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(54) **A FIXTURE SUPPORT FOR INSTALLATION OF A BUILT-IN LIGHT SOURCE EMITTING OR ILLUMINATING VISIBLE LIGHT**

(57) The disclosure relates to a fixture support for installation of a built-in light source emitting or illuminating visible light, such as a spotlight, arranged to be fitted in a hole in a building structure such as a ceiling, a wall, or similar, wherein the fixture support comprises: at least one terminal, a housing, a sealing arrangement enclosing the outer surface of the housing, and one or more displacement means.

The disclosure further relates to a method for installation of a fixture support for installing a light source in a building structure and a use of the fixture support.

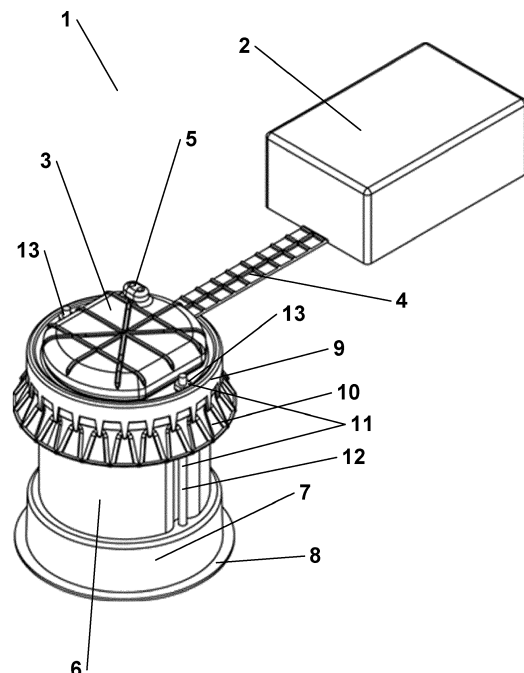


Fig. 1

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Description

Technical Field

[0001] The present disclosure relates to a fixture support for installation of a built-in light source emitting or illuminating visible light, a method for installation of a fixture support for installing a light source in a building structure, and a use of a fixture support.

Background art

[0002] Spotlights are becoming more and more in demand, especially after the advancement of affordable LEDs, as this limits the energy used by the light source, but also lowers the temperature generated when the light source is turned on, making it possible to install in various building structures without the hazard of starting a fire. Further, the design aspect of LED spotlights, especially ceiling constructions and wall constructions, are appealing to a large group of people.

[0003] However, due to increasing demands in building regulation, for example considering the environment, newly constructed houses and buildings needs to be more energy efficient. One way of making them more energy efficient is by lowering the amount of cracks, and holes, in the construction making the building more airtight than previous constructed buildings.

[0004] When spotlights are installed, a hole in the building structure, for the spotlight to be installed within, needs to be created. It is therefore important that this hole be sealed when the light source is installed to avoid unnecessary pass through of air through potential openings or unintentional openings. This is especially important if a vapour barrier is used in connection with the building structure, as a reseal of the vapour barrier is necessary for the vapour barrier to work properly.

[0005] Currently, the vapour barrier is taped around the hole in the building structure, comprising the vapour barrier, before the light source is installed. Alternatively, a foam ring can be taped around the hole in the building structure. Another solution could be to mount a box on one side of the building structure, and then tape, glue, or screw said box to the building structure, hereby trying to achieve a tight seal around the box. The light source can then afterwards be installed into the box.

[0006] However, the problems with the present solutions is that they are either too expensive in the form of addition mounting/installation time or in the cost of additional material, and at the same time they do not provide a solution in which the person installing the light can be sure that a proper seal around the hole is obtained. The person installing the light has therefore used time installing a light in which the seal around the hole is questionable. Further, if the solution of preinstalling a rather large box is used, it may remove a large amount of insulation material to make room for the box.

[0007] Even further, it may be needed to coordinate

between different professions, when installing spotlights as of present solutions.

[0008] Hence, there is a need to provide a solution, which can overcome the above problems, hereby providing a solution, which ensures proper sealing, reduce the installation time, and makes it so that only the electrician is needed when mounting and installing the light, hereby avoiding additional coordination between other professions.

Summary

[0009] It is an object of the present disclosure to overcome the above problems, and provide a fixture support for installation of a built-in light source emitting or illuminating visible light, such as a spotlight, arranged to be fitted in a hole in a building structure such as a ceiling, a wall, or similar, which ensures proper sealing, reduce the installation time, and where the electrician can install the light without any support.

[0010] Hence, according to a first aspect there is provided a fixture support for installation of a built-in light source emitting or illuminating visible light, such as a spotlight, arranged to be fitted in a hole in a building structure such as a ceiling, a wall, or similar, wherein the fixture support comprises: at least one terminal arrangement comprising first connection means for providing a connection between the light source and an electric power source; a housing having an inner and an outer surface, wherein the housing comprises a cavity configured for installation of the light source, the housing further comprises an opening for accessing the cavity and second connection means for connecting the light source to the first connection means when installed into the cavity of the housing; a sealing arrangement enclosing the outer surface of the housing; one or more displacement means configured to be operated so as to displace the sealing arrangement towards the end of the housing comprising the opening for accessing the cavity.

[0011] If for example, a vapour barrier is broken when drilling a hole in a building structure, it is important that this vapour barrier is sealed again upon installation of the fixture into the hole in the building structure, to make sure that the whole construction satisfies the strict building regulations. Hence, the present invention discloses a fixture support, which upon installation in a hole in a building structure can displace a sealing arrangement, located outside of the housing of the fixture support, by operating displacement means on said fixture support. Hereby a tight seal around the hole in the building structure is obtained, which ensure both fastening of the fixture support and a better airtight seal, then known fixture supports found on the market today.

[0012] In other words, when the seal arrangement of the present invention is displaced by the displacement means, after installation in a hole in a building structure, the seal arrangement is forced towards one side of the building structure until the fixture support is tightly fixed

to the building structure. This fixation indicates to the person installing the fixture supports that it is correctly installed and that an airtight seal is obtained.

[0013] Further, a solution according to the present disclosure lowers the required amount of work time for installing a fixture support, as the present solutions of taping, foaming, etc., is avoided, and where the taping, foaming, etc., is at present performed earlier in the building process it requires coordination between different professions, whereas the present fixture support can be installed late in the process and by the electrician only, which simplify the whole work process, for installation of e.g. spotlights in a ceiling structure, hereby also lowering the total cost per unit installed. Even further, the present solution provide for a way to install a light source with minimum removal of insulation material.

