claims and an emergency lighting pod as defined in any one of the preceding

claims.

9. An emergency lighting pod adapted to conjoin with an LED flat lighting panel having a back support panel, the back support panel having an aperture, the emergency lighting pod comprising at least one tongue to match at least one complementary cutaway in the aperture of the back support panel, and adapted to conjoin to the back support panel via an insert and twist arrangement. 5
10. An LED flat lighting panel having a back support panel comprising an aperture having at least one cutaway adapted to accept and conjoin with an emergency lighting pod as defined in claim 9 via an insert and twist arrangement. 10
11. An LED flat lighting panel as claimed in claim 10 being a ceiling lighting panel, and wherein the back support comprises an aperture in the form of circle with a non-constant radius. 15

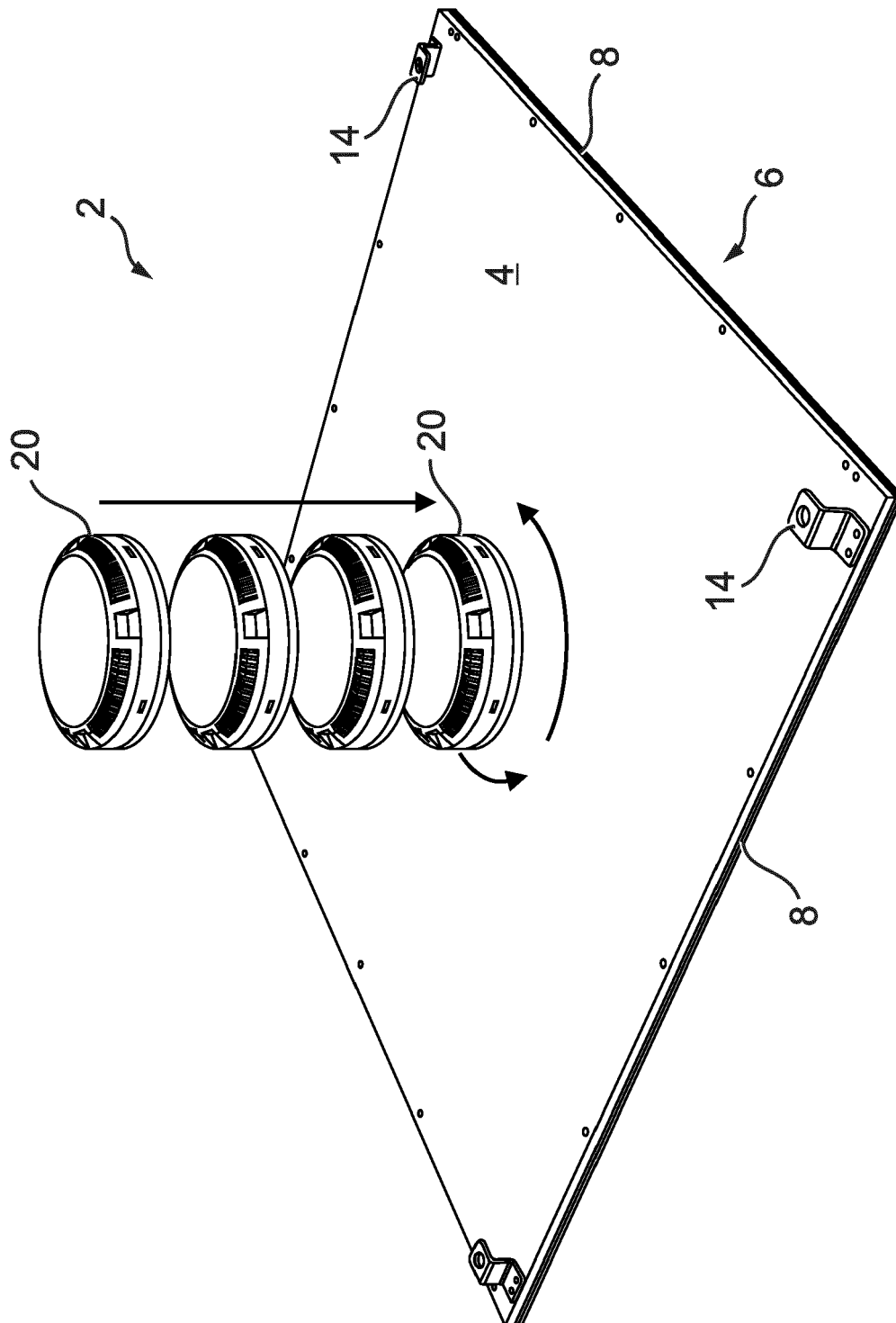


Fig. 1

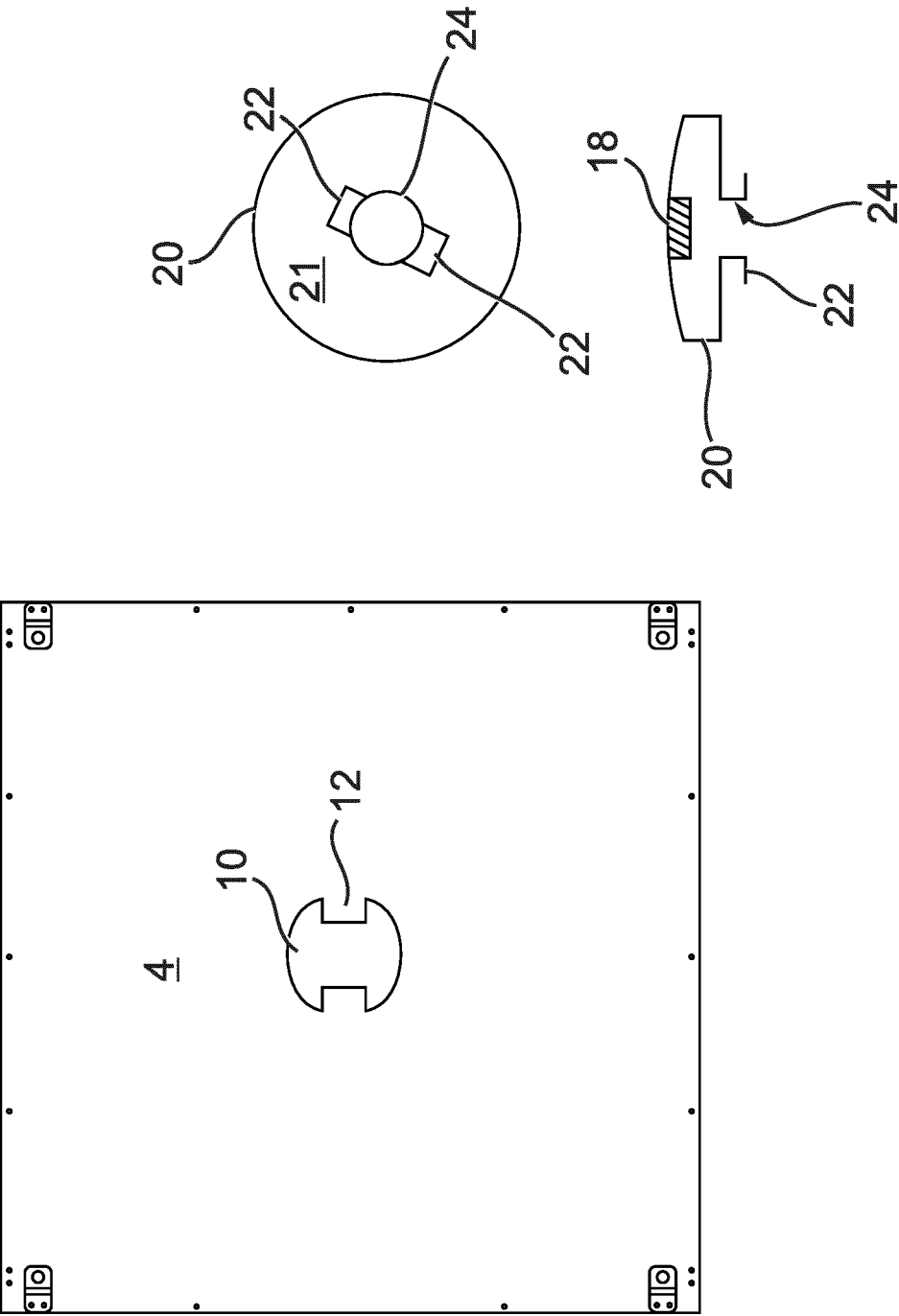


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 15 16 5652

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