

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**22.06.2022 Bulletin 2022/25**

(51) International Patent Classification (IPC):  
**F21V 21/04**<sup>(2006.01)</sup>      **F21S 8/02**<sup>(2006.01)</sup>

(21) Application number: **21214573.4**

(52) Cooperative Patent Classification (CPC):  
**F21V 21/042; F21S 8/026**

(22) Date of filing: 14.12.2021

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
 GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO  
 PL PT RO RS SE SI SK SM TR**  
 Designated Extension States:  
**BA ME**  
 Designated Validation States:  
**KH MA MD TN**

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(30) Priority: 15.12.2020 DK BA202000133 U

(54) **LIGHTING FITTING WITH STRIPS FOR ASSEMBLY AND DISASSEMBLY**

(57) A light fitting (830) is presented for installation in a panel (822) where the light fitting comprises a box (820) comprising of a cavity (832) arranged to encircle a light source, where the light fitting is arranged in such a way that the light source can be accessed from a first side (834) of the panel after installation, a ratchet comprising a cable tie (838) and a ratchet mechanism (840) arranged to prevent a relative movement between the cable tie and a part of the light fitting, such as the remaining part of the light fitting that does not cover the cable tie in at least one direction, a primary flange arrangement (842) to sit flush against a first side of the panel, a sec-

ondary flange arrangement (844) to sit flush against a second side of the panel, where a distance (846) between the primary flange arrangement and the secondary flange arrangement can be reduced by means of the ratchet and/or where the light fitting can be installed in the panel as a result of the ratchet mechanism locking the relative distance between the primary flange arrangement and the secondary flange arrangement and where the light fitting is arranged in such a way that a tensioned part of the cable tie is accessible from a first side of the panel after installation.

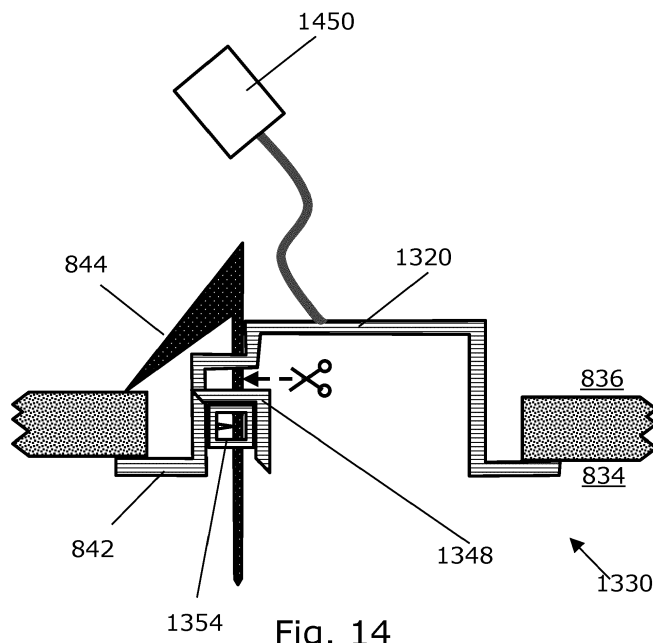


Fig. 14

**Description**

and/or

## SCOPE OF THE INVENTION

**[0001]** The present invention concerns a light fitting and, more specifically, a light fitting with a cable tie for installation and removal and also concerns a lamp, a construction element and the use of these.

- where the light fitting can be installed in the panel through the ratchet mechanism locking the relative distance between the primary flange arrangement and the secondary flange arrangement,

## BACKGROUND TO THE INVENTION

**[0002]** The installation of light fittings in panels is familiar. The fact that the time spent on installation is longer than desirable may be impractical. It may also be impractical that the time spent on removal may be longer than desirable and/or that (specific) parts of the light fitting, such as a cup and/or panel in which the light fitting is installed need to be damaged while being removed in order to complete the removal.

and where the light fitting is arranged in such a way that a tensioned part of the cable tie is accessible from a first side of the panel after installation.

## BRIEF DESCRIPTION OF THE INVENTION

**[0003]** The purpose of the present invention is to provide a light fitting that can be installed in a (relatively) short time and/or can be removed without a cup needing to be damaged during removal.

**[0005]** An advantage of the invention may be that it is possible to install the light fitting in a panel quickly and/or by simple means. For example, it may be possible to position the light fitting with the primary flange arrangement on a first side of the panel and the secondary flange arrangement on the other side of the panel and, by means of the ratchet, reduce the distance between the primary flange arrangement and the secondary flange arrangement until the flanges are flush with the first and second sides of the panel respectively and thereby grip the panel and secure the light fitting in a fixed position in relation to the panel. It may therefore be possible to install the light fitting by only using the ratchet.

**[0004]** The first aspect of the invention concerns a light fitting for installation in a panel, with the light fitting comprising:

**[0006]** Another possible advantage of the invention could be that it is possible to remove the light fitting quickly and/or by simple means. For example, it could be possible to access a tensioned part of the cable tie from the first side of the panel (i.e., the same side as the side from which the light source can be accessed) and, for example, break the tension by cutting or shearing or melting the cable tie so that the primary and secondary flange arrangements and secondary flange arrangement are no longer secured in a locked condition that grips the panel whereby the light fitting can be dismantled or removed from the panel. It could be seen as an advantage that the tensioned part of the cable tie can be accessed from the first side of the panel because it is then not necessary to gain access to the second side of the panel (which could, for example, be from the ceiling side of a ceiling covering) and/or the fact that it is not necessary to carry out a destructive encroachment on the box. It could therefore be possible to remove the light fitting from the panel, e.g., in order to access the electrical connector positioned outside the box on the other side of the panel without destroying the box, which can thus be re-installed, e.g., using a new cable tie.

- a box comprising a cavity arranged to encircle a light source (such as where the cavity encircles a lamp holder for a light source) where the light fitting is arranged in such a way that the light source (and/or lamp socket) can be accessed from a first side of the panel after installation,
- a ratchet comprising of:
  - i. a cable tie, and
  - ii. a ratchet mechanism arranged so as to prevent a relative movement between
    - 1. the cable tie, and
    - 2. a part of the light fitting, such as the remaining part of the light fitting, that does not comprise the cable tie in at least one direction,
- a primary flange arrangement to sit flush against a first side of the panel,
- a secondary flange arrangement to sit flush against a second side of the panel,

where

**[0007]** The term "light fitting" is to be understood as meaning a supporting structure for facilitating a fixed structural, and optionally electrical, connection between, on the one hand a structural element and a possible electrical installation and, on the other hand, a light source, e.g., where the light fitting includes a holder (e.g., including a lamp holder) that can be installed in a structural element and to which an electrical connection may be connected and where a light source (e.g., an LED light source or a light bulb, such as a filament bulb or a gas discharge lamp) can be inserted in a relationship, such as a fixed relationship (i.e., without translational degrees

- a distance between the primary flange arrangement and the secondary flange arrangement can be reduced via the ratchet,

of freedom) to the light fitting and structural element. In relation to a lamp, the light fitting could optionally have the meaning of the parts that correspond to the lamp without the light source.

**[0008]** The term "installation in a panel" is to be understood as meaning, for example, installation in a cavity (e.g., a tight-fitting cavity in relation to the light fitting) in a panel, such as a panel with a thickness comparable with or less thick than the length of the light fitting (along an optical axis of the light fitting).

**[0009]** The term "panel" is to be understood as having the meaning it normally has in the field of technology, for example, generally as a thin (such as in a thickness that is less, such as in considerably less, than the length and width), large (such as in length and width, such as in considerably bigger, than the length and width of the light fitting, e.g., in directions at a right angle in an optical axis of the light fitting), and possibly flat, such as a first side of the panel and a second side of the panel each being separately flat and parallel, e.g., at least in the area around the light fitting. This could also mean that the panel is not flexible (such as in rigid) relative to the influence of the light fitting.

**[0010]** The term "box" is understood to have the meaning of an element, such as a shell, comprising a cavity arranged to enclose a light source, e.g., a box comprising a lamp holder for the insertion of a light source. Some embodiments of the box could be monolithic.

**[0011]** The term, "light source" can mean an electric light source, such as an LED ("light emitting diode") light source and/or an electric light source with a base or a socket, such as an LED light source with a so-called GU10 base. The light source may be partly conical where the surface through which the light can be emitted matches the circular end face of the cone. Generally speaking, the light source may have an essentially flat surface, such as a circular end face, through which light can be emitted where the flat surface has an extent such as a diameter of, for example 10 mm, 25 mm, 50 mm or 100 mm. Alternatively, the light source has a circular symmetrical cut edge (which may be flush with a circular flange). In specific embodiments, the light source is partly cone shaped and light is emitted through the circular end face of the cone, which has a diameter of 10 mm, 25 mm, 50 mm or 100 mm.

**[0012]** The term, "base" shall be understood as meaning part of the light source that is arranged to form part of a fixed connection with a lamp holder (e.g., a GU10 base on a GU10 light source that fits a GU10 lamp holder in a light fitting).

**[0013]** The term, "where the light fitting is arranged in such a way that the light source can be accessed from a first side of the panel after installation" can mean that, following the installation of the light fitting in a panel, e.g., in a cavity in the panel that closes tightly around the light fitting (so that one does not have access the opposite side of the panel via a passage between light fitting and panel) and where the panel is - in principal - big enough

(length and breadth) or infinite so that there is no access to the other side of the panel via a passage around the panel), the light source can be accessed and, for example, be replaced from a first side of the panel as well as only from a first side of the panel. The light fitting may, for example, be connected electrically to an electricity network via an electrical connector placed on the other side of the box in relation to the light source. This could, for example, involve the panel being in a ceiling panel and the light fitting being installed in the ceiling panel from which light is arranged to emit downwards and where there is still access to the light source from the underside of the ceiling panel so that it is still possible after installation of the light fitting to access and, for example, replace the light source from the front and/or underside of the ceiling panel.

**[0014]** The term "ratchet" is understood to have the meaning of a device consisting of a cable tie with a surface (e.g., with teeth, such as in asymmetrical teeth or barbs) arranged in relation to a detent so that the cable tie can be moved in one direction past the detent (which has a "freewheel" in one direction) but not in the opposite direction or can only be moved in the opposite direction with more force than the force required to retain the light fitting in the panel (e.g., so that, for example, the effect of the gravitational force on the light fitting is less than the force required in order to move the cable tie in the other direction). In principle, it is possible that the force used in moving the cable tie in the first direction is just as great or greater than the force that makes it possible to move the cable tie in the other direction. One advantage in installation by means of a ratchet could be that there will be a greater span of panel thicknesses that can be installed, such as in as relatively greater (e.g., compared with installation using a screw where, for example, the height/length of the thread imposes a restriction).

**[0015]** In one embodiment, greater force will be required to move the cable tie in a direction other than the first (where the other direction is the direction in which the primary and secondary flange arrangements are moved from each other. This could have the advantage of it being relatively easy to install the light fitting while it is subsequently still fixed securely.

**[0016]** The term "cable tie" is understood as having its usual meaning in the field of technology, a longish item that can function in a ratchet, e.g., by means of teeth or asymmetrical teeth or barbs. This is an assumption and subject to it being possible to have one or more cable ties, and this particularly comprises that there can be several cable ties, such as 2, 3, 4, 6, 8, 12 or more cable ties and further understood to have the meaning that there can be an equivalent number of ratchets. The preferred embodiments have 2 or more cable ties.

**[0017]** In embodiments with several cable ties, the extra cable ties can be distributed with equidistant spacing in terms of angles, e.g., 180° between two cable ties, 120° between the nearest cable ties in the case of three cable ties and generally 360°/n between the nearest ca-

ble tie in the case of n cable ties.

**[0018]** In embodiments with several cable ties in particular, it could be an advantage to be able to relatively easily (e.g., in relation to screws) see the position of the cable tie during installation because part of the cable tie on one side of the ratchet may be visible from a first side of the panel and the length of this part makes it possible to assess the position of the cable tie. If there are more cable ties, this could lead to the advantage that one can relatively easily (e.g., in relation to screws) assess whether all cable ties are in the same position (and, for example, equally tensioned).

**[0019]** In embodiments, there are one or more length markings on the cable tie (or on one or more or each cable tie in the case of several cable ties). One advantage with this is that it will therefore be easier and/or possible to assess matters more precisely and potentially even quantify the position of each individual cable tie.

**[0020]** The term, "ratchet mechanism" is understood to have the meaning of the arrangement that makes it possible to allow the cable tie to move in one direction but not the other or only in the other direction when subjected to the aforementioned force, e.g., the part or area of the device in which cable tie and detent interact.

**[0021]** The term "arranged so as to prevent a relative movement between the cable tie and a part of the light fitting, such as the remaining part of the light fitting that does not cover the cable tie in at least one direction" is understood to have the meaning of the force required to move the cable tie in the other direction being greater than the force required to retain the light fitting in the panel (e.g., so that the effect of gravity on the light fitting is less than the force required to move the cable tie the other way).

**[0022]** The term, "flange arrangement" is understood to have the meaning of a flange arrangement comprising a flange such as a flange that entirely or partially covers the box or one or more primary flange components, such as taps or suchlike that can have the same function as a flange, such as a function where they can be flush with the first or second side of the panel and thereby ensure that the light fitting cannot be moved further in a direction at right angles to the panel.

**[0023]** The terms "flange" or "flange component" generally mean a prominent edge or joint, such as a prominent edge on a cylindrical item.

**[0024]** A distance between the primary flange arrangement and the secondary flange arrangement can be reduced by means of the ratchet, e.g., through the primary flange arrangement being positioned on the box and the secondary flange arrangement being positioned on the cable tie and where the cable tie can be moved in one direction (such as a direction parallel with an optical axis for the light fitting and/or parallel with the panel comparison specimen) by means of the ratchet mechanism so that the primary and secondary flange arrangements move towards each other. The installation can be by means of the box's (primary) ratchet arrangement being

initially positioned on the first side of the panel and the cable tie's (secondary) ratchet arrangement being positioned on the other side of the panel and them being moved towards each other and at one time being positioned against each side of the panel and pressed securely around the panel.

**[0025]** Since the cable tie will only be able to be moved in the other direction (if it can be moved in the other direction) when subject to great force, the light fitting can be installed in the panel using a ratchet that will lock the relative distance between the primary flange arrangement and the secondary flange arrangement.

**[0026]** The term "tensioned part of the cable tie" is understood to mean the part of the cable tie that is tensioned following installation and that thereby holds the primary and secondary flange arrangement at a limited and/or locked distance and thereby holds the light fitting securely. The tensioned part could, for example be a part of the cable tie between a flange arrangement on the cable tie and the ratchet mechanism/detent.