[0014] According to a second aspect there is provided a method for installation of a fixture support for installing a light source in a building structure, wherein the method comprises the steps of: providing a fixture support according to the first aspect; connecting an electrical power source to the first connection means; pushing the fixture support partly through a hole in the building structure, such that the sealing arrangement is pushed through the hole and hereby located on a second side of the hole in the building structure while the opening for accessing the cavity is still located on a first side of the hole in the building structure opposite of the second side of the hole in the building structure; operating the displacement means so as to displace the sealing arrangement towards the end of the housing comprising the opening for accessing the cavity, and hereby also towards the second surface of the building structure facing the second side of the hole in the building structure.

[0015] According to a third aspect there is provided a use of a fixture support according to the first aspect, for installation of a built-in light source in a building structure.

[0016] In one or more embodiments, the one or more displacement means are accessible from the inner surface of the housing through the opening for accessing the cavity.

[0017] It may be preferred to have the displacement means being accessible from the inner surface of the housing, as this will make the person installing the fixture support able to fixate and tighten the sealing arrangement without the need of changing position from one side of the building structure to the other, e.g. this would avoid mounting the fixture from the lower side of a ceiling and then afterwards have go to the ceiling and tighten the fixture support.

[0018] The displacement means are in preferred embodiments of the present disclosure accessible from the interior of the housing and can be accessed and operated through the opening for accessing the cavity. It may be screws or the like where the slot is placed and accessible from the interior of the housing. Alternatively, the displacement means may be a cable tie type fastening arrangement comprising an elongated member with teeth

that will engage with a pawl when pulling in the elongated member, such as a fastening system known from cable ties.

[0019] The displacement means are directly or indirectly connected to the sealing arrangement. Hereby a user may operate (such as pull, push, rotate, or the like) the displacement means, and this provides that the displacement means displace the sealing arrangement towards the end of the housing comprising the opening for accessing the cavity. The sealing arrangement can thus after the housing has been arranged in a hole in the building structure, such as the ceiling, be operated in order to be moved towards the end of the housing comprising the opening for accessing the cavity, and this will enable that the sealing arrangement can abut an inner surface and provide improved air tightness. In one or more embodiments, the sealing arrangement is further configured to provide at least a part of the primary attachment of the fixture support to the building structure. The sealing arrangement may press towards the side opposite to the first surface and hence comprise a sufficient compression force to hold the support in the hole after installation. Such an arrangement further simplifies the fixture support, and helps in easing the installation process.

[0020] In one or more embodiments, the one or more displacement means are accessible from the inner surface of the housing through the opening for accessing the cavity and wherein the displacement means when operated by a user are configured to displace the sealing arrangement towards the end of the housing comprising the opening for accessing the cavity hereby providing a compressing force so as to fixate the housing to the building structure.

[0021] In one or more embodiments, the housing further comprises an outer flange configured to support on a first surface of the building structure, and wherein the displacement means are configured to displace the sealing arrangement towards the flange so as to provide a pressure force towards a second surface of the building structure opposite of the first surface of the building structure.

[0022] The use of an outer flange, where the seal arrangement is displaced towards said flange, may further support the fixture support in achieving a tight seal around the hole in the building structure, as this will make a sandwich structure around the building structure, with the flange on one side, the seal arrangement on the other side, and the building structure in the middle.

[0023] In one or more embodiments, the flange is a collar or a ribbon configured to support on a first surface of the building structure. It is not necessary for the flange to fully enclose the outer surface of the housing, although this may be preferred, various different configurations of a flange structure might be suitable for the present invention.

[0024] In one or more embodiments, the flange is one or more flanges spaced apart and configured to support on a first surface of the building structure.

[0025] In one or more embodiments, the flange is arranged on the outer surface of the housing at or near the opening for accessing the cavity. It may be preferred that the flange is located as close to the end of the housing comprising the opening for accessing the cavity as possible, as this will provide a smooth and minimal surface on one side of the building structure. However, it may also be desired to have at least a small protrusion of the housing extending outside the hole in the building structure. Such protrusion could be used for various technical purposes, or simply be more aesthetically pleasing depending on the observer.

[0026] In one or more embodiments, the flange encloses the outer surface of the housing and the opening for accessing the cavity.

[0027] In one or more embodiments, the displacement means when operated by a user are configured to displace the sealing arrangement towards the flange, hereby providing a compressing force so as to fixate the housing to the building structure.

[0028] In one or more embodiments, the sealing arrangement is configured to provide a compressing force so as to fixate the housing to the building structure, when displaced towards the end of the housing comprising the opening for accessing the cavity or when displaced towards the flange. If the sealing arrangement can fixate the fixture support, no other means for fixation may be required, hereby obtaining a simply structure.

[0029] In one or more embodiments, the sealing arrangement is made of a resilient material. The resilient material may be a material, which is also elastic, bendable, and flexible. The sealing arrangement may be made of combinations of different types of material, where some is more resilient or flexible than others. Depending on the type of material the building structure is made of, the resilient material of the sealing arrangement could be changed to ensure a tight fit.

[0030] In one or more embodiments, the sealing arrangement is made of rubber, plastic, elastomer, or polymer material with a Shore OO value between 5 and 100. In one or more embodiments, the sealing arrangement is made of rubber, plastic, elastomer, or polymer material with a shore A value of less than 80. In one or more embodiments, the sealing arrangement is made of rubber, plastic, elastomer, or polymer material with a shore D value less than 30.

[0031] The Shore durometer is a device for measuring the hardness of a material, typically of polymers, elastomers, and rubbers. Higher numbers on the scale indicate a greater resistance to indentation and thus harder materials. Lower numbers indicate less resistance and softer materials. The term is also used to describe a material's rating on the scale, as in an object having a "Shore durometer" of 90." There are several scales of durometer, used for materials with different properties. The two most common scales, using slightly different measurement systems, are the ASTM D2240 type A and type D scales. The A scale is for softer ones, while the D scale is for

harder ones. However, the ASTM D2240-00 testing standard calls for a total of 12 scales, depending on the intended use: types A, B, C, D, DO, E, M, O, OO, OOO, OOO-S, and R. Each scale results in a value between 0 and 100, with higher values indicating a harder material.

[0032] In one or more embodiments, the sealing arrangement is made of a resilient material selected from rubber, foam, plastic, silicon, or combinations hereof.

[0033] In one or more embodiments, the sealing arrangement is made of a resilient, elastic, bendable, and flexible material having a spring-like effect. A spring-like effect is the effect obtained from an elastic movement of an object that has stored mechanical energy. When the material is compressed or stretched from its resting position, it exerts an opposing force approximately proportional to its change in length. The spring-like effect is the opposing force the material exerts when being compressed. This effect will increase the fixture and tightness of the seal arrangement when the seal arrangement material is compressed due to the displacement means exerting a force pushing the seal arrangement against a surface of the building structure. In other words, the material of the seal arrangement having a spring-like effect means that when the material is forced towards a surface it will exert a force in the opposite direction.

