

(19)



(11)

EP 3 851 741 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.07.2021 Bulletin 2021/29

(51) Int Cl.:
F21V 17/00 ^(2006.01) **F21V 21/35** ^(2006.01)
F21V 23/00 ^(2015.01)

(21) Application number: **20152395.8**

(22) Date of filing: **17.01.2020**

(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
KH MA MD TN

(72) Inventors:
 • **Wild, Emanuel**
6850 Dornbirn (AT)
 • **Maldoner, Jakob**
6850 Dornbirn (AT)

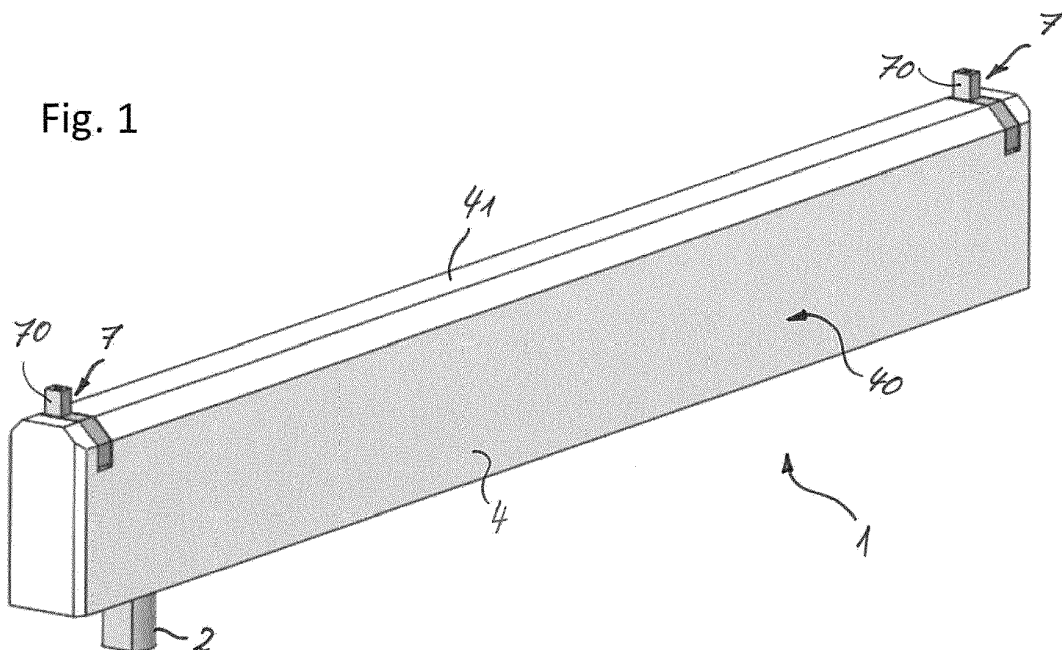
(74) Representative: **Kiwit, Benedikt**
Mitscherlich PartmbB
Patent- und Rechtsanwälte
Sonnenstraße 33
80331 München (DE)

(71) Applicant: **Tridonic GmbH & Co. KG**
6851 Dornbirn (AT)

(54) ELECTRONIC DEVICE FOR OPERATING A LIGHT SOURCE

(57) The present invention relates to an electronic device (1) for operating a light source (2), like an LED light source, comprising an electronic component (3), a flat housing (4) having two opposite side walls (40) connected by a circumferential edge (41) to delimit an inner space (42) for enclosing and carrying the electronic component (3), an electric contact (5) being electrically connected to the electronic component (3) to allow for external electrical connection of the electronic component (3), and a spacer (7) being detachably attachable to the hous-

ing (4) so as to protrude with a stopper section (70) from the edge (41) in an extension direction (E). The present invention is further directed to a luminaire system (100) having the electronic device (1) according to the present invention. Also, the present invention is directed to a kit comprising an electronic device (1) according to the present invention and having a plurality of the spacers (7). Moreover, the present invention is directed to a method for inserting the electronic device (1) in a luminaire track (10).

