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(54)

HOUSING FOR LUMINAIRE

(57)

A housing (110) for a luminaire (100, 200, 300, 400), adapted to hold a printed circuit board (130, 230, 330) comprising a driver (233) and at least one LED (232), the housing comprising:

a light exit window (111);

a first mounting element (210) configured to allow the printed circuit board to be mounted thereon; and

a second, different mounting element (112) on an

inner side wall (115B) of the housing, configured to allow the printed circuit board to be mounted thereon,

wherein the second mounting element is more proximate to the light exit window than the first mounting element, to thereby enable the printed circuit board to be mounted at different heights with respect to the light exit window.

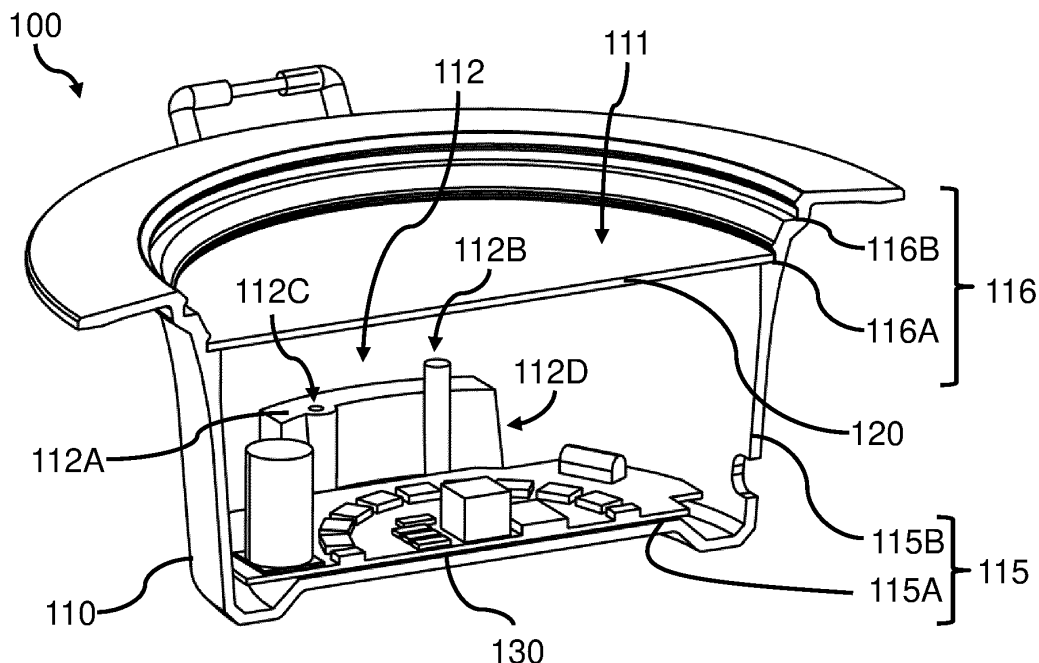


FIG. 1

Description

FIELD OF THE INVENTION

[0001] The invention relates to the field of housings for luminaires, and in particular to housings for luminaires comprising a printed circuit board.

BACKGROUND OF THE INVENTION

[0002] Many luminaires, such as certain downlights, are sold as sealed modules comprising a housing that holds a printed circuit board (PCB) comprising a driver and at least one LED, and optionally an optical element (window optics).

[0003] Different luminaires may use different size designs of PCB that require them to be mounted onto the housing differently. For example, some luminaires have one-sided PCBs, while other luminaires require two-sided PCBs to accommodate larger electrical components. The housings for different luminaires therefore have different structures according to the size and type of PCB used in the luminaire. This increases manufacturing costs, and means that a housing produced for one luminaire cannot be used in another luminaire should the demand for different luminaires change.

[0004] There is therefore a need for a housing that may be used in a variety of luminaires that require different PCBs.

SUMMARY OF THE INVENTION

[0005] The invention is defined by the claims.

[0006] According to examples in accordance with an aspect of the invention, there is provided a housing for a luminaire, adapted to hold a printed circuit board.

[0007] The housing comprises: a light exit window; a first mounting element configured to allow the printed circuit board to be mounted thereon; and a second, different mounting element on an inner side wall of the housing, configured to allow the printed circuit board to be mounted thereon, wherein the second mounting element is more proximate to the light exit window than the first mounting element, to thereby enable the printed circuit board to be mounted at different heights with respect to the light exit window.

[0008] The first and second mounting elements allow the same housing to be used for luminaires with different technical or "look and feel" requirements, e.g. to mount a PCB at different heights within the same housing. For example, enabling a PCB to be mounted at different heights with respect to the light exit window enables the light distribution of the luminaire to be modifiable, depending upon the use case scenario.

[0009] The proposed housing also allows different types of PCBs to be mounted within the same housing (e.g. different size and/or shaped PCBs or different configurations for PCBs).

[0010] The proposed housing can also enable a choice to be made between use of a two-sided PCB or a one-sided PCB. For example, a two-sided PCB could be mounted on the second mounting element, whereas a one-sided PCB could be mounted on the first or second mounting element depending upon implementation requirements. This improves a flexibility of use for the housing.

[0011] The second mounting element is connected (i.e. attached or supported by) the inner side wall of the housing. This provides a sturdy support for defining the position of the PCB within the housing, when mounted on the second mounting element.