[0034] In one or more embodiments, the sealing arrangement is arranged coaxial to the flange at the outer surface of the housing or coaxial to the opening for accessing the cavity.

[0035] In one or more embodiments, the sealing arrangement is further configured to provide at least a part of the primary attachment of the fixture support to the building structure. If the sealing arrangement is configured to be at least a part of the primary attachment of the fixture support, other means may be added as secondary attachment means to further support this. However, they may also be excluded to make a simple structure easy to install. Other parts of the primary attachment could be a flange or other protrusion stopping the fixture support on the side opposite of the sealing arrangement, hereby for example making a sandwich structure.

[0036] In one or more embodiments, the sealing arrangement and the flange is configured to provide the primary attachment of the fixture support to the building structure.

[0037] In one or more embodiments, the diameter of the sealing arrangement enclosing the outer surface of the housing is larger than the diameter of the opening for accessing the cavity. In one or more embodiments, the diameter of the opening for accessing the cavity is between 55 and 120 mm, such as between 60 and 90 mm, such as between 65 and 85 mm, such as between 70 and 80 mm. The diameter of the opening for accessing the cavity depends on the size of the light source that is to be installed in said cavity.

[0038] In one or more embodiments, the housing is symmetrically shaped around a longitudinal plane and wherein the shape of the longitudinal plane of the housing

is selected from elliptic, circle, oval, square, rectangle, trapezium, parallelogram, rhombus, kite, triangle, right triangle, scalene triangle, pentagon, hexagon, heptagon, octagon, nonagon, or decagon.

[0039] In one or more embodiments, the housing is cone-, rectangular prism-, triangular prism-, pentagonal prism-, hexagonal prism-, quadrangular prism-, cylinder-, triangular pyramid-, rectangular pyramid-, pentagonal pyramid-, hexagonal pyramid-, or cube shaped.

[0040] In one or more embodiments, the opening for accessing the cavity is circular, rectangular, oval, square, rhombus, or triangle shaped.

[0041] In one or more embodiments, a transverse section of the housing is circular- or rectangular shaped.

[0042] In one or more embodiments, the one or more displacement means, configured to be operated so as to displace the sealing arrangement, comprises at least two displacement means configured to be operated so as to displace the sealing arrangement towards the end of the housing comprising the opening for accessing the cavity. In one or more embodiments, the displacement means comprises one or more screws, and wherein a rotation of the one or more screws provides the displacement of the sealing arrangement towards the end of the housing comprising the opening for accessing the cavity.

[0043] In one or more embodiments, the second connection means comprises a socket and at least one electric wire connecting the socket to the first connection means. In one or more embodiments, the socket is selected from ES/E27, SES/E14, BC/B22, SBC/B15, S15, GU10, G24d-1, G24d-2, G24d-3, G24q-1, G24q-2, G24q-3, GX24d-1, GX24d-2, GX24d-3, G9, E10, E11, E12, E17, E26, E39, EX39, GU24, G4, GU4, GU5.3, GY6.35, GU8, GY8, GY8.6, G9, G12, G53, or GES/E40. In one or more embodiments, the socket is selected from ES/E27, SES/E14, GES/E40, BC/B22, SBC/B15, GU5.3, G4, G53, or GU10. In one or more embodiments, the socket is selected from ES/E27, SES/E14, or GU10.

[0044] In one or more embodiments, the fixture support further comprises a holding arrangement configured to hold the sealing arrangement in place when inserting the fixture support into the building structure, and wherein the holding arrangement is configured to release the sealing arrangement when the sealing arrangement is displaced by the one or more displacement means.

[0045] A holding arrangement may be added to the fixture support to ensure that the sealing arrangement is not displaced by accident when the fixture support is mounted or installed in the hole in the building structure. The holding arrangement should be configured so it releases the sealing arrangement when it is displaced by the displacement means. Alternatively, the holding arrangement could be displaced with the sealing arrangement when displaced with the displacement means.

[0046] In one or more embodiments, the fixture support further comprises a light source installed in the housing. A fixture support of the present invention could comprise a preinstalled light source, hereby making the installation

process even faster. In one or more embodiments, the light source is selected from Incandescent lamps, such as Tungsten filament or Tungsten halogen; high discharge lamps, such as metal halide, mercury vapour, sodium vapour, or mercury fluorescent; or LED. In one or more embodiments, the light source is selected from fluorescent lamp, halogen lamp, sodium lamp, mercury lamp, or LED. In one or more embodiments, the light source is LED.

[0047] In one or more embodiments, the building structure comprises a vapour barrier arrangement. Vapour barriers are comprised in or may be an additional layer on various building structures. These are incorporated more and more into new structures due to building regulations being strict in regards to the airtightness of newer building.

[0048] In one or more embodiments, the building structure is a ceiling or a wall structure. In one or more embodiments, the building structure is a suspended ceiling.

[0049] In one or more embodiments, the building structure comprises a hole with a first side of the building structure facing towards an area to be illuminated and a second side opposite of the first side and facing away from the area to be illuminated, and wherein the housing further comprises an outer flange configured to support on the first surface of the building structure, and wherein the displacement means are configured to displace the sealing arrangement towards the flange so as to provide a pressure force towards the second surface of the building structure.

[0050] In one or more embodiments, the building structure comprises a hole with a first side of the building structure facing towards an area to be illuminated and a second side opposite of the first side and facing away from the area to be illuminated, and wherein the housing further comprises an outer flange configured to support on the first surface of the building structure, and wherein the displacement means are configured to displace the sealing arrangement towards the flange hereby forcing the sealing arrangement to tighten around the second side of the building structure and the housing hereby making a fixation of the fixture support in the hole and a seal of the remaining part of the hole between the building structure and the housing.

[0051] In one or more embodiments, the fixture support further comprises a frontal arrangement configured to cover at least a part of the end of the housing comprising the opening for accessing the cavity. In one or more embodiments, the frontal arrangement is configured to be attached to the housing, preferably so as to cover the flange. In one or more embodiments, the frontal arrangement may comprise a collar for covering a flange of the housing. In one or more embodiments, the frontal arrangement is configured to be attached to the housing, preferably so as to cover the flange. In one or more embodiments, the frontal arrangement encloses the opening for accessing the cavity. In one or more embodiments, the frontal arrangement comprises a light source holder

configured to clamp the light source and arranged to be installed in the housing.

[0052] A frontal arrangement as disclosed may make it easier to install the light source, or it may make a good finish on the fixture support when installed in the building structure. Additionally, it may make it easier for a user to change light source in the fixture if for example the light source is broken or another source is needed.

[0053] In one or more embodiments, the method comprises the step of mounting or installing the light source. In one or more embodiments, the method comprises the step of mounting or installing a frontal arrangement configured to cover at least a part of the end of the housing comprising the opening for accessing the cavity.