**[0027]** The term, "where the light fitting is arranged in such a way that a tensioned part of the cable tie is accessible from a first side of the panel after installation" can mean that, following the installation of the light fitting in a panel, e.g., in a cavity in the panel that closes tightly around the light fitting (so that one does not have access to the opposite side of the panel via a passage between light fitting and panel) and where the panel is - in principal - big enough (length and breadth) or infinite so that there is no access to the other side of the panel via a passage around the panel), a tensioned part of the cable tie can be accessed (the tension can be broken (as discussed above)) from a first side of the panel. This could, for example, be a case of the panel being a ceiling panel and the light fitting being installed in the ceiling panel from where light is arranged to shine down the way (and where there is still access to the light source from a first/underside of the ceiling panel) so that, after installation of the light fitting, it is still possible to access the tensioned part of the cable tie from the first side/underside insofar as practically possible with a view to breaking the tension. The light fitting could, for example, be electrically connected to an electricity network by means of an electrical connector positioned on the other side of the box in relation to the light source and it may be necessary to access the connector from the first side (while a destructive encroachment may be necessary on the ceiling panel to reach from the other side) and embodiments of the invention offer this opportunity without it being necessary to carry out a destructive encroachment on either the box or ceiling panel because the tensioned part of the cable tie can be accessed from the first side.

**[0028]** According to one embodiment, a light fitting is presented where the light fitting also comprises a sealing element. A sealing element is understood to mean an element or possibly a collection of sub elements that can be positioned in relation to the light fitting and panel in such a way that it seals an opening between the panel

and lighting element, e.g., so that less air and/or moisture can pass between the panel and the lighting element after installation. The term "seals an opening between the panel and lighting element" is understood to mean that less air and/or moisture can pass through the opening after installation, but not necessarily that the sealing element is in the actual opening (this may also be positioned on one side or the other).

**[0029]** A sealing element may, for example, be made up of an element that covers the box in a way that it tightly covers the box. The material for the sealing element may be relatively less rigid (i.e., have a lower Young's modulus) than the material from which the box is made. One advantage of this may be that this can more easily be fitted tightly to the panel where the lower Young's modulus could make the sealing element adjust to any distortion and irregularities and tightly sealed despite any such distortions and irregularities. The sealing element can, for example, be performed entirely or partly from polymer (such as ethylenepropylene-diene-monomer (EPDM), silicone, neoprene and/or polychloroprene, which is a polymer material containing gas bubbles), and/or rubber (such as ethylene-propylene-diene-monomer (EPDM), neoprene and/or polychloroprene, such as a rubber material containing gas bubbles), such as natural rubber or synthetic rubber.

**[0030]** The sealing element may have a pattern, such as a honeycomb or waffle pattern and/or a corrugated surface (which may be preferable for increased strength).

**[0031]** According to one embodiment, a light fitting is presented where the sealing element is arranged in such a way that part of the sealing element or entire sealing element can be shifted in relation to the box (such as in shifted in a direction parallel with a direction corresponding to the difference when a distance between the primary flange arrangement and the secondary flange arrangement is reduced by means of the ratchet), possibly under the influence of the ratchet (so that the light fitting can be arranged in such a way than when a distance between the primary flange arrangement and the secondary flange arrangement is reduced by means of the ratchet, the sealing element can also be shifted) so that the sealing element can, while being installed in the panel, be pressed against the panel and thereby put into a position where it seals an opening between the panel and the light fitting. An advantage with this could be that a better seal can also be achieved in an effective manner during installation.

**[0032]** According to one embodiment, a light fitting is presented where the light fitting is arranged in such a way that, during installation in the panel, fixing can take place by means of elements, such as the ratchet and primary flange arrangement and possibly at least part of the box, which is made from materials that have a higher, such as at least 1% higher, such as at least 10% higher, such as at least 50% higher, such as at least 100% higher, Young's modulus than the Young's modulus for the material from which the sealing element is made.

**[0033]** According to one embodiment a light fitting is presented where the light fitting is arranged in such a way that, during installation in the panel, fixing can take place exclusively by means of elements such as the ratchet and the primary flange arrangement and the secondary flange arrangement and possibly at least part of the box that is made from materials that have a higher, such as at least 1% higher, such as at least 10% higher, such as at least 50% higher, such as at least 100% higher Young's modulus than the Young's modulus for the material from which the sealing element is made. Here, "exclusively" can therefore mean that the light fitting will still be secured to the panel in a similar or same way even removing or releasing other elements, such as the sealing element. An advantage with this is that the installation is not restricted by the sealing element material. In order to achieve a secure installation, it may be appropriate to use relatively rigid materials while, in order to achieve a seal, it may be appropriate to use relatively less rigid materials and an advantage with this embodiment could be that it solves the trade-off it would otherwise be necessary to make with regard to the sealing element material. Another advantage could be that the sealing element material may change over time, such as in changing relatively quickly over time in relation to other materials (e.g., ratchet materials and the primary flange arrangement and the secondary flange arrangement and the box, which could be more rigid), which could have the consequence that, if the light fitting is installed structurally (and possibly exclusively) via the sealing element (e.g., to be understood to mean in a way that the sealing element is among the elements through which the force - that holds the light fitting secured to the panel - is transmitted, e.g., in such a way that if the sealing element was removed or released, the lighting element could no longer be secured in a similar or the same way), so the installation could become less secure relatively quickly.

**[0034]** According to one embodiment, a light fitting is presented where a distance between the primary flange arrangement and the secondary flange arrangement can be increased in a non-destructive manner. The term, "non-destructive" is understood to mean that the box is not damaged, in a way that no parts (or the cable tie) are damaged (where "damaged" is understood to mean that the function is retained). In one embodiment, the ratchet mechanism and/or the cable tie are arranged in such a way that it or they are accessible from the first side and in such a way that the contact between the cable tie and ratchet mechanism can be released from the first side. For example, a detent that catches with the cable tie can be used so that it is accessible from the first side and can be bent and/or shifted away from the cable tie. In an alternative embodiment, the cable tie can be bent and/or shifted away from the detent. In an alternative embodiment, a distance between the primary flange arrangement and the secondary flange arrangement can be increased without the ratchet being damaged, e.g., through the ratchet being arranged so that it can hold the weight

of the light fitting, while a greater force can result in a distance between the primary flange arrangement and the secondary flange arrangement being increased without the ratchet being thereby destroyed.

**[0035]** In an alternative embodiment, a connection between the box and a ratchet mechanism part is broken in a non-destructive manner, in a way where the box (and also the ratchet mechanism part, if applicable) is not damaged. The ratchet mechanism part can also be arranged in such a way in relation to the box that, when the connection is broken, the distance between the primary flange arrangement and the secondary flange arrangement can be increased (e.g., as a result of it being possible to insert the ratchet mechanism part through a cavity in the box). In one embodiment, such a reversible connection may be made up of a click-lock, such as a lock where a spring-loaded element in one part catches to an element (e.g., a cavity, an edge or a barb) on another part in such a way that the spring power keeps the spring-loaded element in a position where the two parts are locked in relation to each other and where the two parts can be separated if the spring power is overcome, e.g., by means of a click buckle or side-release buckle or a ball detent.

**[0036]** According to one embodiment, a light fitting is presented where a distance between the primary flange arrangement and the secondary flange arrangement can also be increased in a non-destructive manner and where this can be done through the catch between the cable tie and ratchet mechanism and/or a connection between the box and a ratchet mechanism part being released from the first side by means of a tool, such as pliers, a screwdriver, a circular, cylindrical element with a diameter of 1 mm or more, such as 2 mm or more, such as 5 mm or more, such as 10 mm or more (which could, for example, also make it possible to release by means of an ordinary finger, such as 20 mm or more. Alternatively, this may occur through the catch or connector (e.g., a connector in a click lock) being operated (e.g., opened or closed, if necessary) without using tools, e.g., where there are pins or suchlike that can be operated with one or more fingers on an ordinary hand.

**[0037]** According to one embodiment, a light fitting is presented where the light fitting contains a junction unit that comprises:

- one or more electronic components,
- one or more electrical terminals (such as one or more terminal connectors), and/or
- one or more electrical connectors

arranged in such a way that the junction unit is accessible from a second side, such as only from a second side (where a second side of the panel is to be understood to mean the opposite side from the first side of the panel from which the light source can be accessed) of the panel after installation.

**[0038]** The term "junction unit" is understood to have

its normal meaning in the field of technology, e.g., a unit in which electrical connections (wires) terminate and/or a unit in which one or more electronic components are gathered. The junction unit may, for example, be a junction box, connection box, distribution cabinet, conduit box, cable box, terminal box and/or a connector box.

**[0039]** The term "electronic components" can be understood to mean components that have electrical properties beyond conductive or isolating abilities, such as control electronics. The one or more electronic components may, for example, be one or more LED drivers, a transformer, a dimmer and/or a wireless communication unit (receiver and/or transmitter).

**[0040]** "Electrical terminals" are understood to have their normal meaning in the field of technology, e.g., terminal plugs, terminal connectors and/or terminal blocks. Alternatively, the designation IDC (insulation-displacement-connector) may be used.

**[0041]** The term "electrical connector" is understood to have the normal meaning in the field of technology, e.g., components used to connect and disconnect an electric device to a cable or another device.

**[0042]** The junction unit may, for example, be placed on the rear of the box in relation to a (front) side of the box where a lamp holder is placed. In the case of the junction unit that is (only) available from a second side of the panel, it could be an advantage that a tensioned part of the cable tie is accessible from a first side of the panel after installation in such a way that the installation is reversible (to be understood as meaning that the box must not be damaged during removal) because this makes it possible to access the junction unit after installation without damaging the box (or the panel, which could, for example, be a ceiling panel). The junction unit may be connected to the box by means of one or more cables.

**[0043]** According to one embodiment, a light fitting is presented where the box contains one (or more) openings, such as a through-going opening, that is arranged in such a way that, after installation, the opening is or could be positioned outside the tensioned part of the cable tie. A possible advantage of this is that it would be possible to insert a tool (e.g., a knife, scissors or an element that has been heated up to a temperature higher than the cable tie's melting point) through the opening (e.g., from the first side of the panel and/or from the cavity) and break the tensioned part of the cable tie. The phrase "positioned outside the tensioned part of the cable tie" can be understood to mean it being possible to access the tensioned part of the cable from a first side of the panel after installation via the opening, e.g., with a knife, scissors, heating element, etc. The phrase "positioned outside the tensioned part of the cable tie" can be understood to mean that a straight line can be drawn through the cavity and through the tensioned part of the cable tie.

**[0044]** According to one embodiment, a light fitting is presented where the light fitting contains a ratchet mechanism part that is separate from the box and where the

ratchet mechanism part is arranged in such a way that the ratchet mechanism part is accessible from a first side of the panel after installation and where the ratchet mechanism part may be replaceable. A possible advantage of this is that it may be possible to gain access to the ratchet mechanism part from a first side of the panel and/or from the cavity to break the tensioned part of the cable tie, possibly by means of a destructive encroachment on the ratchet mechanism part. It may subsequently be possible to re-use the box, where necessary with a new cable tie and/or ratchet mechanism part. The term "ratchet mechanism part" can be understood to mean a separate part containing a detent that can interact with the cable tie. During installation, the ratchet mechanism may be positioned inside the box, such as in a track (a longish groove) in the inner side of the box. Another possible advantage is that it is not necessary to have a through-going opening in the actual box in order to gain access to a tensioned part of the cable tie after installation (which is an advantage because the absence of such a through-going opening can increase the tight fitting of the light fitting, which to a greater extent prevents moisture and/or air entering from the second side of the panel to the second side of the panel after installation of the light fitting in the panel).

**[0045]** The term "separate (from the box)" can be understood to mean the ratchet mechanism part is not being integrated, such as in monolithically integrated, into the box and/or the ratchet mechanism part is not able to be separated from the box by means of a non-destructive action. The term "separate (from the box)" does not exclude the ratchet mechanism part being positioned beside the box in such a way that it is in physical contact with the box, at least while being used.

**[0046]** According to another embodiment, a light fitting is presented where the box is arranged in such a way that the ratchet mechanism part is flush with a surface inside the cavity on installation, such as in such a way that the ratchet mechanism part itself is entirely or partly inside the cavity on installation.

**[0047]** According to one embodiment, a light fitting is presented that furthermore comprises a lamp holder arranged for the insertion of the light source, where the lamp holder is placed in the cavity.

**[0048]** According to one embodiment, a light fitting is presented where the light fitting is a downlight light fitting. The term, "downlight", is generally to be understood as a lamp, such as a downlight lamp, that is suitable for installation in a surface, e.g., a ceiling or another surface with a comparison specimen that points down the way, such as in vertically downward. A downlight lamp may comprise a downlight light fitting (and possibly a downlight front) and a light source where the downlight light fitting is intended as a downlight lamp.

**[0049]** The term "downlight front" is to be understood to mean the part of a downlight lamp that constitutes the front, such as the part that is essentially flush with or is intended to be flush with the surface onto which the downlight it installed and/or forms the external surface follow-

ing installation. In embodiments, the downlight front is arranged in such a way that the light source may be (or is) installed reversibly or irreversibly on the downlight front.

**[0050]** According to one embodiment, a light fitting is presented, such as a downlight light fitting, comprising a front, such as a downlight front that comprises a flange, where a light source can be flush with the flange, where there are one or more cutouts in the part of the flange that the light source can be flush with and where one or more cutouts are arranged so that a light source can be flush with the flange (so a light source can be flush with the flange (such as a light source with a flat surface, where the flat surface of the light source can be flush with the flange) in such a way that there are one or more through-going openings between the flange and the light source (such as between the flange and the light source's flat surface).

**[0051]** An advantage with this embodiment is that, if liquid, such as water, penetrates inside the light fitting or an equivalent lamp (i.e., a lamp equivalent to the light fitting and a light source inserted in the light fitting) with a front according to the embodiment (i.e., in a volume that lies above the light source and flange when the lamp is installed so that the light source can shine down the way), then the water will be able to pass out (down) through the through-going openings. A possible advantage of this is that there will be water and moisture in the lamp for a shorter period of time. A possible related advantage of this is that the liquid and moisture cannot cause damage and/or a better IP code can be achieved. Another possible advantage is that the invention manages in a relatively simple manner to prevent liquids and moisture from causing damage and a better IP code can be achieved.

**[0052]** In embodiments, the flange is part of a holder that is covered by the (downlight) front where the holder is intended to secure, such as securing (reversibly or irreversibly, i.e., replaceable or non-replaceable) against movement relative to the (downlight) front in all three spatial dimensions (and more specifically securing against movement in both directions in each of the three dimensions), a light source, such as an electrical LED light source (e.g., with a GU10 base). The holder may also enclose a springy element for reversible installation and removal of the light source.