[0012] In some embodiments, the second mounting element comprises at least one ridge extruding from the inner side wall of the housing, the at least one ridge being configured to allow the printed circuit board to be mounted thereon.

[0013] The ridge provides a support for the printed circuit board that is displaced from a rear(most) inner surface of the housing. In particular, this structure allows a printed circuit board to be mounted partway up the inner wall of the housing, and may be used to mount a two-sided printed circuit board on the housing. This allows the housing to be used in a downlight with additional features that require larger electrical components on the printed circuit board.

[0014] The ridge may be configured to abut the PCB when it is mounted to the second mounting element, thereby defining the position of the PCB within the housing when it is mounted on the second mounting element.

[0015] In some embodiments, the at least one ridge of the second mounting element further comprises a support structure, configured to connect the at least one ridge to an inner surface of the housing facing the light exit window of the housing. This provides reinforcement to the ridge, reducing a likelihood that it will bend and flex when mounting a PCB thereon (increasing a stability of the PCB).

[0016] In some embodiments, the second mounting element comprises: at least one peg, protruding from a first surface of the at least one ridge, and configured to engage with a printed circuit board; and/or at least one hole in a second surface of the at least one ridge, and configured to engage with a printed circuit board. This provides a simple mechanism for securing the PCB to the second mounting element, and thereby displacing the PCB from a rear(most) inner surface of the housing. In particular, the peg and/or hole may engage with a corresponding hole and/or peg of the PCB, to lock or secure the PCB to the mounting element.

[0017] Preferably, the first and/or second surface of the at least one ridge comprises a surface of the at least one ridge that faces the light exit window. This results in the PCB being at a same angle with respect to the light exit window when mounted on the first mounting element as when mounted on the second mounting element.

[0018] The first and second surfaces may be the same.

[0019] In some embodiments, the housing further comprises at least one peg, protruding from the inner surface of the housing facing the light exit window of the housing, and configured to engage with a printed circuit board; and/or at least one protuberance, protruding from the inner surface of the housing facing the light exit window of the housing, comprising a hole in a surface of the protuberance facing the light exit window configured to engage with a printed circuit board. Thus, pegs and/or holes may be disconnected from the ridge (if present).

[0020] In some embodiments, the first mounting element is positioned on an inner surface of the housing facing the light exit window. In particular, the first mounting element may be positioned on a rear(most) inner surface of the housing, so that, when mounted on the first mounting element, the PCB is as distant from the light exit window as possible (within the housing). This provides a sturdy support or abutting element for the PCB.

[0021] In particular, this structure allows a printed circuit board to be mounted on the inner surface of the housing facing a light exit window of the housing, and may be used to mount a one-sided printed circuit board on the housing.

[0022] The first mounting element may comprise: at least one peg, protruding from an inner surface of the housing facing the light exit window of the housing, and configured to engage with a printed circuit board; and/or at least one hole in the inner surface of the housing facing the light exit window of the housing, and configured to engage with a printed circuit board.

[0023] In this way, the first mounting element may comprise, for example, an analogous mounting system as the second mounting element, so that a same mounting system of a PCB can be used to connected to either the first or second mounting element. This avoids the need for a PCB to comprise two separate types of mounting system to facilitate mounting on two different mounting elements.

[0024] In particular, the peg and/or hole may engage with a corresponding hole and/or peg of the PCB, to lock or secure the PCB to the mounting element.

[0025] Preferably, the first and second mounting elements have similar/identical geometries, but are oriented at different angles with respect to the light exit window. This increases an ease of selection as to which mounting element to use for the PCB, as the choice of the mounting element can be made by simply rotating the PCB in the housing.

[0026] The housing may comprise a third mounting element comprising at least two steps in a rim around the light exit window of the housing, to thereby enable optical elements to be mounted at different heights with respect to the light exit window.

[0027] An optical element is any suitable element for modifying properties of light (e.g. color, distribution, angle etc.) of light output from the housing of the luminaire. An optical element may be called window optics.

[0028] In this way, the same housing may be used for

luminaires with different diameters of optical elements, and/or for luminaires with multiple optical elements. Exemplary optical elements include light diffusers, (transparent) protective elements, color filters, lenses and so on.

[0029] In some embodiments, the housing further comprises at least one fastener, mounted on an exterior wall of the housing, for attaching the housing/luminaire to a ceiling fixture.

[0030] According to examples in accordance with another aspect of the invention, there is provided a luminaire, comprising: the housing of any previously described embodiment; and a printed circuit board, mounted on the first mounting element or the second mounting element of the housing, and comprising a driver and at least one LED.

[0031] In some embodiments, the printed circuit board is mounted on the second mounting element and wherein different electronic components of the driver and/or at least one LED are positioned on both sides of the printed circuit board.

[0032] In some embodiments, the printed circuit board may be configured to engage with at least one peg and/or at least one hole of the housing (if present). In some examples, the printed circuit board may further comprise: at least one peg, each configured to engage with a hole of the housing; and/or at least one hole, each configured to engage with a peg of the housing.

[0033] In some embodiments, the luminaire may comprise at least two optical elements, each mounted on a respective one of the at least two steps of the third mounting element (if present). The optical elements may comprise one or more of: a light diffuser, a (transparent) protective element, a color filter, a lens and so on.