[0054] In one or more embodiments, the displacement means are operated until the sealing arrangement presses towards the second surface of the building structure facing the second side of the hole in the building structure.

[0055] In one or more embodiments, the displacement means are operated until the fixture support is fixated to the building structure via clamping from the sealing arrangement to the second surface of the building structure facing the second side of the hole in the building structure.

[0056] In one or more embodiments, the flange abut a first surface of the building structure facing the first side of the hole in the building structure, and wherein the displacement means are operated so as to displace the sealing arrangement until it is pressed against the second surface of the building structure facing the second side of the hole in the building structure.

[0057] Effects and features of the second and third aspects are to a large extent analogous to those described above in connection with the first aspect. Embodiments mentioned in relation to the first aspect are largely compatible with the second and third aspects. The present disclosure will become apparent from the detailed description given below. The detailed description and specific examples disclose preferred embodiments of the disclosure by way of illustration only. Those skilled in the art understand from guidance in the detailed description that changes and modifications may be made within the scope of the disclosure.

Brief description of the drawings

[0058] The above objects, as well as additional objects, features and advantages of the present disclosure will be more fully appreciated by reference to the following illustrative and non-limiting detailed description of example embodiments of the present disclosure, when taken in conjunction with the accompanying drawings.

Figure 1 shows a slightly turned side view of a fixture support according to an embodiment of the present disclosure.

Figure 2 shows a fixture support according to the embodiment of figure 1 in an exploded view.

Figure 3a shows a fixture support according to the embodiment of figure 1, in which the fixture support is pushed through the hole in the building structure.

Figure 3b shows a fixture support according to the embodiment of figure 3a, in which the displacement means have been operated by the person installing the fixture support.

Figure 4a shows a fixture support according to the embodiment of figure 1 viewed through the longitudinal centre plane of the housing of the fixture support.

Figure 4b shows a fixture support according to the embodiment of figure 1 viewed from the bottom when pushed through the hole of the building structure.

Detailed description

[0059] The present disclosure will now be described with reference to the accompanying drawings, in which preferred example embodiments of the disclosure are shown. The disclosure may, however, be embodied in other forms and should not be construed as limited to the herein disclosed embodiments. The disclosed embodiments are provided to fully convey the scope of the disclosure to the skilled person.

[0060] Figure 1 shows a fixture support 1 according to one embodiment of the present invention. The fixture support 1 comprises a terminal 2 for connecting the light source to be installed in the fixture support 1 to an electric power source. The terminal 2 is in this embodiment flexibly connected to a top part of the housing 3 via a strip of plastic 4. The strip of plastic 4 may be fabricated as a separate part, or it could be molded in one piece together with the top part of the housing 3.

[0061] In this embodiment, the top part of the housing 3 additionally comprises connection means 5 for attaching a wire, or the like, to make a conducting circuit between the top part of the housing 3 and the terminal 2.

[0062] The fixture support according to this embodiment further comprises the housing 6 including the top part of the housing 5. The housing 6 is in this embodiment cylindrically shaped around the longitudinal axis of the housing 6, and comprises an opening (not visible) in the bottom of the housing 6 for accessing a cavity (not visible) comprised within the housing 6 when the top part of the housing 3 is attached to the rest of the housing.

[0063] In the bottom part of the housing 6 a first flange 7, which is protruding from the housing 6 and enclosing the housing 6. In this particular embodiment, the first flange 7 has a diameter, which is slightly smaller than the hole in the building structure in which the fixture support 1 is arranged to be attached within. The flange 7 has a width, which corresponds to, or is slightly smaller than the depth of the hole in the building structure, i.e. the distance through the building structure from one side to

the other. From the bottom part of the first flange 7 is a second flange 8 protruding, where the second flange 8 encloses the first flange 7. The second flange 8 has a diameter which is larger than both the first flange 7 and the diameter of the hole in the building structure, hereby making it impossible to push the entire fixture support 1 through the hole in the building structure, but instead the second flange 8 will abut one side of the building structure and hereby obtain a lower part of a sandwich structure with the building structure in the middle.

[0064] The embodiment further comprises a holding arrangement 9, with a diameter similar in size as the diameter of the first flange 7. The holding arrangement is configured to temporarily fixate a sealing arrangement 10, so that the sealing arrangement 10 is not displaced when the fixture support 1 is pushed through the hole in the building structure. This fixation could for example be obtained as shown in figure 1 with small hooks interconnected with U- or V-shaped protrusions along the surface of the sealing arrangement 10. The small hooks in the holding arrangement 9 will fixate the sealing arrangement 10 when a small force is exerted on the sealing arrangement 10, such as when pushing the fixture support 1 through the hole in the building structure, but are at the same time configured to release the sealing arrangement 10 when a larger force is exerted on the sealing arrangement, such as when displacing the sealing arrangement 10 via the displacement means 11. When the sealing arrangement 10 is displaced by the displacement means 11, the sealing arrangement will be displaced towards the first and second flange 7, 8 hereby being displaced towards the building structure making the upper part of the sandwich structure. The sealing arrangement 10 is made of a resilient material, which will compress when the displacement means 11 forces it against the building structure. However, the material should also be flexible enough so it will fold when pushed through the hole in the building structure. The diameter of the sealing arrangement in a relaxed state is similar to the diameter of the second flange structure. The diameter will be decreased when the material folds or bends, such as when pushed through the hole, and the diameter will increase when the sealing arrangement 10 is forced against the side of the building structure. This expansion combined with the compression of the material ensures both a fixation of the fixture support 1 and a tight sealing of the hole in the building structure.

[0065] The displacement means 11 in this embodiment comprises threaded (not shown) rods 12 and nuts 13, where the rods 12 extend from the inside of the housing 6 through the first flange 7 and through the sealing arrangement, where it is connect with the nut 13, which is fixed or embedded within the sealing arrangement 10. When the threaded rods 12 are rotated/turned with for example a screw driver it will displace the nut 13 in the direction of the thread and hereby displace the sealing arrangement 10 towards the bottom of the fixture support 1.

[0066] Figure 2 shows a fixture support 1 according to the embodiment of figure 1 in an exploded view. In this view the cavity 12 inside the housing is visible.

[0067] Figure 3a and 3b shows a fixture support 1 according to the embodiment of figure 1 in which the fixture support 1 is pushed through the hole in the building structure 15 (figure 3a) and wherein the displacement means 11 have been operated by the person installing the fixture support 1, so that the sealing arrangement 10 has been displaced from the holding arrangement 9 and is forced against one side of the building structure 15 (figure 3b), hereby fixating the fixture support 1 to the building structure 15 and tight sealing the hole in the building structure 15.