**[0053]** The front, such as the downlight front, as a light source can be flush with an inner flange. The term inner flange can also be understood to mean a flange that is found on the inner side of an item, such as a cylindrical item, such as the inner side of a circular cylindrical pipe. This is also understood to mean that an inner flange has a through-going opening in the middle (through which the light from the light source's end flange can be emitted).

**[0054]** The term, "cutout" is understood to mean grooves or cavities, such as through-going or non-through-going grooves or cavities. It is furthermore un-

derstood to mean that cutouts also comprise "projections" in the area at the side of and/or between projections being regarded as one or more cut outs. The cutouts mean that the flange in its entirety is not symmetrical in terms of circular rotation (where "symmetrical in terms of circular rotation" is understood to mean n-fold rotational symmetrical with  $n = \infty$ ).

**[0055]** The term "through-going openings" is understood to mean that there will be an open passage from a point on one side of the system consisting of light source and flange to a point on the other side of the system referred to through one or more of the through-going openings.

**[0056]** In one embodiment, the cutouts are arranged in such a way that the one or more through-going openings between the flange and light source allow the passage of a liquid, such as water, such as water that it not carried by a pressure difference. Each of the one or more through-going openings may have a cross section big enough to cover a circle with a diameter of 1/10 mm, such as 2/10 mm, such as 5/10 mm, such as 1 mm. The passage of liquid may take place "passively", i.e., without force being applied, such as pressure. The passage of liquid may, for example, occur through being carried by surface forces and/or gravitational force. This could be regarded as a possible advantage, since water will, in this manner, be drained automatically and/or by itself from a (downlight) light fitting with a (downlight front) and a light source, such as from a "downlight) lamp.

**[0057]** In one embodiment, the cutouts are a distance between a flat surface flush with the flange and the furthest away point of the one or more cutouts is a minimum of 1/10 mm, such as a minimum of 2/10 mm, such as a minimum of 5/10 mm, such as a minimum of 1 mm. The distance referred to can also be called the "depth", such as in the depth/extent in a direction parallel with the comparison specimen of a surface flush with the flange.

**[0058]** In one embodiment, the flange is installed in the (downlight) front in such a way that the flange can be tipped (tilted) around an axis parallel with a surface, such as a ceiling into which the (downlight) lamp is installed during use), and where one or more of the one or more cutouts are found on the part of the flange against which the light source can be flush that is furthest away from the axis. The phrase "that is furthest away from the axis" can be understood to mean the furthest away 50% of the flange, the furthest away 25%, the furthest away 10% or the furthest away point (such as the furthest away point, or one or both of the furthest away points are located in part of the flange where there is a cutout). A possible advantage with this is that, when the flange is tilted, the furthest point/s will be positioned further down (towards the Earth's center of gravity) and any water will subsequently be carried to the point/s where the flange is tilted and it could therefore be advantageous that there is a cutout exactly here (and thereby a through-going opening) through which water can pass, such as in pass down through and out of the lamp.

**[0059]** In one embodiment, the cutouts are an inner diameter of the flange less than 50 mm, such as 49 mm or less, such as 46 mm or less, and where an outer diameter of the flange is 50 mm or greater, such as greater than 50 mm, such as 51 mm or greater. This is understood to mean that the flange needs to be circular but, if the flange is not circular, the term, "diameter" shall be understood to mean "minimum distance flange-flange through the center of the flange". A possible advantage of this is that the flange will therefore be suitable for light sources with a circular end panel with a diameter of 50 mm (such as is typically the case with GU10 light sources) to be positioned flush with the flange. Light emitted through the end face can thus also be emitted through (the cavity in) the flange.

**[0060]** In one embodiment, the one or more cutouts that are not through-going. Non-through-going is understood to mean that the cutout has non-through-going cavities, i.e., the cutouts do not go all the way through the flange in a direction along a comparison surface for a surface that is flush with the flange. A possible advantage of this is that the opposite side of the flange (in relation to the side the light source can be flush with and where there are one or more cutouts) may be level (without cavities/cutouts), which makes the surface treatment, painting, lacquering, and/or cleaning easier. In one embodiment, one side of the flange is symmetrical in terms of circular rotation. The side referred to (symmetrical in terms of circular rotation) is understood to mean the side opposite the side the light source may be flush against and where there are one or more cutouts.

**[0061]** According to one embodiment, a light fitting is presented that also comprises one or more additional fixing elements, such as fixing elements based on one or more screws and/or springs, such as leaf springs (corresponding to the principle shown for the front in Figs. 1-6.). One advantage from this is that this makes it possible to install the light fitting by means of the most appropriate installation method. For example, cable ties and/or springs can be used in a situation where big loads are not expected and a quick and/or easy installation is preferred, while screws (that may need to resist great forces) can be used when an installation that can resist greater forces is deemed necessary. It could thus be an advantage that only one type of light fitting needs to be produced for installation in several different ways. It could also be an advantage that it is subsequently not necessary to keep several type types of light fittings in stock. It could also be an advantage that, for example, during installation, one can choose between different installation methods on site without needing to replace the light fitting, depending on the installation method chosen.

**[0062]** In a second aspect, the invention concerns a lamp, comprising a light fitting according to the first aspect and optionally a lamp front, such as where the light source is installed in the light fitting and is flush with the flange in such a way that there are one or more through-going openings between the flange and the light source.

**[0063]** According to one embodiment, a lamp that fulfils the criteria for the IP code IP44 or better is presented, such as IP code IP65 or better. The IP code is understood to mean a protection class *Degrees of protection provided by enclosures (IP Code)*, such as the IP code as defined in IEC 60529, such as the IP code defined in IEC 60529 and/or such as the applicable equivalent standard in Denmark as at 30/04/2019, such as DS/EN 60529+A1:2002, including all additions and corrections up to and including 30/04/2019. In this context "or better" is understood to mean that the first and/or second number (in the IP Code) is higher.

**[0064]** In a third aspect, the invention concerns a structural element (e.g., a ceiling or underside of a built-in cabinet), such as a construction element, such as a cladding component, comprising:

- the panel, and
- a light fitting according to the first aspect or the lamp according to the second aspect.

**[0065]** According to one embodiment, a construction element is presented in which a light fitting is installed according to the first aspect, such as a downlight fitting and a downlight front, such as where the downlight fitting is installed so that the surface of the downlight front is flush with the surface (or, more specifically, the underside) of the construction element and where the surface of the construction element has a comparison specimen where the smallest angle with the gravitational force is less than 90°, such as parallel with the gravitational force.

**[0066]** In a fourth aspect, the invention concerns a use of the light fitting according to the first aspect, the lamp according to the second aspect or a structural element according to the third aspect to secure or partly secure a light source.

**[0067]** According to one embodiment, a use is presented where the light fitting (100) according to the first aspect, the lamp according to the second aspect or a structural element according to the third aspect is used to provide light.

**[0068]** According to one embodiment, a use of a (downlight) light fitting with a (downlight) front is presented according to the first aspect in order to secure or partly secure a light source, where the (downlight) front prevents the movement of the light source in one direction in one dimension, such as vertically downward as a result of the light source being flush with the flange, where there are one or more through-going openings between the flange and the light source.

**[0069]** In one embodiment, use where the system consisting of the (downlight) front and light source is provided to drain liquid from one side of the one or more through-going opening/s to the other side of the one or more through-going openings, through the liquid passing the one or more through-going openings, such as where there is no pressure above the through-going openings.

**[0070]** In a fifth aspect, the invention concerns a pro-

cedure for installing a light fitting according to the first aspect, where the procedure comprises a distance between the primary flange arrangement and the secondary flange arrangement being reduced by means of the ratchet and where the light fitting is installed in the panel by means of the ratchet device locking the relative distance between the primary flange arrangement and the secondary flange arrangement and where the light fitting is arranged in such a way that a tensioned part of the cable tie is accessible from a first side of the panel after installation.

**[0071]** In a sixth aspect, the invention concerns a procedure for removing a light fitting according to the first aspect, where the light fitting is installed in the panel and where the procedure comprises a tensioned part of the cable tie being accessed and broken from a first side of the panel and/or a distance (846) between the primary flange arrangement and the secondary flange arrangement being increased in a non-destructive manner.

**[0072]** The first, second, third, fourth, fifth and sixth aspects of the present invention may each be combined separately with any one of the other aspects. These and other aspects of the invention will be described and exemplified with reference to the embodiments described below.

## BRIEF DESCRIPTION OF THE FIGURES

**[0073]** The light fitting, lamp, structural element, use and the method according to the invention are described below in greater detail with reference to the figures.

Fig. 1 shows a line drawing of a downlight front 100.

Fig. 2 shows a line drawing of the downlight front 100 seen from above.

Fig. 3 shows a line drawing of the downlight front 100 seen from the side.

Fig. 4 shows a line drawing of the downlight front 100 seen from below and from the side.

Fig. 5 shows a line drawing of the downlight front 100 seen from above and from the side.

Fig. 6 shows a line drawing of the downlight front 100 seen from above and from the side.

Fig. 7 shows a diagram of a cross section.

Fig. 8 shows an implementation of the invention.

Fig. 9 shows the situation where the light fitting has been partially inserted through the cavity.

Fig. 10 shows that the cable tie has been moved down the way through the ratchet mechanism.

Fig. 11 indicates that the tensioned part of the cable tie can be broken.

Fig. 12 shows a situation where the tensioned part of the cable tie is broken.

Fig. 13 shows an alternative embodiment of a light fitting.

Fig. 14 shows an electrical connector.

Fig. 15 shows an alternative embodiment of a light fitting.

Fig. 16 shows a light fitting with a sealing element. Fig. 17 shows the light fitting as in Fig. 16, but with the sealing element shifted.

Fig. 18 shows the light fitting as in Figs. 16-17 installed in a panel.

Fig. 19 shows the light fitting as in Fig. 18 from a different angle.

Fig. 20 shows (A) an embodiment of a light fitting with two cable ties and (B) an embodiment of a light fitting with two cable ties and a sealing element.

Fig. 21 shows an alternative embodiment of a light fitting.

Fig. 22 shows a removal of the light fitting in Fig. 21.

## DETAILED DESCRIPTION OF THE INVENTION

**[0074]** Embodiments of the invention will now be described further with reference to the appended figures.

**[0075]** Fig. 1 shows a line drawing of a downlight front 100 seen in perspective from above and from the side. More specifically, the figure shows a downlight front 100 that comprises a flange 102, where a light source can be flush with the flange, where there are two (only one cutout 104 visible in Fig. 1) in the part of the flange the light source can be flush with and where the one or more cutouts are arranged so that a light source can be flush against the flange in such a way that there are one or more through-going openings between the flange and the light source. The figure also shows a circularly symmetrical wall 106 which, together with the flange 102 forms a holder with a cavity that can secure a conical light source (such as a typical electrical LED light source, e.g., with a GU10 base) in the directions downwards and to all sides. The flange 104 is an inner flange that is turned inwards from wall 106. By virtue of the cavity in the middle of the flange, light from the light source can be emitted downwards through the holder. Furthermore, the springy elements are shown in the form of metallic elements 108 where the light source can be secured in a reversible manner against upward movement. Furthermore, Fig. 1 shows an outer flange 110 which can be flush against a downlight box (where "box" can be confused with "can") and springy elements 112 that can secure the downlight front (against gravitational force) by securing to a downlight box.

**[0076]** The directions "from above", "from the side" and "from below" mean directions in the way the professional would understand them if the downlight front is installed in a lamp on a flat surface with the comparison specimen vertically downwards and where the lamp is intended to shine downwards (possibly at an angle in relation to vertically downward if the downlight front is tilted).

**[0077]** Fig. 2 shows a line drawing of the downlight front 100 seen from above, i.e., from a point above the ceiling if the downlight front is installed in a ceiling. In Fig. 2, two cutouts 104 are visible in flange 102.

**[0078]** Fig. 3 shows a line drawing of the downlight front 100 seen from the side.

**[0079]** Fig. 4 shows a line drawing of downlight front 100 seen from below and from the side, i.e., from a point under the ceiling and thus the drawing shows downlight front 100 from a view an observer could have after installation (but without the light source being shown). Cutout 104 is visible from this angle but will not be visible from a vertical angle from below (corresponding to a view from the other side of the paper in Fig. 2) since cutouts 104 are not through-going.

**[0080]** Fig. 5 shows a line drawing of the downlight front 100 seen from above and from the side, where flange 102 is tilted to one side.

**[0081]** Fig. 6 shows a line drawing of downlight front 100 seen from above and from the side, where flange 102 is tilted to one side (in relation to Fig. 5).

**[0082]** Figs. 5-6 thus show that the flange can be tilted around an axis and where both cutouts are located on the part of the flange against which the light source may be flush, which is furthest away from the axis. More specifically, the axis is located in such a way that a projection of the axis down on the flange's surface splits the flange into two equally sized circular halves and the cutouts are positioned at the top point, i.e., the furthest possible point in relation to the axis of each of the two parts. Liquid that has entered the cavity formed by wall 106 and flange 102 will, when tilted, be carried away from the axis due to gravitational force and down towards one or the other cutout, from which it can be drained away via the through-going opening between the flange and light source corresponding to the cutout.

**[0083]** Fig. 7 shows a diagram of a cross section straight through an example that could be relevant to the understanding of embodiments of the invention and shows, in a more specific manner, a downlight lamp 726 seen from the side and installed in a construction element 722. The drawing shows downlight front 700 with (an inner) flange 702 with cutouts 704 and (an outer) flange 710. Downlight front 700 can be tilted around axis 728 (note that, in this embodiment, cutouts are in the same cross section as axis 728). Downlight front 700 is installed in a downlight box 720 that is then installed in construction element 722. The drawing furthermore shows a light source 718 in the form of a conical electrical LED light source with a GU10 base in the top 719 (base not shown). Light source 718 is secured by springy metal cable ties 708. The gravitational force is directed down the way as indicated by arrow 724. Flange 702 has an inner diameter 714 that is 43 mm and an outer diameter 716 that is 50 mm. A distance 712 between a flat surface such as the underside of light source 718 that is flush with flange 702 and the furthest away point of the one or more cutouts is 0.5 mm. Cutouts 704 are arranged in such a way that the one or more through-going openings between the flange and light source allow the passage of a liquid, as indicated by the dotted arrows.

**[0084]** In Fig. 7, a light source 718 is secured where the downlight front 700 prevents movement of the light source downward 724 as a result of the light source being

flush with flange 702, where there are one or more through-going openings between the flange and the light source. In Fig. 7, liquid is drained from one side of the one or more through-going openings (the side that is above flange 702) to the other side (the side that is under flange 702) of the one or more through-going openings by means of the liquid passing through the one or more through-going openings (as indicated by the dotted arrows).