[0034] There is also proposed a printed circuit board for mounting in any previously described housing. The printed circuit board comprises a driver and at least one LED and is shaped so that: when placed in the housing in a first orientation, it makes contact with the first mounting element to be mountable thereon, and avoids contact with the second mounting element, and when placed in the housing in a second, different orientation, it makes contact with the second mounting element to be mountable thereon.

[0035] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] For a better understanding of the invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example only, to the accompanying drawings, in which:

Fig. 1 is a cutaway diagram of a luminaire, according to an embodiment of the invention;

Fig. 2 is a cutaway diagram of a luminaire, according

to another embodiment of the invention;

Fig. 3 is a cutaway diagram of a luminaire, according to another embodiment of the invention;

Fig. 4 is a diagram of an exterior of a luminaire, according to an embodiment of the invention; and

Fig. 5 is a diagram of an exterior of a luminaire, according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0037] The invention will be described with reference to the Figures.

[0038] It should be understood that the detailed description and specific examples, while indicating exemplary embodiments of the apparatus, are intended for purposes of illustration only and are not intended to limit the scope of the invention. These and other features, aspect, and advantages of the apparatus of the present invention will become better understood from the following description, appended claims, and accompanying drawings. It should be understood that the Figures are merely schematic and are not drawn to scale. It should also be understood that the same reference numerals are used throughout the Figures to indicate the same or similar parts.

[0039] According to a concept of the invention, there is proposed a housing for a luminaire, configured such that a printed circuit board may be mounted on the housing in at least two different positions, e.g. according to the printed circuit board design, position and/or orientation. The housing comprises a light exit window, a first mounting element and a second mounting element that facilitate mounting of the printed circuit board in the housing at different heights with respect to the light exit window. The second mounting element is positioned on or connected to an inner side wall of the housing.

[0040] Embodiments are at least partly based on the realization that the same housing may be used for a variety of luminaires (or luminaire configurations) through the use of two different mounting elements that allow a printed circuit board of the luminaire to be mounted at different heights (distances) with respect to the light exit window of the housing.

[0041] Illustrative embodiments may, for example, be employed in luminaires sold as sealed modules, such as downlights.

[0042] In the Figures hereafter described, the same housing is used in different configurations to provide different embodiments for a luminaire. Variations on the housing are described where appropriate.

[0043] Figure 1 illustrates a cutaway diagram of a luminaire 100, according to an embodiment of the invention. The luminaire 100 comprises a housing 110, an optical element 120 and a printed circuit board (PCB) 130. The housing 110 is, itself, an embodiment of the invention.

[0044] The housing 110 comprises a shell that defines inner/interior surfaces/walls 115 and outer/exterior sur-

faces/walls that house the optical element and PCB. In particular, the inner surfaces/walls of the housing 110 include an (rearmost) inner surface 115A that faces the light exit window and an inner side wall 115B that extends from the (rearmost) inner surface 115A to the light exit window. The inner surface 115A is an inner surface of the housing that is most distant from the light exit window 111. The PCB is located within a volume defined by the inner walls.

[0045] The housing 110 comprises a light exit window 111, a first mounting element (not visible in Figure 1) on the inner surface 115A of the housing facing the light exit window 111 and a second mounting element 112 on the inner side wall 115B.

[0046] The second mounting element 112 is on an inner side wall 115B of the housing 110, being a wall which extends from a surface 115A of the housing that faces (i.e. opposes) the light exit window 111, to the light exit window 111 itself. In other words, the inner side wall 115B is adjacent to the light exit window. In particular, the second mounting element 112 is in direct contact, is fixed, is mounted on or is otherwise supported by the inner side wall 115B of the housing 110.

[0047] The PCB 130 is here mounted on the first mounting element.

[0048] The first mounting element may comprise at least one peg and at least one hole (not visible), each of which may be configured to engage with a PCB in order for the PCB to be mounted on the first mounting element. However, other engaging mechanisms for mounting a PCB on the first mounting element will be apparent to the skilled person. For example, the PCB may be adhered to the inner surface of the housing facing the light exit window, or a clipping mechanism may be used.

[0049] The illustrated second mounting element 112 comprises a ridge 112A that protrudes from the inner wall 115B. Thus, the ridge 112A is a surface or protrusion that extends outwardly from the inner wall 115B. The ridge 112A may comprise a surface that faces the light exit window, e.g. is parallel to the inner surface 115A of the housing that faces the light exit window.

[0050] The ridge 112A and/or second mounting element 112 is configured so that the PCB 130, if mounted on the second mounting element 112, abuts the ridge (e.g. so that the ridge prevents or restricts further movement of the PCB 130 towards the first mounting element).

[0051] In this way, the PCB may be mounted partway up the inner wall of the housing, effectively decreasing the distance between the PCB 130 (where the LED is located) and the light exit window 111 (compared to if the PCB is mounted on the first mounting element). This decreased distance between allows the light output by the luminaire to have a larger beam angle.

[0052] It is recognised that as some of the driver components, e.g., capacitors or transformers, have a relatively substantial height, if these components are mounted on the same side as the LED on the PCB, they will likely block (some of) the light, and reduce the uniformity

of the output light profile. Thus, for PCBs mounted on the second mounting element, it would be beneficial if the PCB were a two-sided PCB. In particular, the space beneath the PCB (when it is mounted on the second mounting element) can be fully utilized for these driver components.

[0053] It shall be noticed that, when the PCB 130 is mounted on the first mounting element, the driver components are at the same side (of the PCB) as the LED. Because the distance between the light source and the light exit window 111 is large enough for light mixing, the light blocking effect by the relatively tall/high drive component(s) will not significantly affect the uniformity of output light.