[0068] Figure 4a shows a fixture support 1 according to the embodiment of figure 1 viewed through the longitudinal centre plane of the housing 6 of the fixture support 1 when pushed through the hole 16 of the building structure 15 as described in figure 3a. Here it can be seen that the width of the first flange 7 is slightly smaller than the depth of the hole 16 through the building structure 15. Further, it can be seen that the diameter of the holding arrangement 9 and the first flange 7 is slightly smaller than the diameter of the hole 16 through the building structure 15 and that the second flange 8 and the sealing arrangement 10 in its relaxed state both has a diameter larger than the diameter of the hole 16 in the building structure 15.

[0069] Further figure 4a shows that the cavity 14 expand the entire inside of the housing 6, where only thin sides of the housing 6 and the flanges 7, 8 are made of a solid material and the rest is the cavity 14.

[0070] Figure 4b shows a fixture support 1 according to the embodiment of figure 1 viewed from the bottom when pushed through the hole of the building structure 15 as described in figure 3a. Here it is seen that the displacement means 11 are operational from the inside of the housing 6. Further, connection means 17 for connecting a light source can be seen through the cavity 14. These connection means 17 are comprised on the top part of the housing 3.

References

[0071]

- 1- Fixture support
- 2- Terminal
- 3- Top part of housing
- 4- Strip of plastic
- 5- Connection means for attaching a wire
- 6- Housing
- 7- First flange
- 8- Second flange
- 9- Holding arrangement
- 10- Sealing arrangement
- 11- Displacement means
- 12- Rod

- 13- Nut
- 14- Cavity
- 15- Building structure
- 16- Hole through the building structure
- 17- Connection means for connecting a light source

Claims

1. A fixture support (1) for installation of a built-in light source emitting or illuminating visible light, such as a spotlight, arranged to be fitted in a hole (16) in a building structure (15) such as a ceiling, a wall, or similar, wherein the fixture support (1) comprises:
 - at least one terminal (2) arrangement comprising first connection means for providing a connection between the light source and an electric power source;
 - a housing (6) having an inner and an outer surface, wherein the housing (6) comprises a cavity (14) configured for installation of the light source, the housing (6) further comprises an opening for accessing the cavity (14) and second connection means (17) for connecting the light source to the first connection means when installed into the cavity (14) of the housing (6);
 - a sealing arrangement (10) enclosing the outer surface of the housing (6);
 - one or more displacement means (11) configured to be operated so as to displace the sealing arrangement (10) towards the end of the housing (6) comprising the opening for accessing the cavity (14).
2. The fixture support (1) according to claim 1, wherein the one or more displacement means (11) are accessible from the inner surface of the housing (6) through the opening for accessing the cavity (14) and wherein the displacement means (11) when operated by a user are configured to displace the sealing arrangement (10) towards the end of the housing (6) comprising the opening for accessing the cavity (14) hereby providing a compressing force so as to fixate the housing (6) to the building structure (15).
3. The fixture support (1) according to any of the preceding claims, wherein the housing (6) further comprises an outer flange (8) configured to support on a first surface of the building structure (15), and wherein the displacement means (11) are configured to displace the sealing arrangement (10) towards the flange (8) so as to provide a pressure force towards a second surface of the building structure (15) opposite of the first surface of the building structure (15).
4. The fixture support (1) according to any of the preceding claims, wherein the sealing arrangement (10) is made of a resilient material selected from rubber, foam, plastic, silicon, elastomer, polymer, or combinations hereof.
5. The fixture support (1) according to claim 3, wherein the sealing arrangement (10) and the flange (8) is configured to provide the primary attachment of the fixture support (1) to the building structure (15).
6. The fixture support (1) according to any of the preceding claims, wherein the fixture support (1) further comprises a holding arrangement (9) configured to hold the sealing arrangement (10) in place when inserting the fixture support (1) into the building structure (15), and wherein the holding arrangement (9) is configured to release the sealing arrangement (10) when the sealing arrangement (10) is displaced by the one or more displacement means (11).
7. The fixture support (1) according to any of the preceding claims, wherein the building structure (15) comprises a hole (16) with a first side of the building structure (15) facing towards an area to be illuminated and a second side opposite of the first side and facing away from the area to be illuminated, and wherein the housing (6) further comprises an outer flange (8) configured to support on the first surface of the building structure (15), and wherein the displacement means (11) are configured to displace the sealing arrangement (10) towards the flange (8) so as to provide a pressure force towards the second surface of the building structure (15).
8. The fixture support (1) according to any of the preceding claims, wherein the fixture support (1) further comprises a frontal arrangement configured to cover at least a part of the end of the housing (6) comprising the opening for accessing the cavity (14).
9. A method for installation of a fixture support (1) for installing a light source in a building structure (15), wherein the method comprises the steps of:
 - providing a fixture support (1) according to any of the preceding claims;
 - connecting an electrical power source to the first connection means;
 - pushing the fixture support (1) partly through a hole (16) in the building structure (15), such that the sealing arrangement (10) is pushed through the hole (16) and hereby located on a second side of the hole (16) in the building structure (15) while the opening for accessing the cavity (14) is still located on a first side of the hole (16) in the building structure (15) opposite of the second side of the hole (16) in the building structure (15);

- operating the displacement means (11) so as to displace the sealing arrangement (10) towards the end of the housing (6) comprising the opening for accessing the cavity (14), and hereby also towards the second surface of the building structure (15) facing the second side of the hole (16) in the building structure (15). 5

10. Use of a fixture support (1) according to any of claims 1-8, for installation of a built-in light source, in a building structure (15). 10