**[0085]** Fig. 8 shows an implementation of the invention and, more specifically, a light fitting 830 for installation in a panel 822, such as a panel with a cavity 850, where the light fitting comprises:

- a box 820 comprising of a cavity 832 arranged to encircle a light source (not shown) where the light fitting is arranged in such a way that the light source can be accessed from a first side 834 of the panel, such as the underside in the drawing shown, after installation.
- a ratchet comprising:
  - i. a cable tie 838 (where there are teeth on the left-hand side, which are not shown), and
  - ii. a ratchet mechanism 840 (with a detent 841) arranged so as to prevent a relative movement between
    - 1. the cable tie, and
    - 2. a part of the light fitting, such as the remaining part of the light fitting that does not cover the cable tie in at least one direction,
- a primary flange arrangement 842 that could be a circular flange the entire way (360°) around the box, to be flush with a first side of the panel,
- a secondary flange arrangement 844 to sit flush against a second side of the panel,

where

- a distance 846 between the primary flange arrangement and the secondary flange arrangement can be reduced by means of the ratchet.

and/or

- where the light fitting can be installed in the panel through the ratchet mechanism locking the relative distance between the primary flange arrangement and the secondary flange arrangement,

and where the light fitting is arranged in such a way that a tensioned part of the cable tie is accessible from a first side of the panel after installation.

**[0086]** The cable tie is (made of) flexible material in such a way that it can be bent (as indicated by the two-way arrow) when the light fitting needs to go through the

opening in the panel. In Fig. 8, the light fitting is shown with 1 cable tie, while in a preferred embodiment there are at least 2 cable ties, such as the cable tie shown on the left-hand side and a second cable tie on the right-hand side, such as the two cable ties being positioned each on their own side, such as in positioned 180 degrees between them and/or as far from each other as possible. The possibility of 2 cable ties or more also applies to Figs. 9-15 and 21-22.

**[0087]** Light fitting 830 also contains an electrical connector (not shown in Fig. 8, but is arranged as shown in Fig. 14) arranged in such a way that the electrical connector is accessible (exclusively) from a second side of the panel after installation.

**[0088]** The box contains an opening 852, such as a through-going opening that is arranged in such a way that, after installation, the opening is or could be positioned outside the tensioned part of the cable tie.

**[0089]** In Fig. 8, light fitting 830 is shown below panel 822 and the arrow pointing vertically upward indicates that the light fitting can be inserted partially through cavity 850.

**[0090]** Fig. 9 shows the situation where the light fitting is inserted partially through the cavity so that the primary flange arrangement 842 is flush against the (under-) side of panel 822.

**[0091]** Fig. 10 shows that the cable tie has been moved downward through the ratchet mechanism in such a way that the flange arrangements 842, 844 have become closer to each other and are flush against each side of the panel (on first side 834 and second side 836 of the panel respectively) and - by virtue of the ratchet - lock the light fitting securely in relation to the panel.

**[0092]** In Fig. 11 the scissors indicate that the tensioned part of the cable tie - between the secondary flange arrangement 844 and ratchet mechanism 840 - can be broken, such as cut across via the access through opening 852 from a first side of the panel (where it is understood that even if opening 852 is in principle on the other side of the panel, the opening - and thereby the tensioned part of the cable tie - can be accessed from the first side of the panel through the cavity).

**[0093]** Fig. 12 shows a situation where the tensioned part of the cable tie is broken and the light fitting is therefore no longer secured and can be removed (as indicated by the arrow pointing downward), e.g., in connection with access being desired to a connector on the rear of the box in relation to the cavity.

**[0094]** Fig. 13 shows an alternative embodiment of a light fitting 1330 (the same reference numbers refer to the same elements) with a box 1320, where the light fitting contains a ratchet mechanism part 1354 that is separate from the box and where the ratchet mechanism part is arranged in such a way that the ratchet mechanism part is accessible from a first side of the panel after installation. Panel 1322 is a bit thinner than panel 822 in Figs. 8-12. The cable tie 1338 in Figure 13 is a bit different to the cable tie depicted in Figs. 8-12 as the flange arrange-

ment 1344 points downward (in the orientation shown in the drawing), in such a way that the underside of the flange arrangement is not flat (in the orientation shown in the drawing), i.e., not at a right angle in relation to the part of the cable tie that goes down through the box. This makes it possible to grip the slightly thinner panel 1322 (in relation to panel 822 in figures 8-12).

**[0095]** In Fig. 13, light fitting 1330 is shown below panel 822 and the arrow pointing vertically upward indicates that the light fitting can be partially inserted through cavity 850.

**[0096]** Fig. 14 shows an electrical connector 1450 (not shown in Fig. 13, even if it is also present there) and that the light fitting 1330 is inserted partially through the cavity in the panel and secured in a similar way to Figs. 8-12, apart from the fact that ratchet mechanism 1354 in Figs. 13-14 is separate and Fig. 14 is made to sit flush against a part 1348 of the box during installation, which, in this embodiment, is also a track that guides the separate ratchet mechanism's movement inside the box (in the figure, the upward movement that occurs between Figs. 13 and 14). In other embodiments, there is no part 1348 and the lock 1354 is instead directly flush with an inner surface of the box 1320.

**[0097]** The scissors in Fig. 14 also indicate that the tensioned part of the cable tie can be broken from the first side of the panel in a similar way as in Fig. 11 and the light fitting thereby removed.

**[0098]** In all Figs. 8-14, for the sake of simplicity only a single cable tie is shown but it is also possible that there could be several cable ties, e.g., a cable tie on each side (total of 2 cable ties), or on all four sides (total of 4 cable ties).

**[0099]** Fig. 15 shows an alternative embodiment of a light fitting 1530 with a box 1520 corresponding to the box in Figs. 13-14, apart from the fact that the box is flush with an inner surface of the box 1520 (and thus does not have an element corresponding to 1348).

**[0100]** In Figs. 8-12, the cable tie is positioned outside the box's cavity, but it could also run entirely or partly inside the box's cavity (possible in a corresponding manner as in Figs. 13-15).

**[0101]** Fig. 16 shows a light fitting 1630 with a sealing element 1660 and also a primary flange arrangement 1642, a secondary flange arrangement 1644, a box 1620 and an electrical connector 1650.

**[0102]** Fig. 17 shows the light fitting 1630 as in Fig. 16 but with the sealing element 1660 shifted in direction towards the primary flange arrangement 1642.

**[0103]** Fig. 18 shows the light fitting 1630 as in Figs. 16-17 installed in a panel 1622 by means of the sealing element and, more specifically therefore, that the sealing element 1660 is, under the influence of the secondary flange arrangement 1644, shifted in direction towards the primary flange arrangement 1642 in such a way that the primary flange arrangement 1642 and sealing element 1660 grip onto the panel 1622.

**[0104]** Fig. 19 shows the light fitting 1630 as in Fig. 18

from a different angle.

**[0105]** Fig. 20 shows (A) in the left-hand side an embodiment of a light fitting installed in a panel 2022 and where the light fitting comprises two cable ties (one cable tie on the right-hand side and one cable tie on the left-hand side) where the cable tie on the left-hand side is shifted in such a way that the secondary flange arrangement 2044a on the cable tie is flush with the upper side of panel 2022 and locks the light fitting around the panel together with the primary flange arrangement 2042a that is flush with the underside of the panel.

**[0106]** Fig. 20 shows (B) in the right-hand side an embodiment of a light fitting installed in a panel 2022 and where the light fitting comprises two cable ties (one cable tie on the right hand side and one cable tie on the left-hand side) where the cable tie on the left-hand side is shifted in such a way that the secondary flange arrangement 2044b on the cable tie is flush with the upper side of the panel and locks the light fitting around the panel together with the primary flange arrangement 2042b that is flush with the underside of the panel (in the same way as in Sub-figure A on the left-hand side of Fig. 20). The figure also shows a sealing element 2060, (corresponding to sealing element 1660 in Figs. 16-19), which is arranged in such a way that it seals an opening between the light fitting and the panel. In one embodiment in sub-figure \ on the right-hand side of Fig. 20, installation takes place (exclusively) via elements that have a higher Young's modulus than the sealing ring (e.g., where "exclusively" needs to be understood as meaning that the light fitting will be secured to the panel in an equivalent or in the same manner even if the sealing element is removed or dismantled).

**[0107]** Fig. 21 shows an alternative embodiment of a light fitting 2130 (in relation to, for example the light fitting in Fig. 15, but where the same reference numbers refer to the same elements) with a box 2120, where the light fitting contains a ratchet mechanism part 2154 that is separate from the box and where the ratchet mechanism part is arranged in such a way that the ratchet mechanism part is accessible from a first side of the panel after installation. A distance between the primary flange arrangement and the secondary flange arrangement can be increased in a non-destructive manner where no parts (or the cable tie either) are damaged. This is achieved by the ratchet mechanism being available from the first side and where a connection between the box and a ratchet mechanism part can be broken in a non-destructive manner, where neither the box nor the ratchet mechanism part are damaged. In the embodiment shown, this is realized by means of a reversible click lock where the actual ratchet mechanism part contains spring-loaded elements (the right- and left-hand sides) where each contains a part (the triangular projection on the outer sides) that catch onto an element (the triangular cavities) on the box in such a way that the spring power keeps the spring-loaded element in a position where the ratchet mechanism part and the box are locked in relation to each other

and where the two parts can be separated if the spring power is overcome. The connection between the box and ratchet mechanism part can be released from the first side manually by means of ordinary fingers or a tool such as, for example, pliers that can press in on the sides of the ratchet mechanism part as indicated by the two opposing thick unbroken arrows.

**[0108]** Alternatively, the light fitting can be removed by means of the catch between the cable tie and ratchet mechanism being released from the first side through the detent going through the catch with the cable tie being accessible from the first side and being able to be bent and/or shifted away from the cable tie by means of a cylindrical element that is at least 1 mm in diameter (as shown in the drawing as element 2162, that can be inserted in an upward direction up to the detent in the ratchet mechanism part).

**[0109]** Fig. 22 shows a removal of light fitting 2130, where the box 2120 is taken down (as indicated by the open arrow) after the sides of the ratchet mechanism part 2154 have been pressed together as shown by the opposing arrow in Fig. 21 and/or the detent has been bent out of the catch with the cable tie from element 2162 in Fig. 21.

**[0110]** The figures show a possible embodiment and should not be interpreted as being limiting in relation to other possible embodiments that fall within the scope of protection as defined in the amended set of Claims. For example, they can indicate dimensions in different embodiments within the Claims being both greater or less than the dimensions indicated in the possible embodiment described above.

**[0111]** Although the present invention has been described in connection with the specified embodiments, this should not be interpreted as in any way limited to the examples presented. The scope of the present invention is indicated in the appended set of Claims. In connection with the Claims, it is the case that the expressions "comprising" or "comprise" do not exclude other possible elements or steps. It is also the case that the indication of references, such as "a" etc. should not be interpreted as an expression of a plurality. The use of numerals in the Claims with regard to elements indicated in the figures should not be understood as limiting the scope of the invention either. In addition, individual features referred to in different Claims may be combined and mentions of these features in different Claims do not exclude a combination of functions not being possible or advantageous.

## Claims

1. Light fitting (830) for installation in a panel (822), where the light fitting comprises:

- a box (820) comprising of a cavity (832) arranged to encircle a light source where the light fitting is arranged in such a way that the light

source can be accessed from a first side (834) of the panel after installation.

- a ratchet comprising:

- i. a cable tie (838) and
- ii. a ratchet mechanism 840 arranged so as to prevent a relative movement between

1. the cable tie, and
2. a part of the light fitting, such as the remaining part of the light fitting, that does not comprise the cable tie in at least one direction,

- a primary flange arrangement (842) to sit flush with a second side of the panel,
- a secondary flange arrangement (844) to sit flush with a second side of the panel,

where

- a distance (846) between the primary flange arrangement and the secondary flange arrangement can be reduced by means of the ratchet.

and/or

- where the light fitting can be installed in the panel through the ratchet mechanism locking the relative distance between the primary flange arrangement and the secondary flange arrangement,

and where the light fitting is arranged in such a way that a tensioned part of the cable tie is accessible from a first side of the panel after installation.

2. A light fitting (830) according to Claim 1, where the light fitting also comprises a sealing element.

3. A light fitting (830) according to Claim 2, where the sealing element is arranged in such a way that part of the sealing element or the entire sealing element can be shifted in relation to the box, possibly under the influence of the ratchet, so that during installation in the panel, the sealing element can be pressed against the panel and thereby put into a position where it seals an opening between the panel and the light fitting.

4. A light fitting (830) according to Claims 2 or 3, where the light fitting is arranged in such a way that, during installation in the panel, fixing can take place exclusively by means of elements, such as the ratchet and the primary flange arrangement and the secondary flange arrangement and possibly at least part of the box, that is made from materials that have a higher, such as at least 1% higher, such as at least 10%

higher, such as at least 50% higher, such as at least 100 % higher, Young's modulus than the Young's modulus for the material from which the sealing element is made.

5. A light fitting (830) according to any of the previous Claims, where a distance (846) between the primary flange arrangement and the secondary flange arrangement can be increased in a non-destructive manner.

6. A light fitting (830) according to any of the previous Claims, where the light fitting contains a junction unit that comprises:

- One or more electronic components,
- One or more electrical terminals and/or
- One or more electrical connectors,

arranged in such a way that the junction unit is accessible from a second side, such as in only from a second side of the panel after installation.

7. A light fitting (830) according to any of the previous Claims, where the box contains an opening (852), such as a through-going opening, that is arranged in such a way that, after installation, the opening is or could be positioned outside the tensioned part of the cable tie.

8. A light fitting (830) according to any of the previous Claims, where the light fitting contains a ratchet mechanism part (1354) that is separate from the box and where the ratchet mechanism part is arranged in such a way that the ratchet mechanism part is accessible from a first side of the panel after installation.

9. A light fitting (830) according to Claim 8, where the box is arranged in such a way that the ratchet mechanism part is flush with a surface inside the cavity on installation, such as so that the ratchet mechanism part itself is entirely or partly inside the cavity on installation.

10. A light fitting (830) according to any of the previous Claims, where the light fitting is a downlight light fitting.

11. A light fitting (830) according to Claim 10, comprising a downlight front (100, 700) that comprises a flange (102, 702), where a light source (718) can be flush with the flange, where there are one or more cutouts (104, 704) in the part of the flange the light source can be flush with and where the one or more cutouts are arranged so that a light source (718) can be flush against the flange in such a way that there are one or more through-going openings between the flange

and the light source.

12. A lamp comprising a light fitting according to any of the previous Claims and optionally a lamp front.

13. A structural element, such as a construction element, such as a cladding component, comprising:

- the panel, and
- a Light Fitting (830) according to any of Claims 1-11 or the lamp according to Claim 12.

14. Use of the light fitting (830) according to any of Claims 1-11, the lamp according to Claim 12, or a structural element according to Claim 13 to secure or partly secure a light source (718).