[0054] The illustrated second mounting element 112 further comprises a peg 112B protruding from a first surface of the ridge 112A and a hole 112C in a second surface of the ridge 112A. The peg and hole are each configured to engage with a PCB, in order that a PCB may be mounted partway up the inner wall of the housing. This allows a two-sided PCB to be mounted on the housing 110 (or a single sided PCB to be mounted at different heights).

[0055] The first and second surfaces of the ridge 112A may be the same, and may be a surface of the ridge 112A that faces the light exit window.

[0056] In some embodiments, one or both of the peg 112B and hole 112C may be omitted. In their place, the ridge may be adapted to comprise an alternative engaging mechanism for mounting the PCB thereon. For example, the PCB may be adhered to the ridge 112A, or a clipping mechanism could be used.

[0057] In some embodiments, the second mounting element may comprise a plurality of pegs and/or a plurality of holes, each of which may be similar to the previously described peg and/or hole.

[0058] The second mounting element 112 may further comprise a support structure 112D connecting the ridge 112A to the inner surface 115A of the housing facing the light exit window 111, for improved stability. Of course, in some embodiments, the second mounting element may comprise the ridge 112A without a support structure 112D, i.e. the support structure 112D can be omitted.

[0059] Although only a single ridge 112A has been illustrated, in some embodiments, the second mounting element 112 may comprise a plurality of ridges, each of which may be embodied as previously described. For example, the second mounting element may comprise two ridges protruding from opposite sides of the inner side wall 115B of the housing. As another example, the second mounting element may comprise three ridges that are equidistant from one another (e.g. positioned at 120° intervals around the inner side wall). Thus, the second mounting element may comprise a plurality of ridges, positioned equidistant from one another (e.g. at regular intervals around the inner side wall).

[0060] In alternative embodiments, the ridge 112A of the second mounting element may be omitted, and the

second mounting element may comprise at least one peg and/or at least one hole for allowing a PCB to be mounted partway up the inner wall of the housing.

[0061] For example, the second mounting element may comprise, rather than a ridge, at least one peg protruding from the surface 115A of the housing facing the light exit window and at least one protuberance, protruding from the surface 115A of the housing facing the light exit window and comprising a hole in a surface of the protuberance facing the light exit window. The at least one peg and the hole of the at least one protuberance may each be configured to engage with a PCB. The heights of the at least one peg and the at least one protuberance may be such that a (generally flat) PCB is able to engage with the at least one peg and the hole of the at least one protuberance simultaneously.

[0062] In this way, the PCB may be offset from the inner surface 115A of the housing facing the light exit window 111 without needing to engage with a ridge.

[0063] Of course, the second mounting element may comprise both a ridge and a peg and/or hole unattached to the ridge 112A, as previously described.

[0064] The illustrated housing 110 further comprises a third mounting element 116 comprising at least two steps 116A, 116B that form a rim around the light exit window 111 of the housing 110, to thereby enable optical elements 120 to be mounted at different heights with respect to the light exit window 111. In Figure 1, an optical element 120 is mounted on a first step 116A of the third mounting element 116.

[0065] Suitable examples of optical elements for positioning in a rim around the light exit window (which can be called "window optics") would be apparent to the skilled person, and may include light diffusers, (transparent) protective elements, color filters, lenses and so on.

[0066] The third mounting element 116 comprises a (first) step 116A in the rim around the light exit window 111, such that an optical element can be mounted thereon. The (second) step 116B of the third mounting element has a larger diameter than the first step 116A, allowing an optical element of a larger diameter to be mounted on the third mounting element.

[0067] In some embodiments, the third mounting element 116 may comprise more than two steps (i.e. of different diameters), allowing a range of sizes of optical elements to be mounted on the housing 110.

[0068] Of course, more than one optical element may be mounted on the third mounting element (e.g. on different steps of the third mounting element).

[0069] To mount or secure an optical element to (a step 116A, 116B) of the third mounting element 116, any suitable securing mechanism may be used, such as adhesive, a clip or a jamming mechanism.

[0070] The third mounting element 116 may, in some embodiments, be omitted or replaced by a single optical element mounting element (for mounting only a single optical element thereon).

[0071] The printed circuit board 130 may be configured

or shaped so that: when placed in the housing in a first orientation, it makes contact with the first mounting element to be mountable thereon, and avoids contact with the second mounting element, and when placed in the housing in a second, different orientation, it makes contact with the second mounting element to be mountable thereon.

[0072] This can be achieved through appropriate shaping of the (base of the) printed circuit board, e.g. including a cut-out portion shaped to avoid the second mounting element at the first orientation.

[0073] Thus, the printed circuit board may have a finite order of rotational symmetry.

[0074] Figure 2 illustrates a cutaway diagram of a luminaire 200, according to another embodiment of the invention. The luminaire 200 comprises the same housing 110 described above, an optical element 220 and a PCB 230.

[0075] The luminaire 200 differs from the luminaire 100 of Figure 1 in that the PCB 230 is mounted on the second mounting element 112. This configuration means that elements of the first mounting element 210 (not previously visible) can now be seen.