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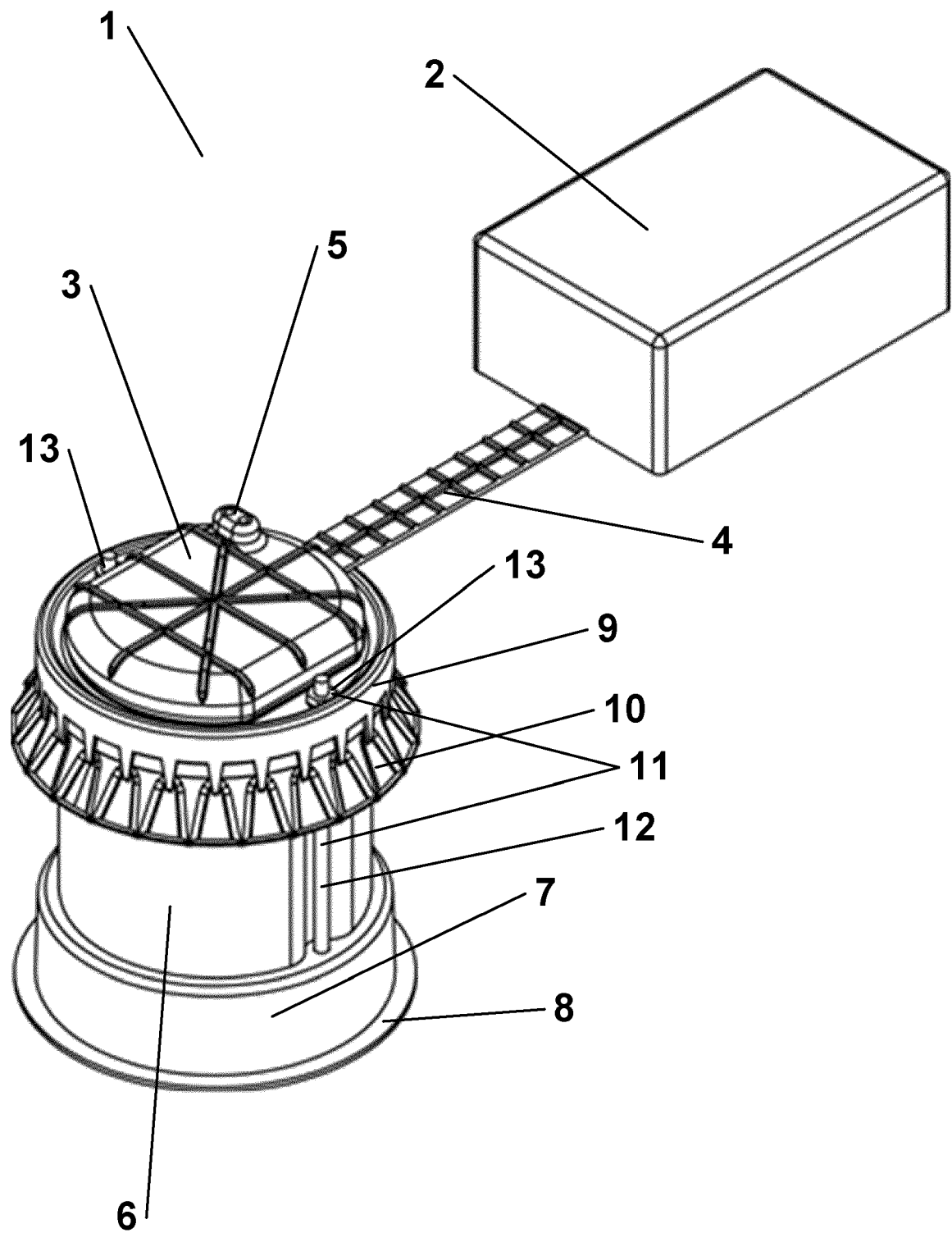