15. A procedure for removal of a light fitting according to any of the Claims 1-11, where the light fitting is installed in the panel and where the procedure comprises a tensioned part of the cable tie being accessed and broken from a first side of the panel and/or at a distance (846) between the primary flange arrangement and the secondary flange arrangement being increased in a non-destructive manner.

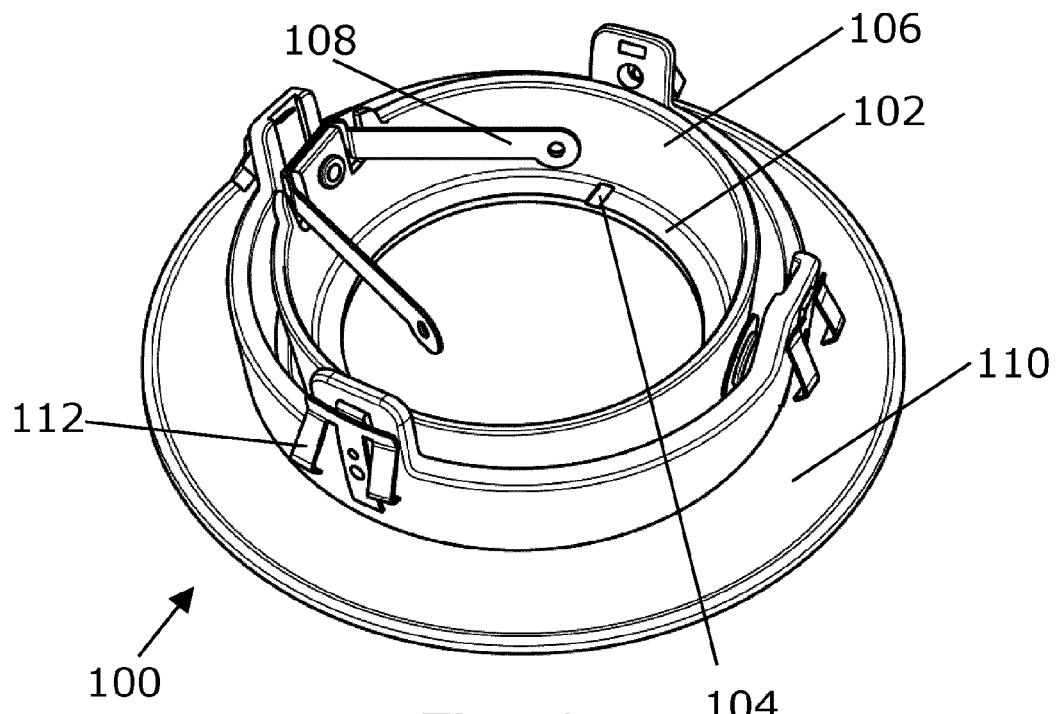


Fig. 1

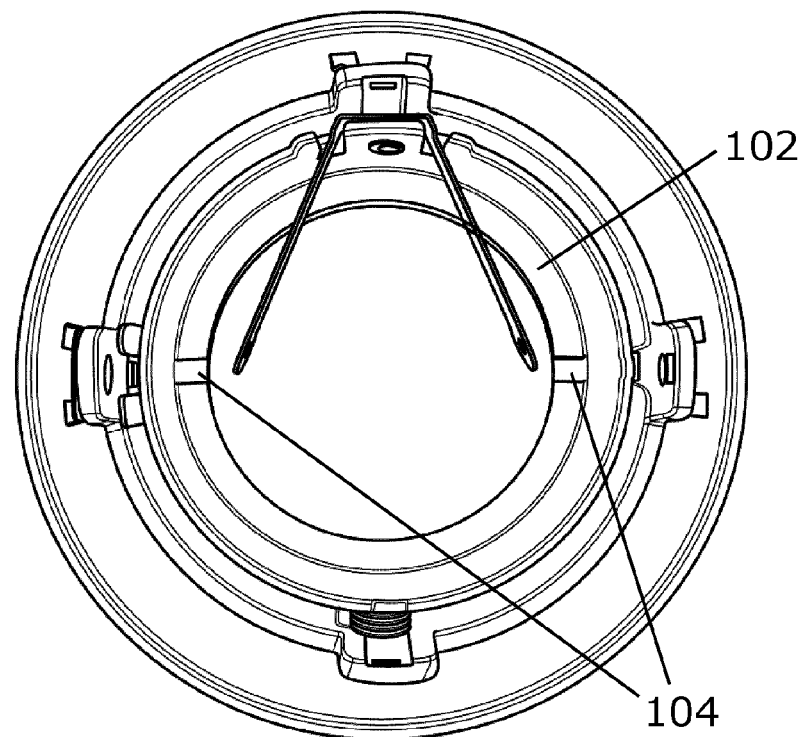


Fig. 2

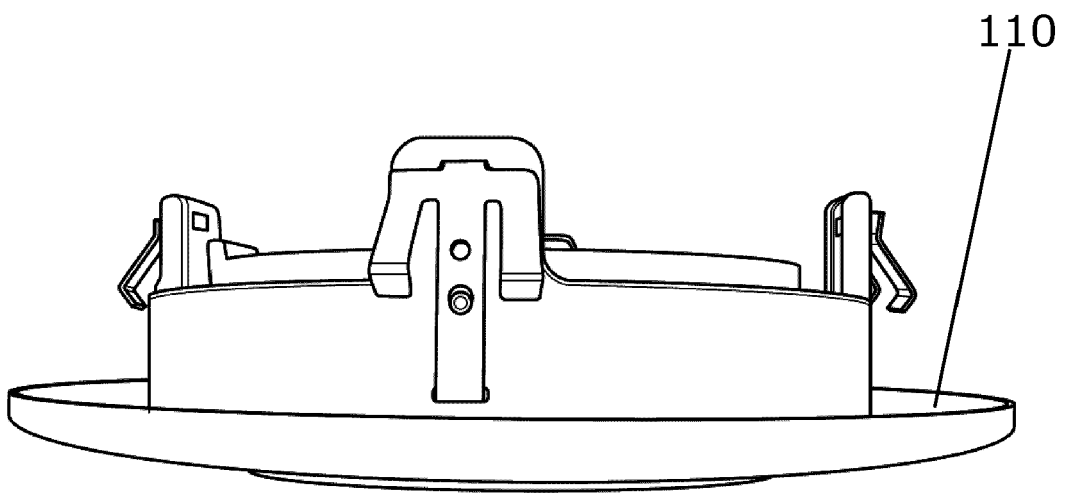


Fig. 3

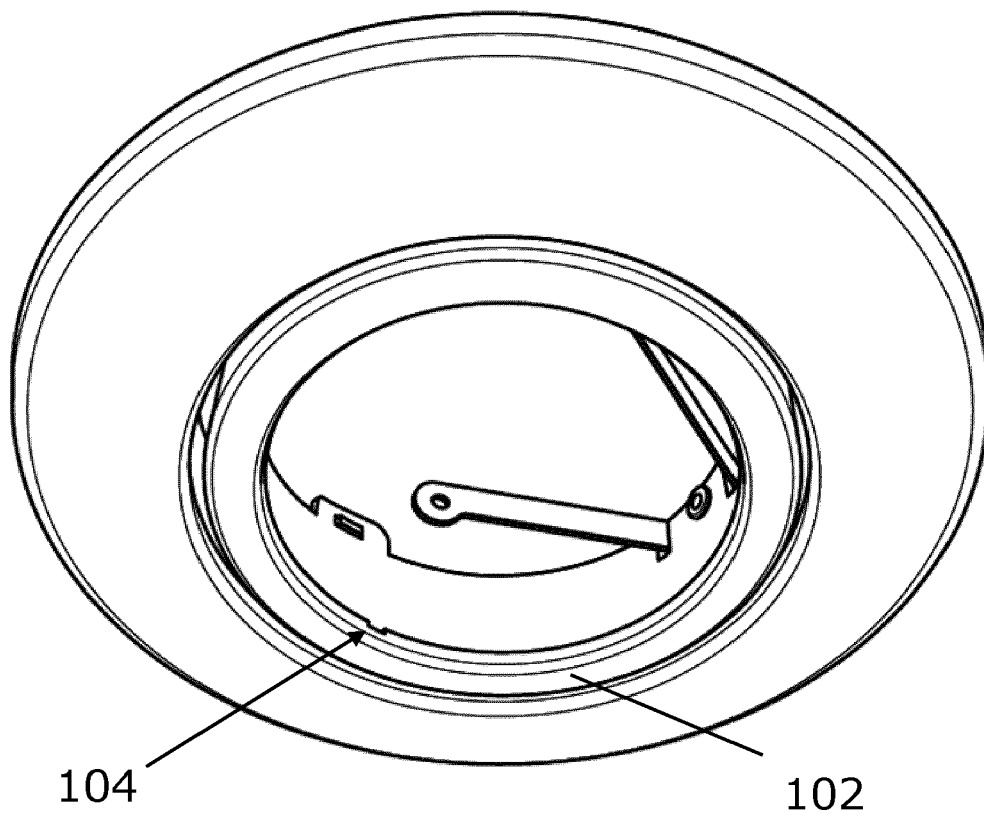


Fig. 4

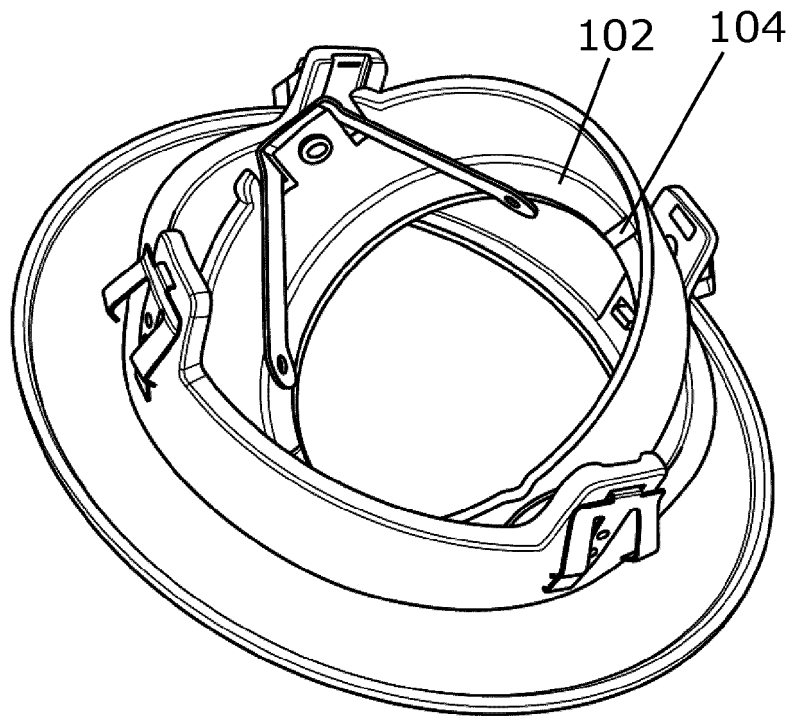


Fig. 5

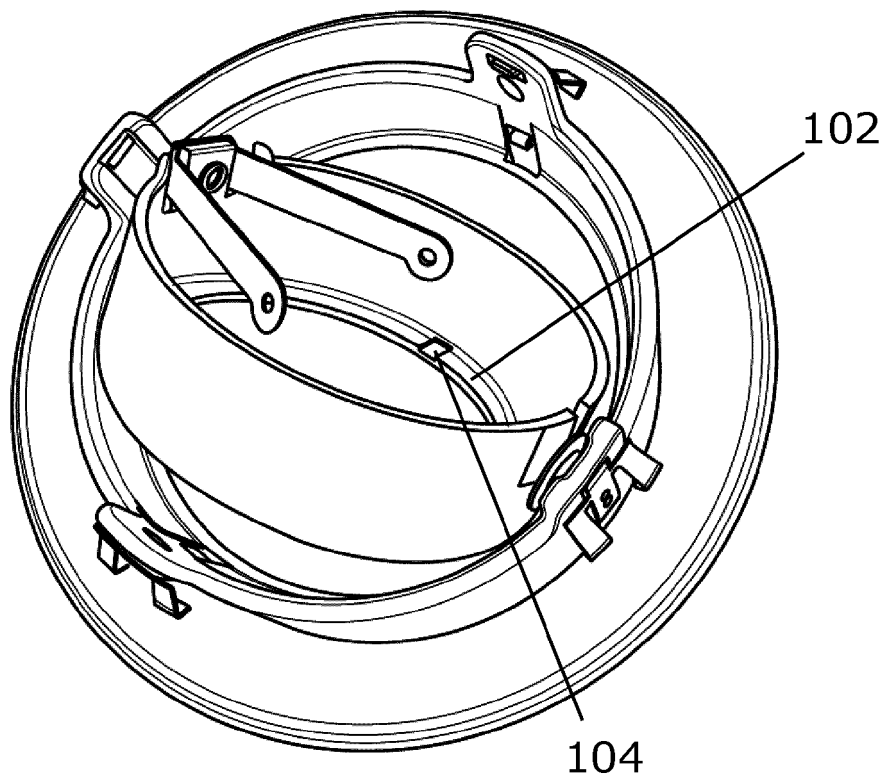
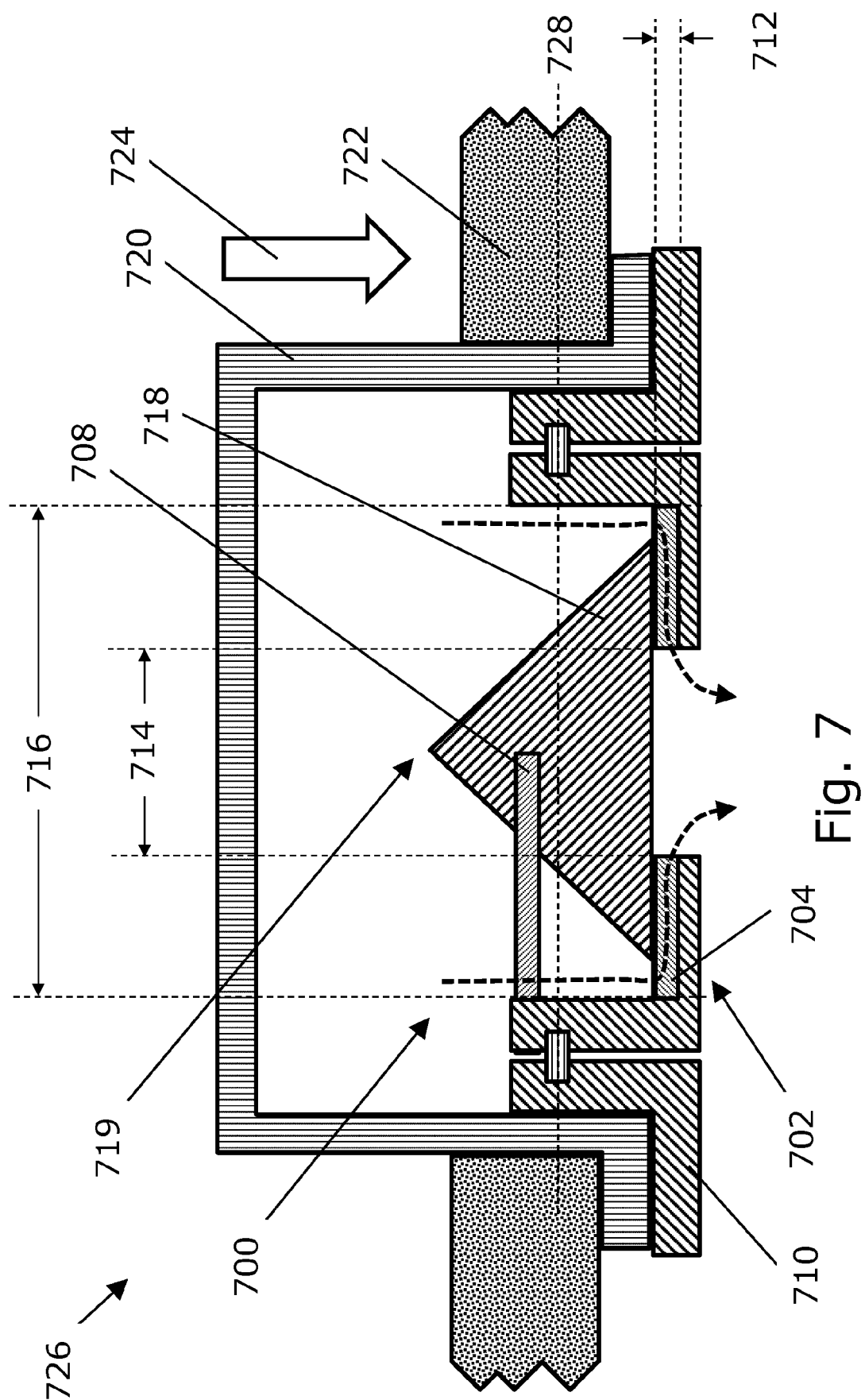