[0076] The first mounting element 210 is positioned on the surface 115A of the housing that faces the light exit window (the "rearmost inner wall" 115A, being the most distant inner surface from the light exit window). The illustrated first mounting element 210 comprises a peg 215 that is configured to engage with a corresponding hole 231 of the PCB. However, other mechanisms for mounting a PCB to the housing (via the first mounting mechanism) will be apparent to the skilled person (e.g. adhesive, clipping mechanisms, jamming mechanisms and so on).

[0077] In particular examples, the first mounting element 210 may be positioned so that the PCB, when mounted on the first mounting element 210, abuts the surface 115A of the housing that faces the light exit window (a "rearmost inner wall" of the housing).

[0078] Figure 2 also illustrates a PCB 230 for a luminaire 200 according to an embodiment of the invention.

[0079] In particular, the PCB 230 is a two-sided PCB having electronic components (e.g. of an LED array 232 and driver 233) distributed over a first side and a second, different side of the PCB. Due to the presence of electronic components on the second side of the PCB 230, the PCB 230 cannot be mounted on the first mounting element of the housing 110 (as the components prevent contact with the first mounting element)) and is instead mounted on the ridge 114 of the second mounting element.

[0080] The PCB 230 comprises a peg (not visible in Figure 2), configured to engage with the hole in the ridge 112A (not visible in Figure 2), and a hole 234, configured to engage with the peg 112B protruding from the ridge 112A. The peg of the PCB 230 protrudes from the surface of the second side of the PCB.

[0081] The peg of the PCB 230 and the hole 112C in

the ridge 112A may have complementary geometry to allow the peg of the PCB 230 to engage with the hole in the ridge 112A. Similarly, the peg 112B protruding from the ridge 112A and the hole 231 of the PCB 230 may have complementary geometry to allow the peg 112B protruding from the ridge 112 to engage with the hole 231 of the PCB 230.

[0082] One or both of the peg and hole of the PCB may be omitted, depending upon the embodiment. Other engagement mechanisms (to supplement or replace the peg and/or hole) may be used, such as adhesive, clipping mechanisms or the like.

[0083] The printed circuit board 230 may be configured or shaped so that: when placed in the housing in a first orientation, it makes contact with the first mounting element to be mountable thereon, and avoids contact with the second mounting element, and when placed in the housing in a second, different orientation, it makes contact with the second mounting element to be mountable thereon.

[0084] Figure 3 illustrates a cutaway diagram of a luminaire 300, according to another embodiment of the invention. The luminaire 300 comprises the housing 110 described above, a first optical element 320, a second optical element 325 and a PCB 330.

[0085] The first optical element is mounted on a first step 116A of the third mounting element 116 of the housing 110. The second optical element 325 has a larger diameter than the first optical element 320, and is mounted on the second step 116B of the third mounting element 116 of the housing.

[0086] The illustrated PCB 330 is a one-sided PCB, e.g. having electronic components (but not necessarily tracks or interconnects) positioned on a same side of the PCB, and is mounted on the first mounting element of the housing.

[0087] Figure 4 illustrates an exterior of a luminaire 400, according to an embodiment of the invention. The luminaire 400 comprises the housing 110 as previously described, an optical element and PCB (not visible in Figure 4), and fasteners 440 and 450.

[0088] The fasteners 440 and 450 are configured to enable the luminaire to be attached to a ceiling fixture. Two fasteners are shown in Figure 4, but any number of one or more fasteners may be used. The fasteners 440 and 450 in Figure 4 are spring fasteners. Other suitable types of fastener may be used and will be apparent to the skilled person, e.g. clips, screws and/or screw fittings and so on.

[0089] Figure 5 illustrates another view of the exterior of the luminaire 400, in which optical element 420 is visible. The optical element 420 is mounted on a first step 116A of a third mounting element of the housing 110.

[0090] Although described embodiments of the invention mount a PCB and/or optical element onto the housing using a peg and/or a hole, other embodiments envisage using alternative engaging methods for mounting a PCB to the first mounting element or second mounting element

and/or for mounting an optical element to the third mounting element (if present). Example mounting elements may include one or more clips, one or more screws, and/or adhesive for securing the PCB or optical element to a mounting element.

[0091] Variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. If the term "adapted to" is used in the claims or description, it is noted the term "adapted to" is intended to be equivalent to the term "configured to".

[0092] Any reference signs in the claims should not be construed as limiting the scope.