Fig. 1

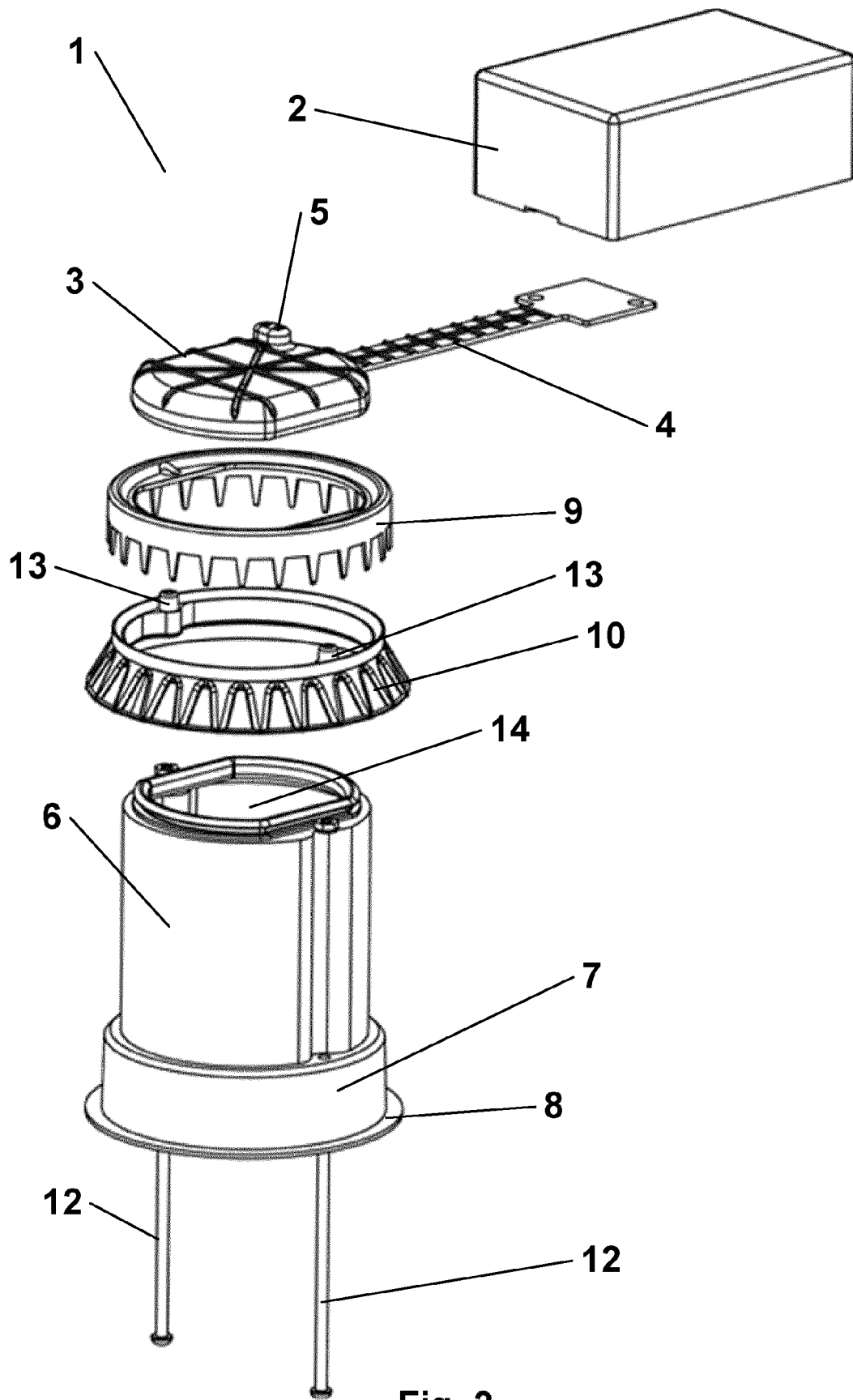


Fig. 2

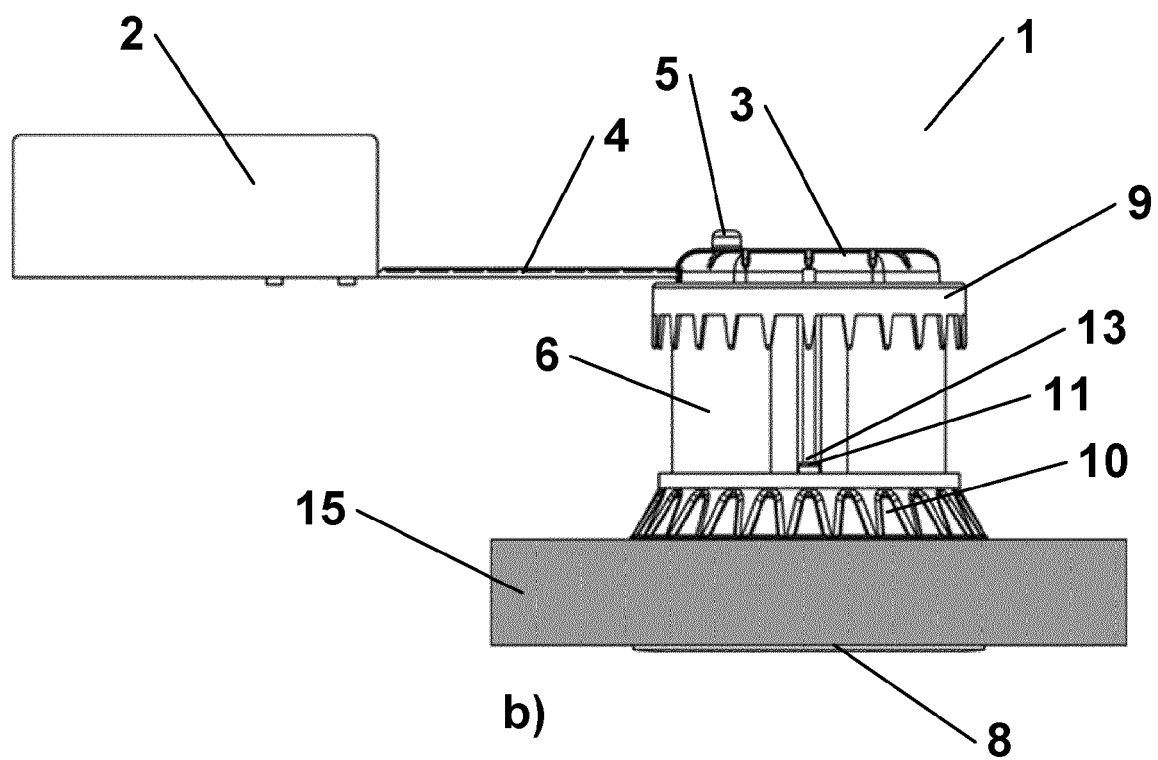
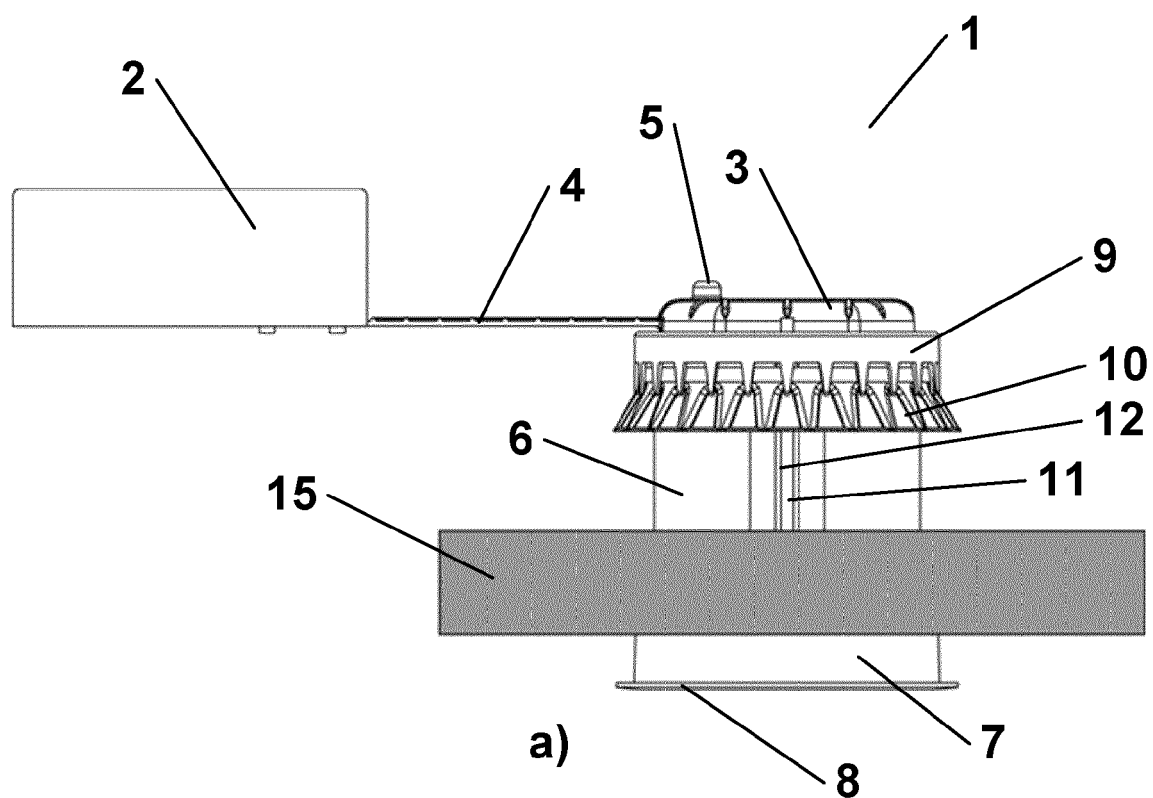