Fig. 6



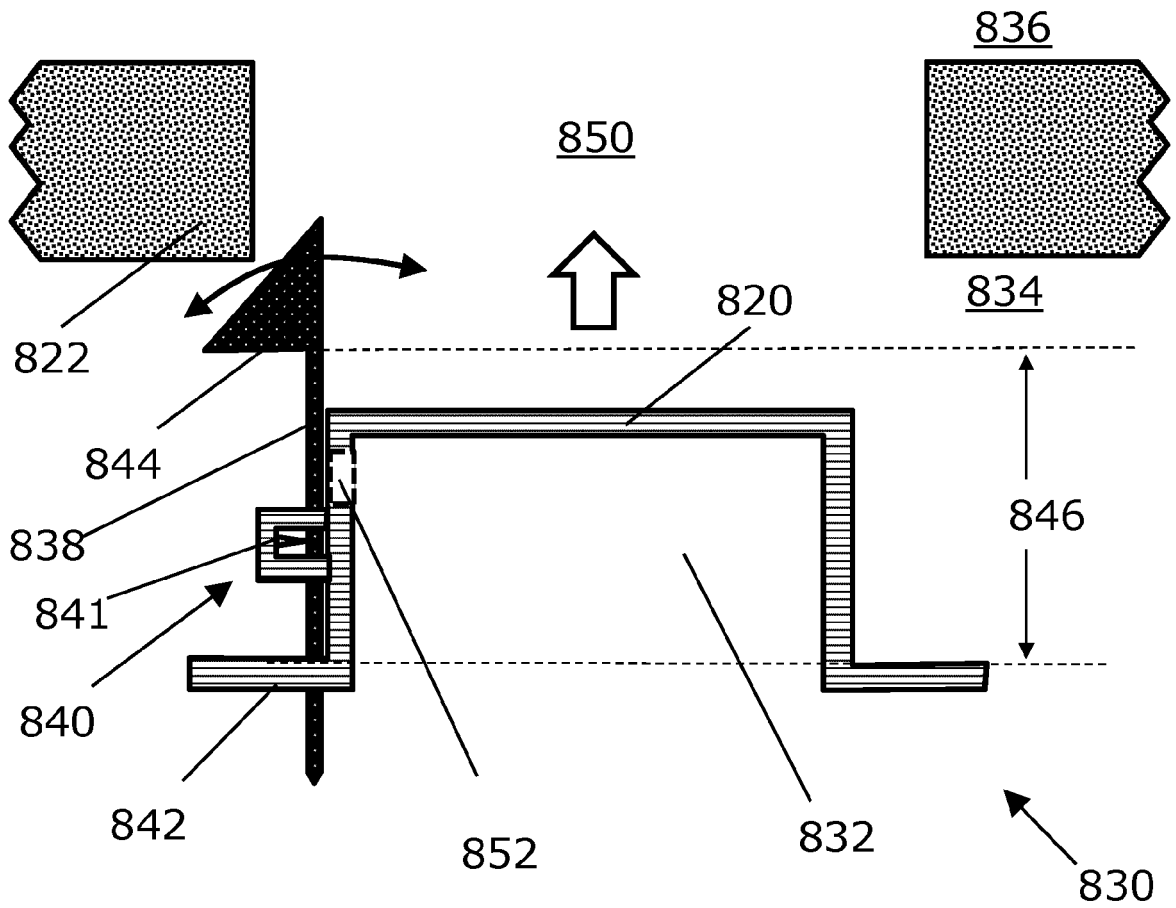


Fig. 8

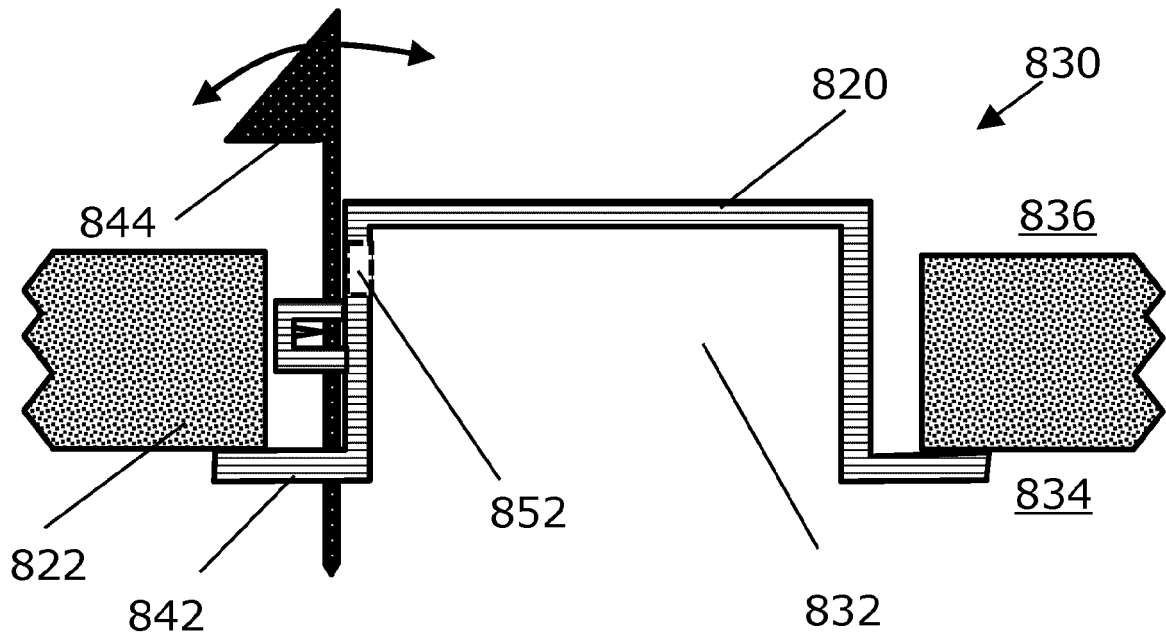
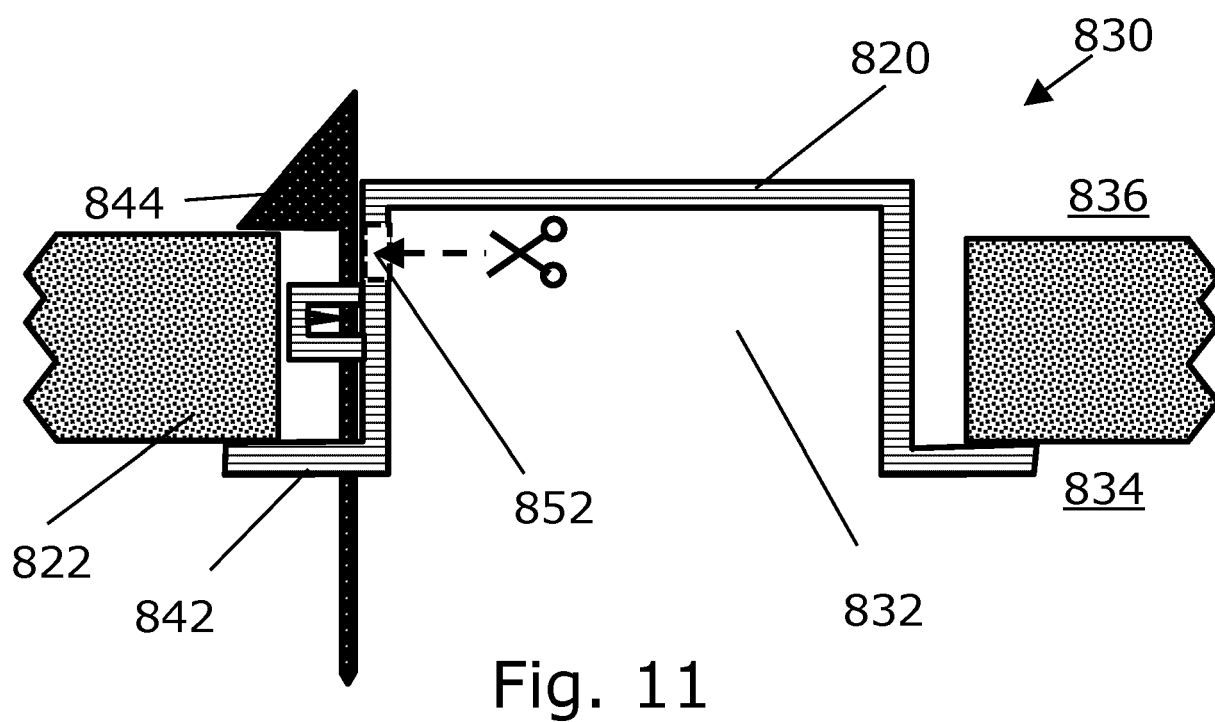