Claims

1. A housing (110) for a luminaire (100, 200, 300, 400), adapted to hold a printed circuit board (130, 230, 330) comprising a driver (233) and at least one LED (232), the housing comprising:
 - a light exit window (111);
 - a first mounting element (210) configured to allow the printed circuit board to be mounted thereon; and
 - a second, different mounting element (112) on an inner side wall (115B) of the housing, configured to allow the printed circuit board to be mounted thereon,
 wherein the second mounting element is more proximate to the light exit window than the first mounting element, to thereby enable the printed circuit board to be mounted at different heights with respect to the light exit window.
2. The housing (110) of claim 1, wherein the second mounting element (112) comprises at least one ridge (112A) extruding from the inner side wall (115B) of the housing, the at least one ridge being configured to allow the printed circuit board to be mounted thereon.
3. The housing (110) of claim 2, wherein the second mounting element further comprises a support structure (112D), configured to connect the at least one ridge (112A) to an inner surface (115A) of the housing facing the light exit window (111) of the housing.
4. The housing (110) of any of claims 2 or 3, wherein the second mounting element (112) comprises:
 - at least one peg (112B), protruding from a first surface of the at least one ridge, and configured to engage with a printed circuit board; and/or
 - at least one hole (112C) in a second surface of the at least one ridge, and configured to engage with a printed circuit board.
5. The housing (110) of claim 4, wherein the first and/or second surface of the at least one ridge (112A) comprises a surface of the at least one ridge that faces the light exit window (111).
6. The housing of any of claims 1 to 5, wherein the second mounting element further comprises:
 - at least one peg, protruding from the inner surface of the housing facing the light exit window of the housing, and configured to engage with a printed circuit board; and/or
 - at least one protuberance, protruding from the inner surface of the housing facing the light exit window of the housing, comprising a hole in a surface of the protuberance facing the light exit window configured to engage with a printed circuit board.
7. The housing (110) of any of claims 1 to 6, wherein the first mounting element (210) is positioned on an inner surface (115A) of the housing facing the light exit window.
8. The housing (110) of claim 7, wherein the first mounting element comprises:
 - at least one peg (215), protruding from an inner surface (115A) of the housing facing the light exit window (111) of the housing, and configured to engage with a printed circuit board (230); and/or
 - at least one hole in the inner surface of the housing facing the light exit window of the housing, and configured to engage with a printed circuit board.
9. The housing (110) of any of claims 1 to 8, further comprising at least one fastener (440, 450), mounted on an exterior wall of the housing, for attaching the luminaire (100) to a ceiling fixture.
10. The housing (110) of any of claims 1 to 9, further comprising
 - a third mounting element (116) comprising at least two steps (116A, 116B) in a rim around the light exit window (111) of the housing, to thereby enable optical elements (220, 320, 325, 420) to be mounted at different heights with respect to the light exit window.

11. A luminaire (100, 200, 300, 400), comprising:

the housing (110) of any of claims 1 to 10; and
a printed circuit board (130, 230), mounted on
the first mounting element or the second mount- 5
ing element of the housing, and comprising a
driver (233) and at least one LED (232).

12. The luminaire of claim 11, wherein the printed circuit
board (130, 230) is mounted on the second mounting 10
element and wherein different electronic compo-
nents of the driver and/or at least one LED are po-
sitioned on both sides of the printed circuit board.

13. A luminaire (100, 200, 300, 400), comprising: 15

the housing (110) of any of claims 4, 5 or 8;
a printed circuit board (130, 230), mounted on
the first mounting element or the second mount-
ing element of the housing, comprising a driver 20
(233) and at least one LED (232), and configured
to engage with at least one peg (112B, 215)
and/or at least one hole (112C) of the housing.

14. A luminaire (100, 200, 300, 400), comprising: 25

the housing (110) of claim 10;
a printed circuit board (130, 230), mounted on
the first mounting element or the second mount-
ing element of the housing, and comprising a 30
driver (233) and at least one LED (232);
and at least two optical elements (320, 325),
each mounted on a respective one of the at least
two steps of the third mounting element.

15. A printed circuit board (130, 230) for mounting in a
housing for a luminaire according to any of claims 1
to 10, the printed circuit board comprising a driver
(233) and at least one LED (232),
wherein the printed circuit board is shaped so that: 40

when placed in the housing in a first orientation,
it makes contact with the first mounting element
to be mountable thereon, and avoids contact
with the second mounting element, and 45
when placed in the housing in a second, different
orientation, it makes contact with the second
mounting element to be mountable thereon.

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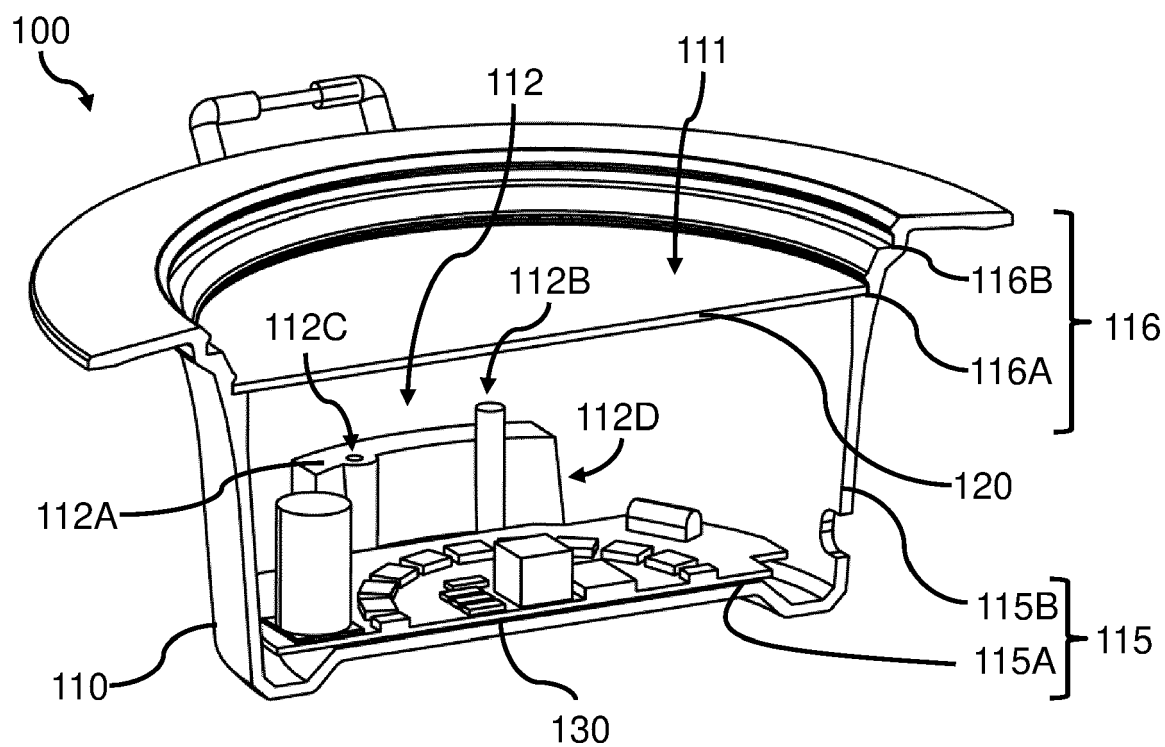