Fig. 3

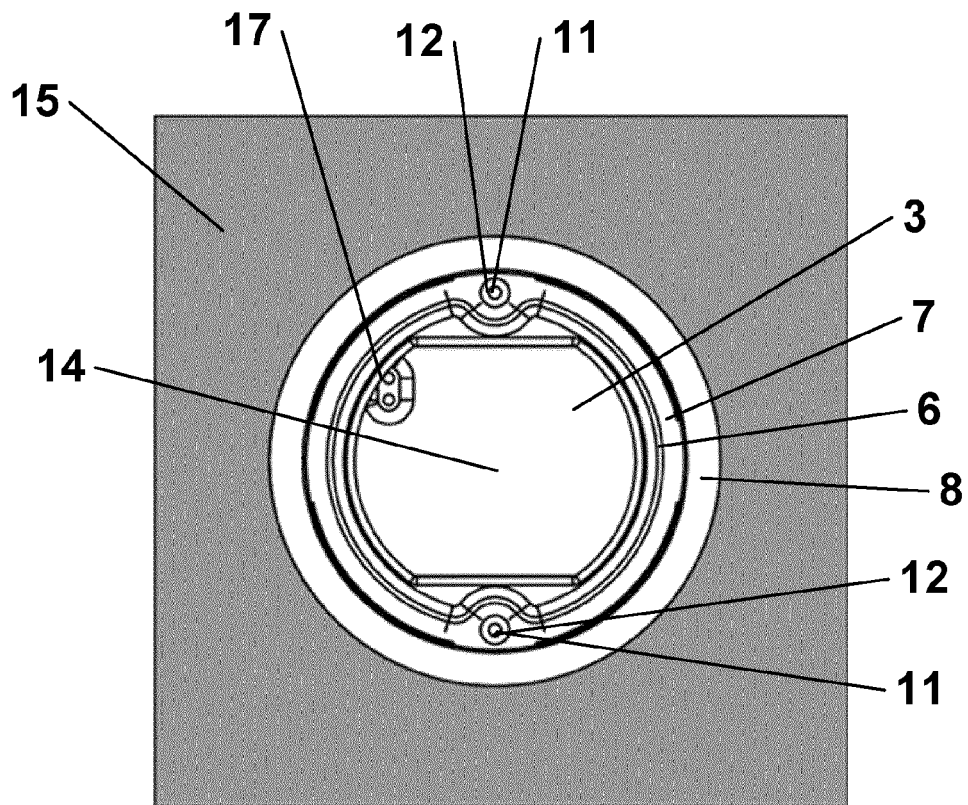
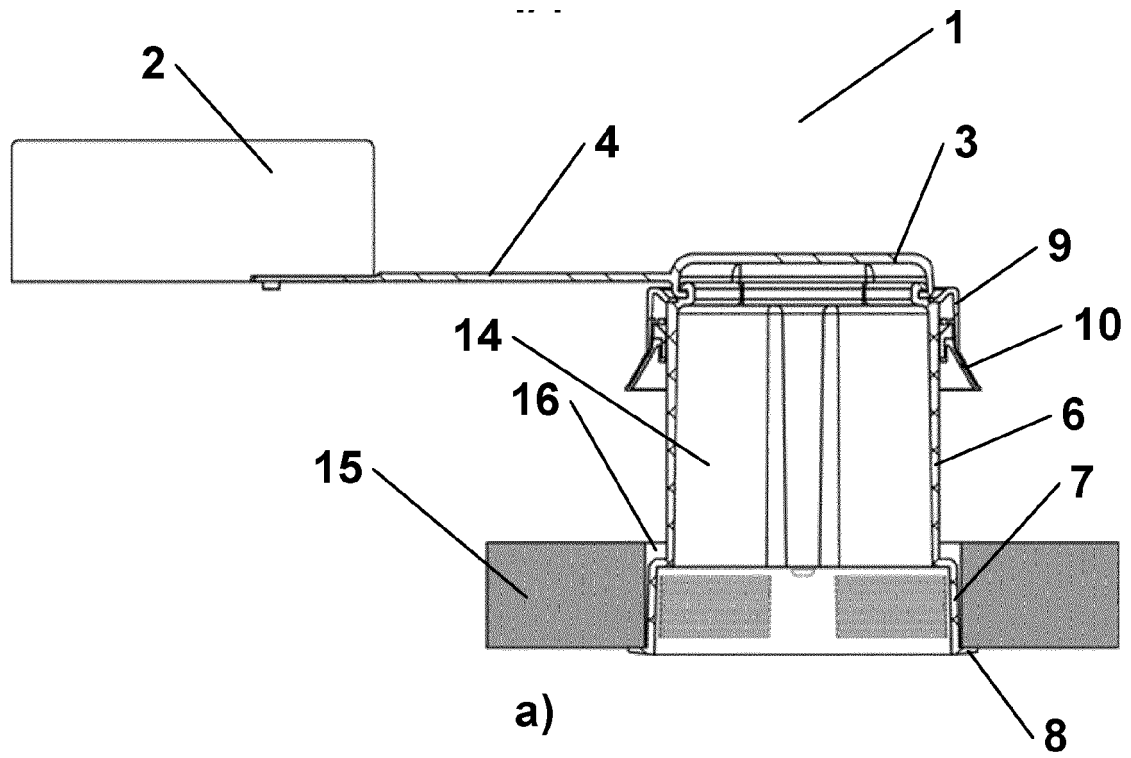


Fig. 4



EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	EP 2 818 796 A1 (BENJUMEA MANUEL [FR]) 31 December 2014 (2014-12-31) * paragraphs [0026] - [0036]; figures 1-2 *	1-5,7-10 6	INV. F21S8/02 F21V21/04 F21V31/00
X	US 2015/092416 A1 (POTUCEK KEVIN L [US] ET AL) 2 April 2015 (2015-04-02) * paragraphs [0024], [0031] - [0035]; figures 1-11 *	1-5,8,10	
X	US 2012/279746 A1 (GAGNE JEAN-GUY [CA] ET AL) 8 November 2012 (2012-11-08) * paragraphs [0059] - [0062]; figures 1a-1e *	1-5,7,8	
X	FR 2 595 133 A1 (SOUDURES APPLIC ELECTR [FR]) 4 September 1987 (1987-09-04) * the whole document *	1,3,4,7, 8,10	
X	JP 2010 010045 A (TOSHIBA LIGHTING & TECHNOLOGY) 14 January 2010 (2010-01-14) * paragraphs [0028] - [0047]; figures 1-5 *	1,3,4,7, 8,10	TECHNICAL FIELDS SEARCHED (IPC)
X	KR 101 855 361 B1 (COZYLED LTD [KR]) 8 May 2018 (2018-05-08) * paragraphs [0029] - [0063]; figures 1-9 *	1,3,5, 7-10	F21S F21V H02G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 July 2021	Examiner Thibaut, Arthur
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	

 1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 16 4894

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2818796 A1	31-12-2014	EP 2818796 A1	31-12-2014
		FR 3007508 A1	26-12-2014
US 2015092416 A1	02-04-2015	CA 2925701 A1	02-04-2015
		EP 3049718 A1	03-08-2016
		ES 2750271 T3	25-03-2020
		US 2015092416 A1	02-04-2015
		US 2018202645 A1	19-07-2018
		WO 2015048656 A1	02-04-2015
US 2012279746 A1	08-11-2012	US 2012279746 A1	08-11-2012
		WO 2012151664 A1	15-11-2012
FR 2595133 A1	04-09-1987	NONE	
JP 2010010045 A	14-01-2010	NONE	
KR 101855361 B1	08-05-2018	NONE	