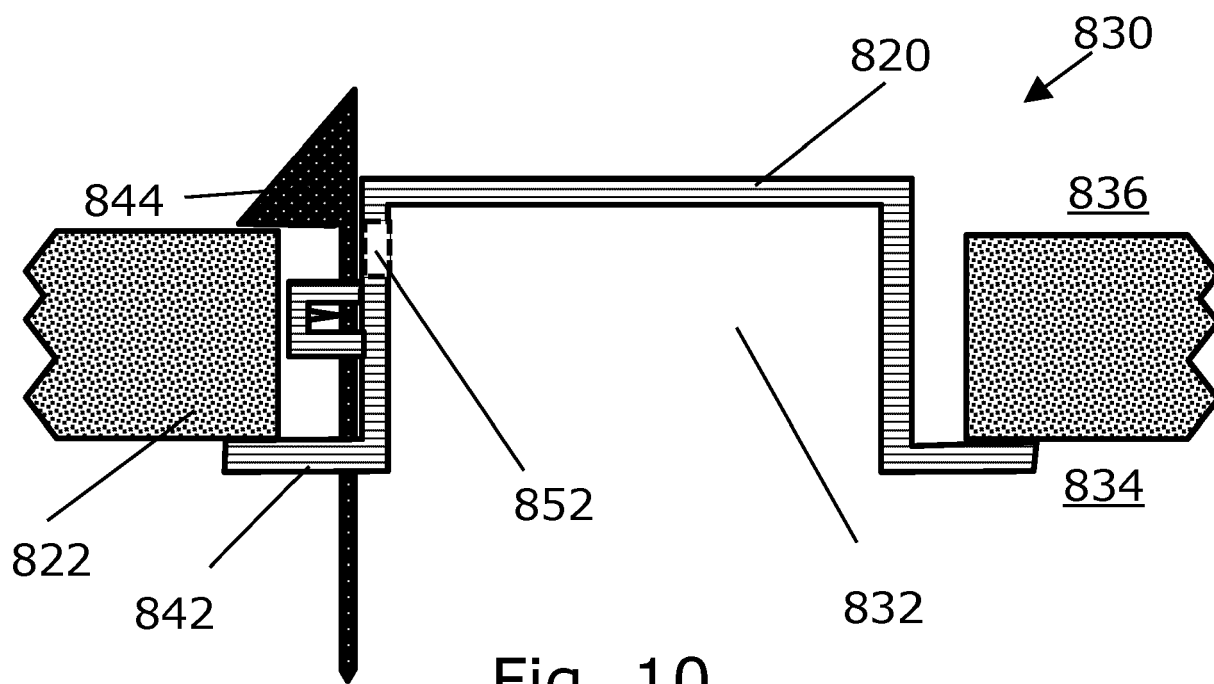
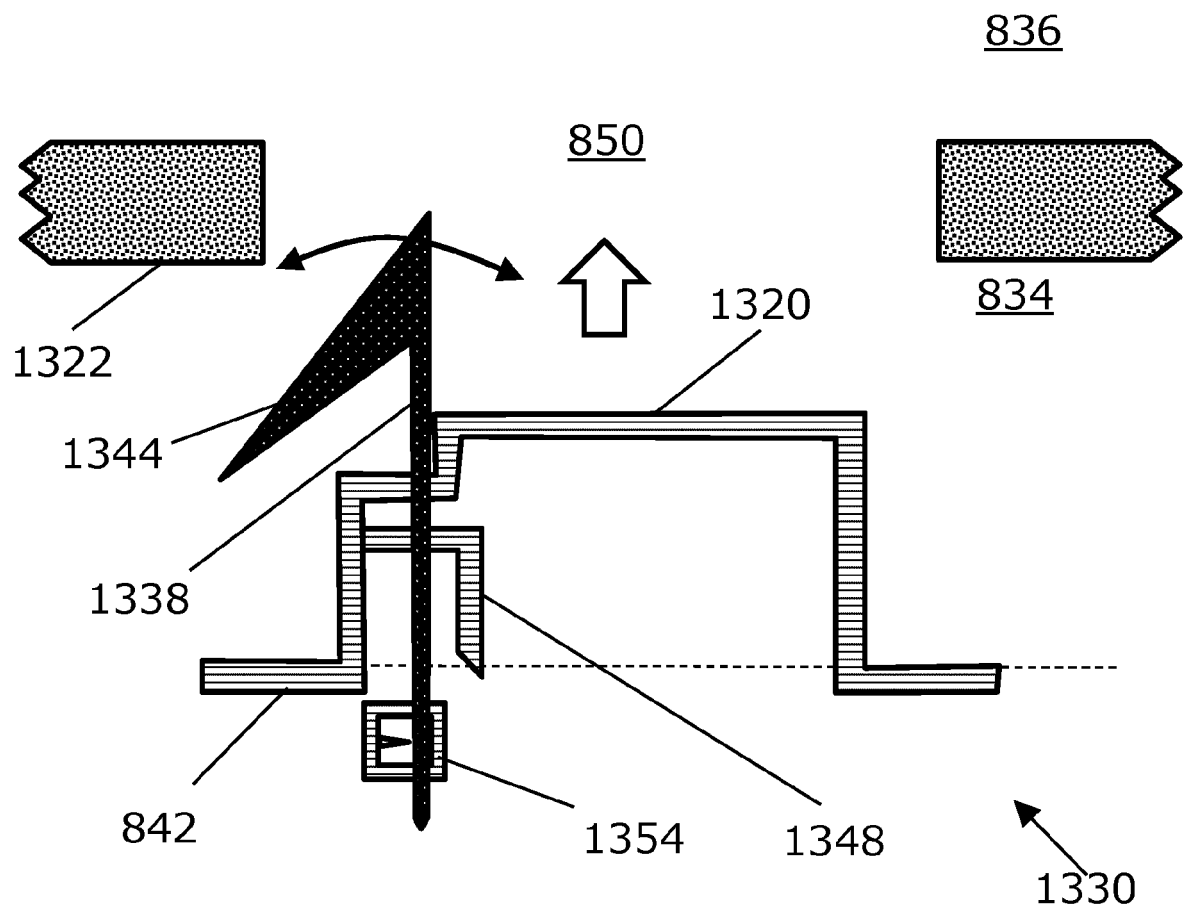
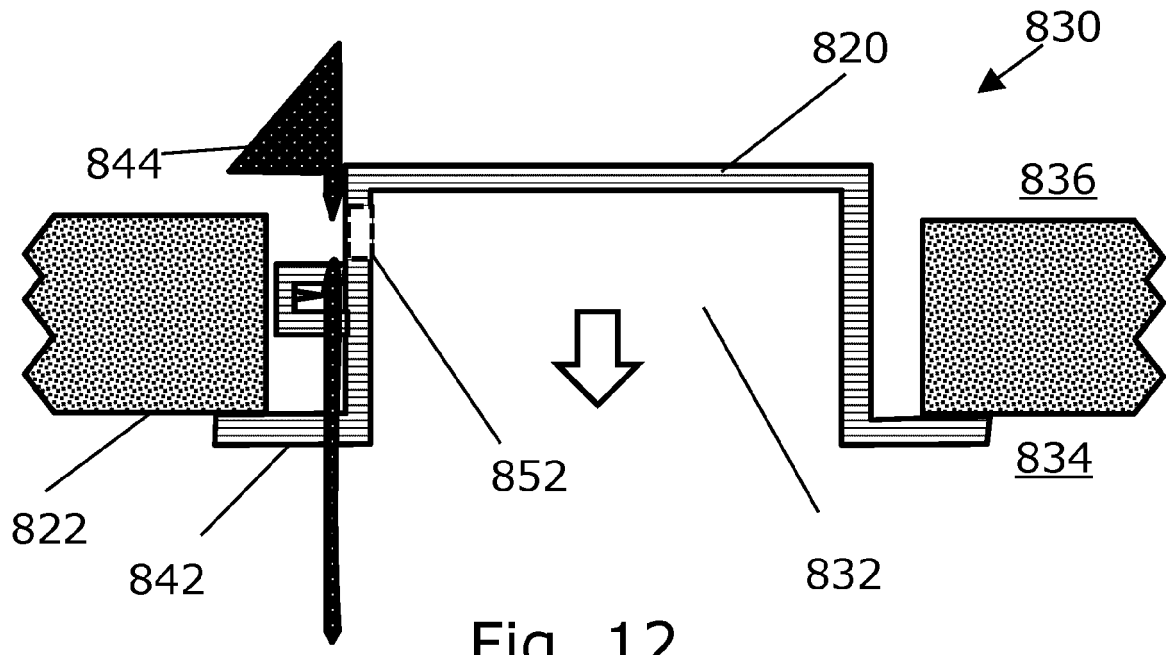
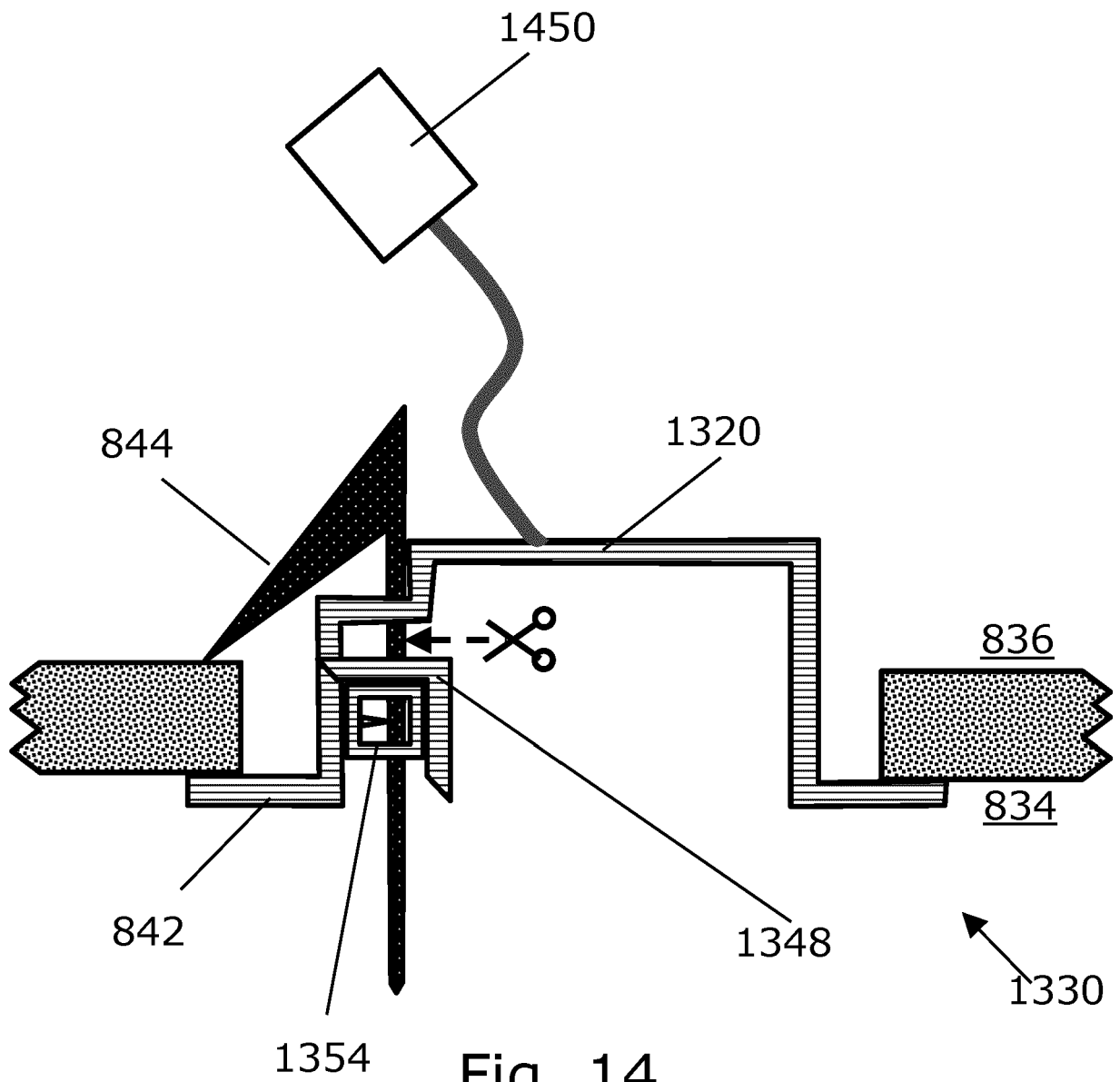