FIG. 1

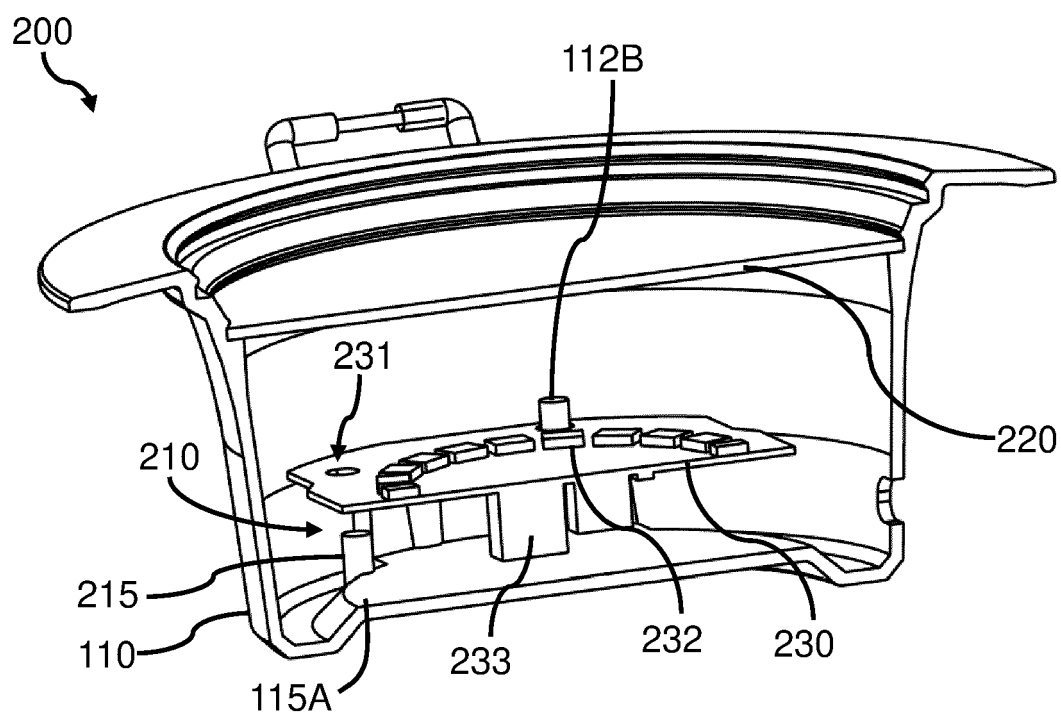


FIG. 2

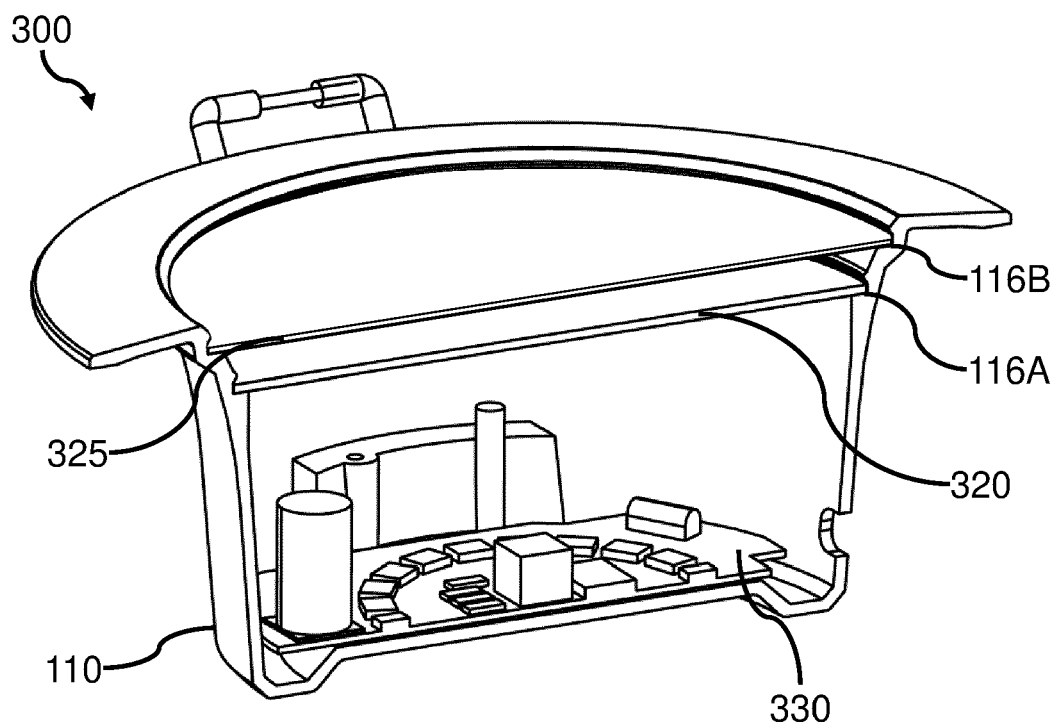


FIG. 3

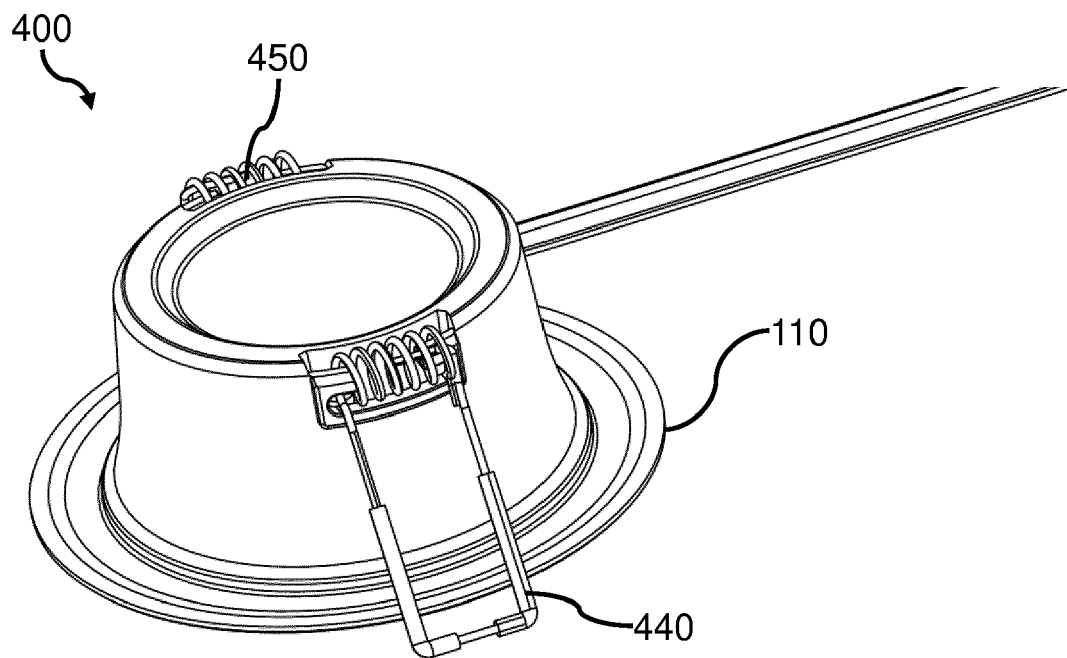


FIG. 4