Fig. 9







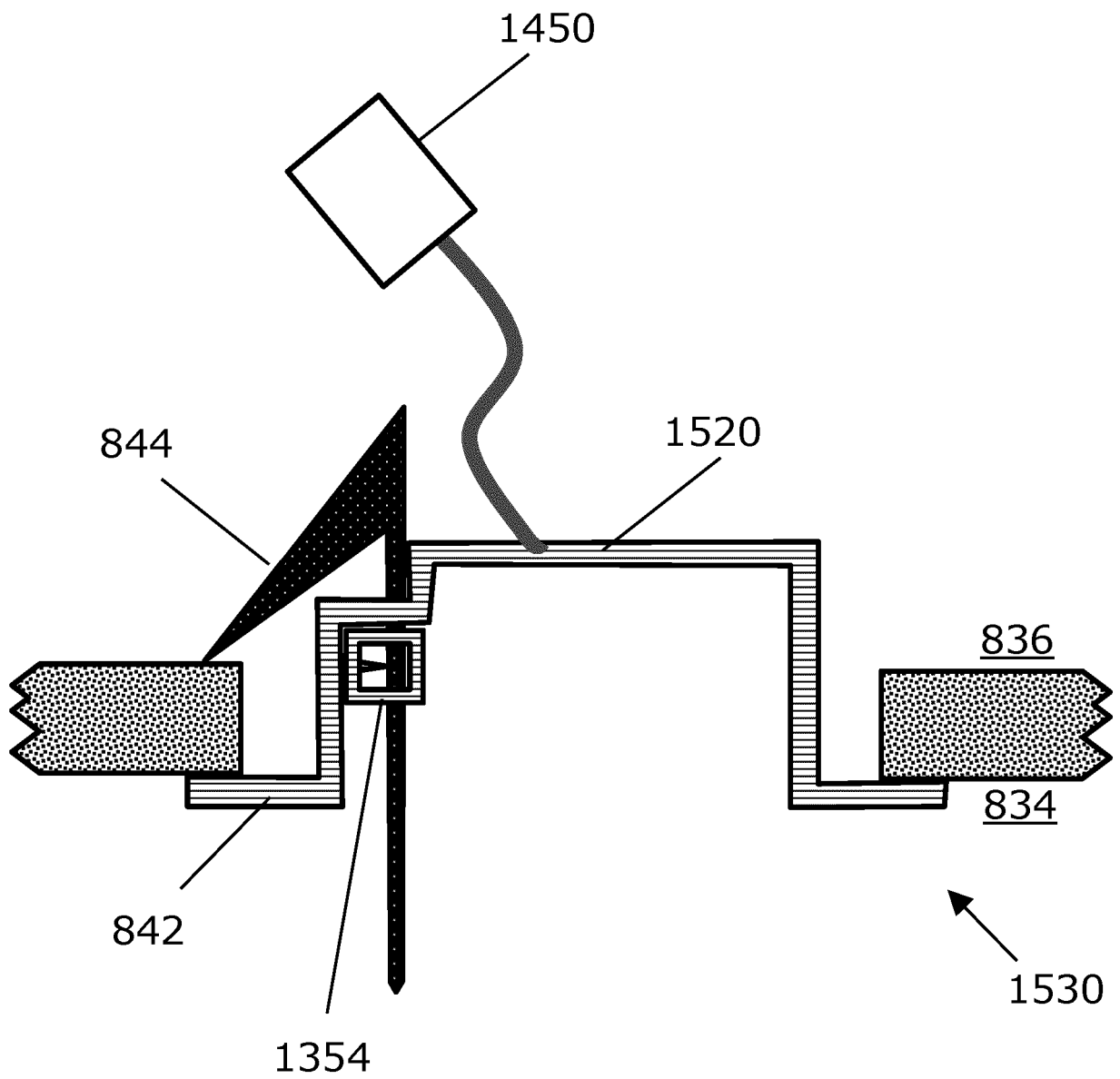


Fig. 15

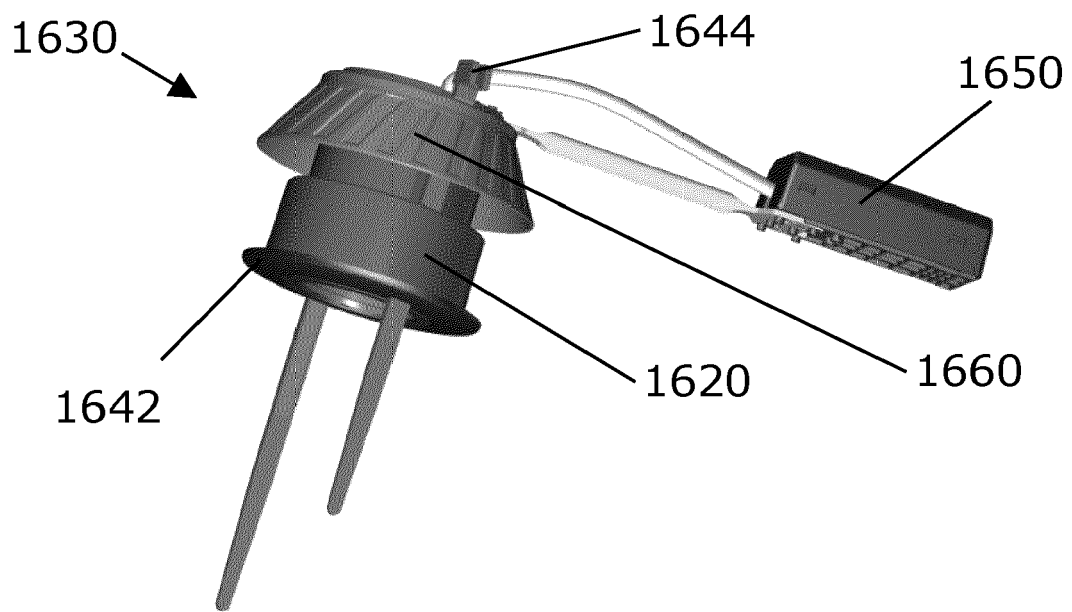


Fig. 16

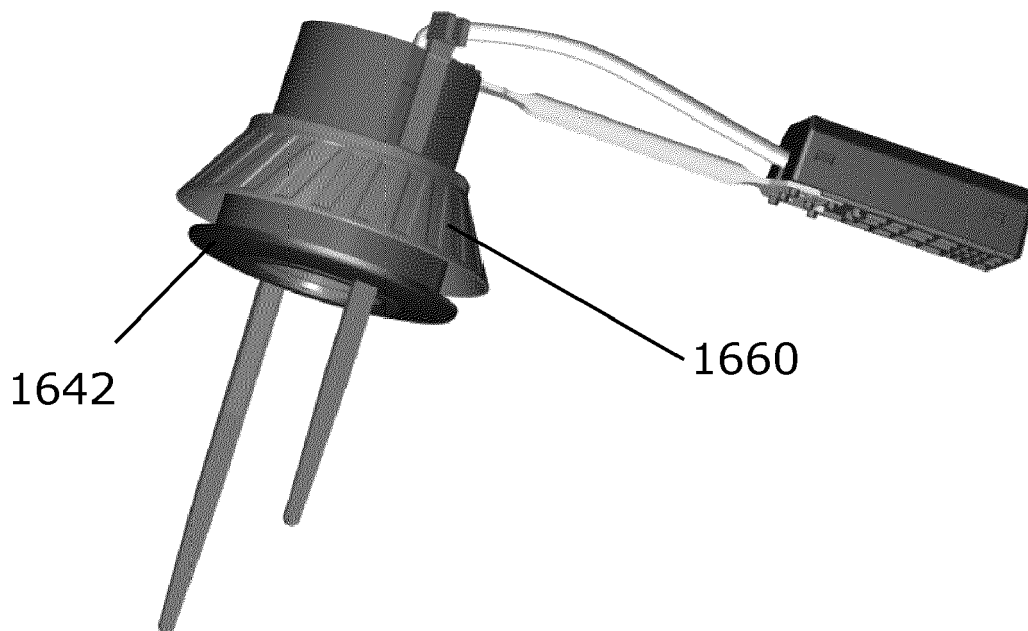


Fig. 17

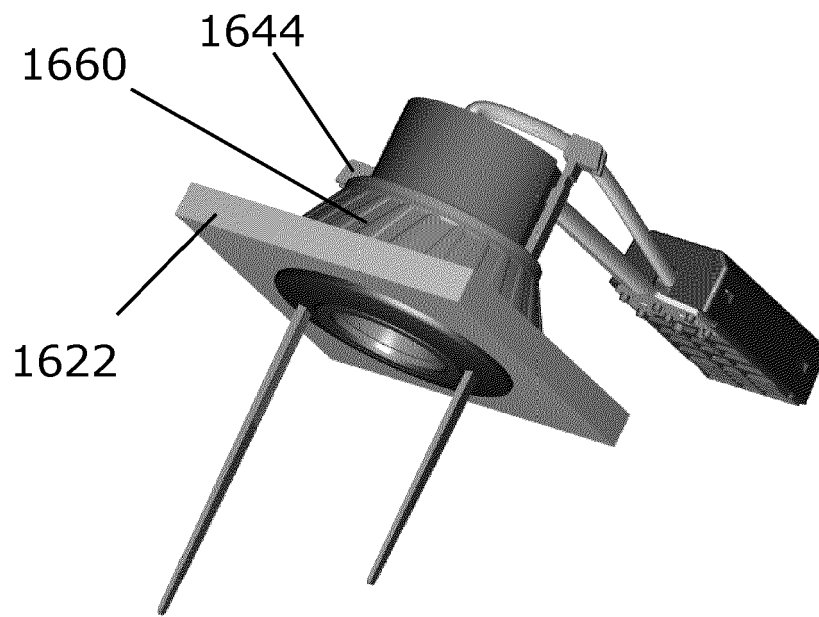


Fig. 18

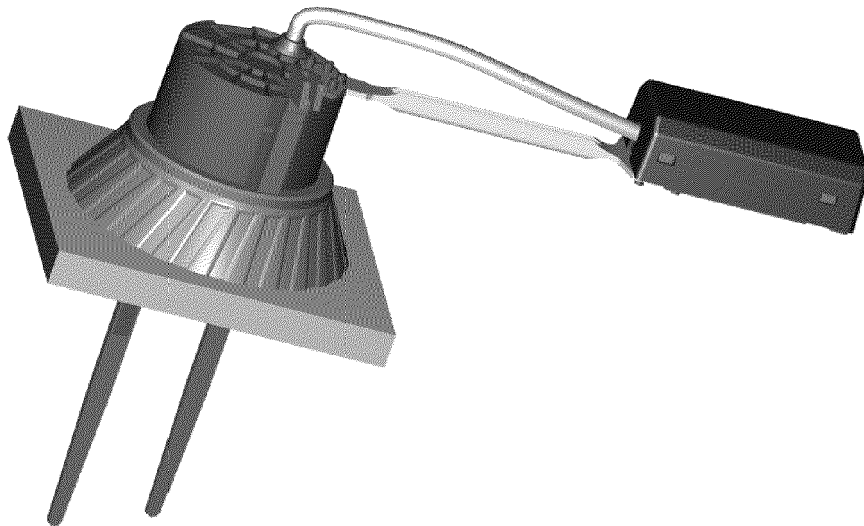


Fig. 19

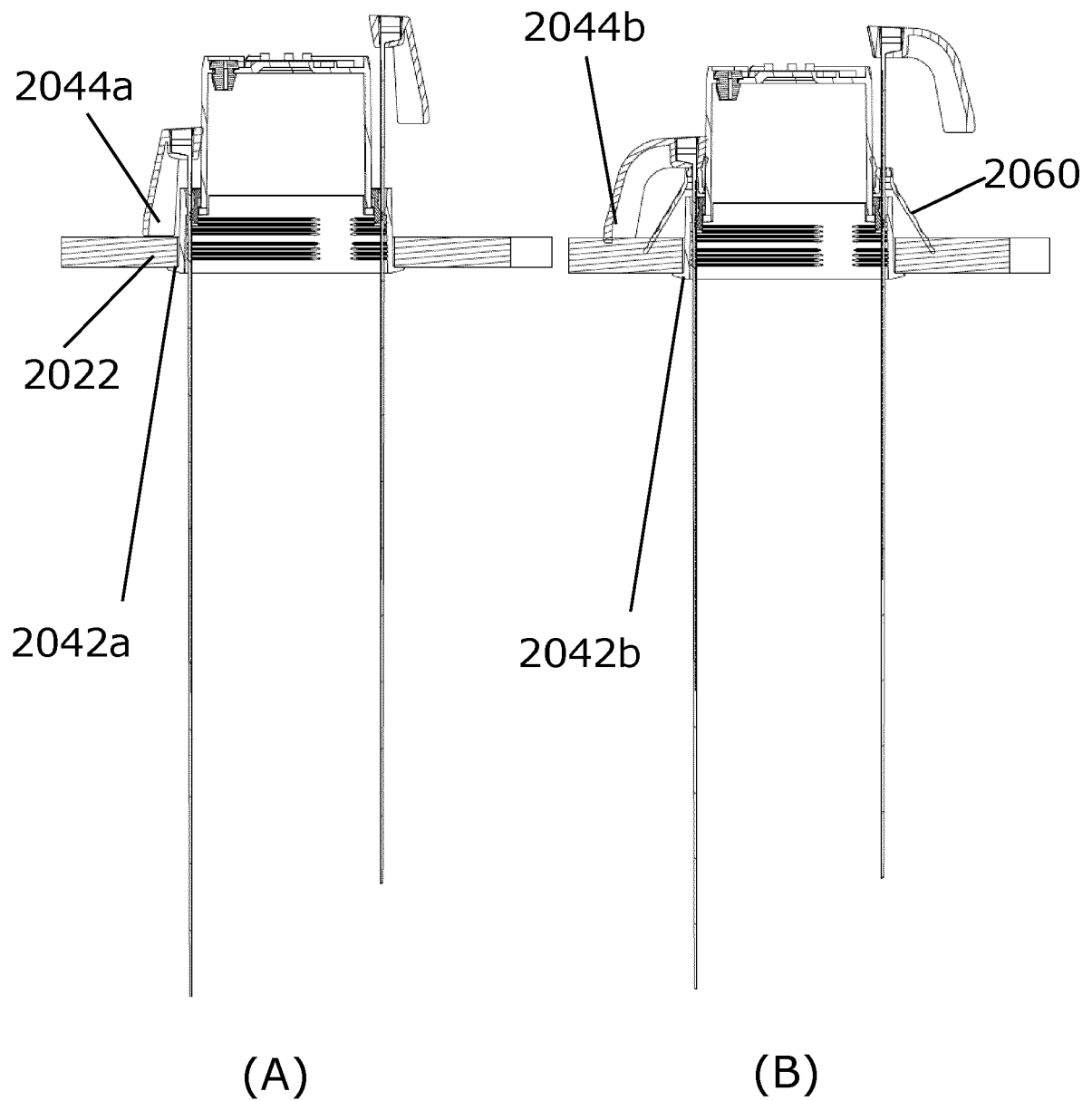


Fig. 20

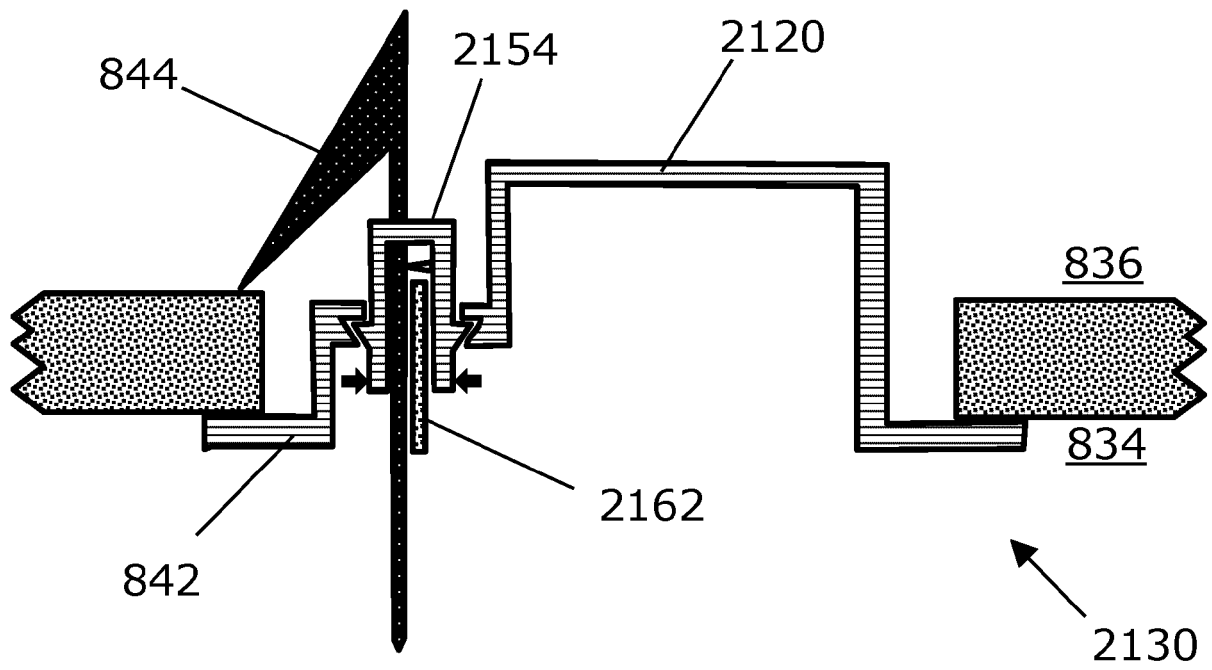


Fig. 21

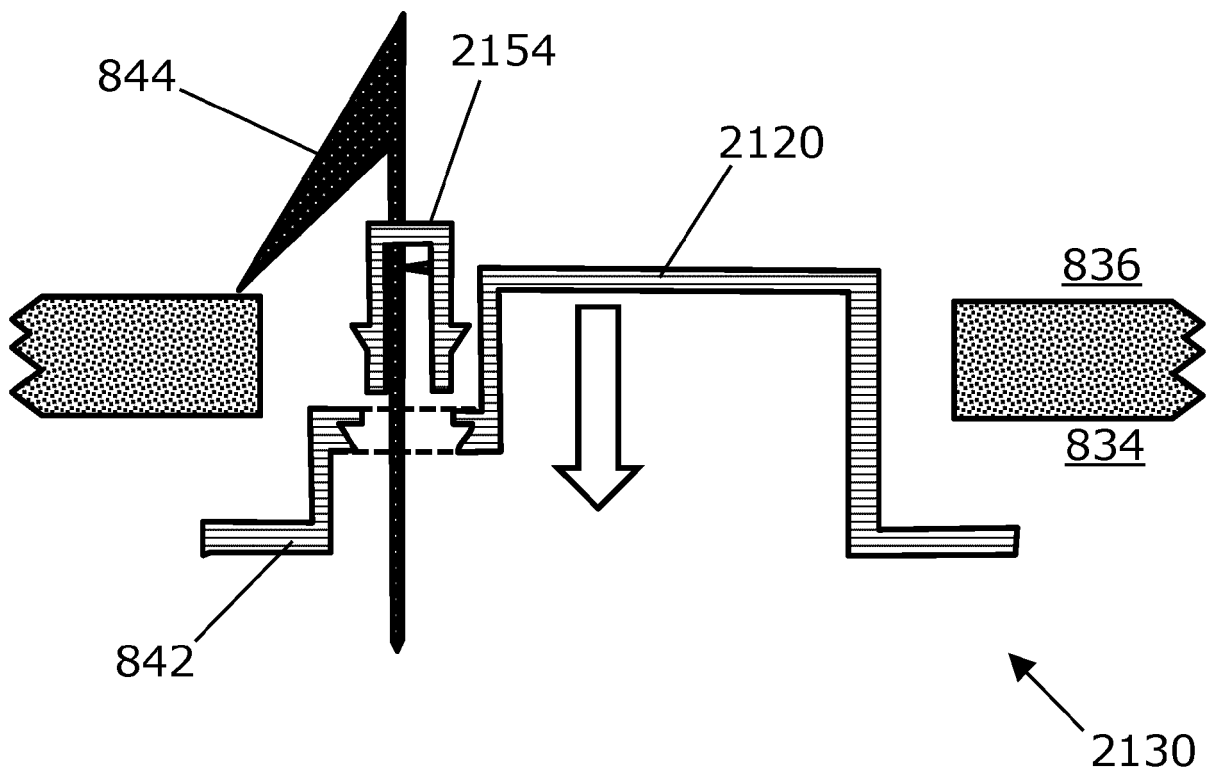


Fig. 22



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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                       |                                         |
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| Place of search<br><b>The Hague</b>                                                                                                                                                                                                                    |                                                                                                                                                                                                                                        | Date of completion of the search<br><b>12 April 2022</b>                                                                                                                                                                                                                              | Examiner<br><b>Dinkla, Remko</b>        |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                                                                                                        | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                         |

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