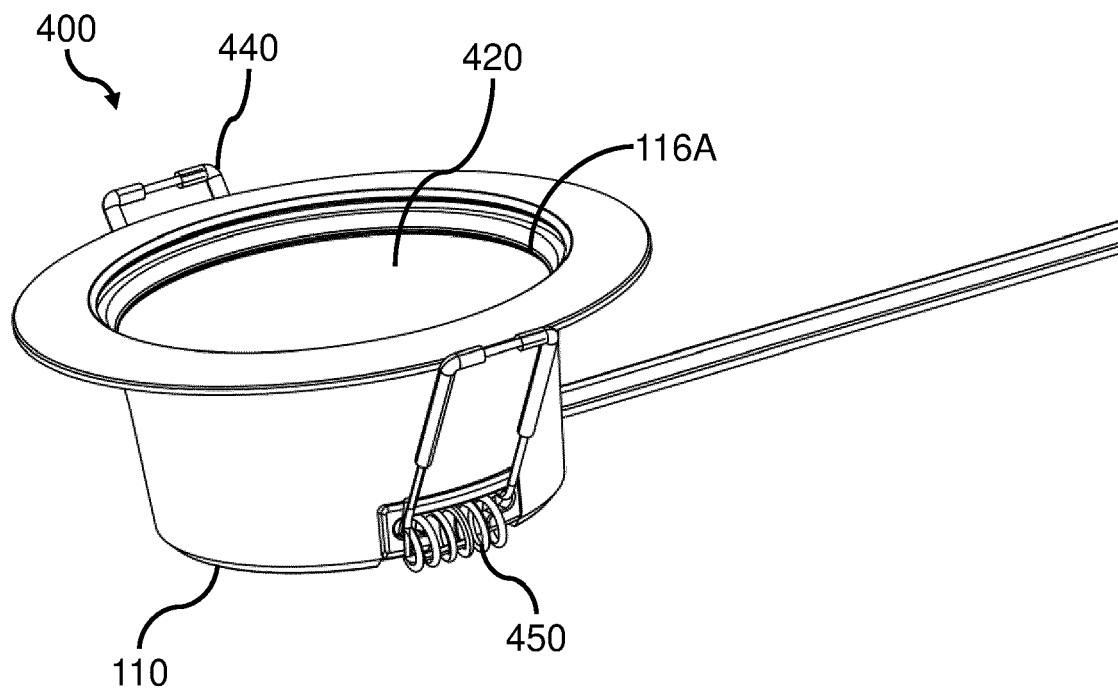


FIG. 5



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Application Number
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