Fig. 1**EP 3 851 741 A1**

Description

[0001] The present invention relates to an electronic device for operating a light source, like an LED light source, comprising an electronic component housed in a housing. The present invention is further directed to a luminaire system comprising a luminaire track with a longitudinal track profile, in which the electronic device is positioned. The present invention is further directed to a kit comprising an electronic device to provide different profile layouts of the longitudinal track profile. Moreover, the present invention is further directed to a method for inserting the electronic device in the luminaire track.

[0002] Electronic devices to be fit into longitudinal but flat spaces of a longitudinal track profile of a luminaire track are known in the prior art. These electronic devices are usually housed within a housing for enclosing an electronic component. To allow for a defined positioning of the electronic device within the internal space of the longitudinal track profile, the housing usually has a flat section to be inserted in the longitudinal track profile. The housing further has, at its bottom end, a widened section. The housing thus may have, for instance, a T-shape in cross-section. The widened section is designed such that it comes into abutment with an outer edge of the track profile, e.g. delimiting an insertion opening for inserting the flat section of the housing, when the electronic device is inserted with its flat section - e.g. via the insertion opening - into the longitudinal track profile to thus allow for a defined positioning of the electronic component in an insertion direction. This defined position allows for an electric contact of the electronic device being correctly positioned relative to an electric connection element, like a cable, extending within the longitudinal track profile so that a secure electric connection between these elements can be obtained. However, the widened section is comparably large and thus visible from the outside, as it is not intended to enter the insertion opening but getting into abutment with the longitudinal track profile to securely allow for the defined positioning. Also, grounding of the electronic component must be individually provided, e.g. a cumbersome attachment of a grounding connection by separate cable is necessary, dependent on the relative cross-sectional layout and dimensions of the longitudinal track profile with respect to the electronic device or its housing.

[0003] It is thus an object of the present invention to provide an electronic device, a luminaire system equipped with the same as well as a method for inserting such an electronic device in a luminaire track, which allow for an increased aesthetic appearance, while at the same time allowing for a secure electrical connection even for different layouts of a luminaire track profile.

[0004] This object is achieved by the subject-matter of the independent claims. The dependent claims study further the central idea of the present invention.

[0005] According to a first aspect, the present invention is directed to an electronic device for operating a light

source, like an LED light source. The electronic device comprises an electronic component. Moreover, the electronic device comprises a flat housing having two opposite side walls connected by a circumferential edge to delimit an inner space for enclosing and carrying the electronic component. In the sense of the present invention, "flat" preferably means that the dimensions of the housing along two axes are many times higher than the dimension of the housing along an axis being orthogonal to the other two axes. The electronic device further comprises an electric contact being electrically connectable or connected to the electronic component to allow for external electrical connection of the electronic component. The electronic device further comprises a spacer being detachably attachable or attached to the housing, so as to protrude with a stopper section from the edge in an extension direction preferably being in parallel to an (edgewise) insertion direction of the electronic device, which in turn is preferably in parallel to a plane of extension of the flat housing.

[0006] The electronic device according to the present invention, particularly due to its detachably attachable spacer, allows for a defined positioning of the electronic device with respect to a corresponding layout of a luminaire track, in which the electronic device is to be inserted. By means of the selectively attachable spacer, different abutment positions can be defined which allow for the electronic device always being inserted inside a luminaire track only to a defined/desired amount to thus allow for the electric contacts being correctly positioned, i.e. with respect to electric connection elements of a luminaire track. As the electronic device can also be adapted to a corresponding luminaire track profile, the electronic device can preferably be easily hidden within the luminaire track profile, so that a widened section for an external abutment can be avoided, thus allowing for an increased aesthetical appearance of a luminaire track profile equipped with the electronic device.

[0007] The electronic device further comprises a grounding pin being functionally (i.e. preferably electrically) connected to the electronic component and being movably provided along a moving direction between an exposed position projecting from the edge and a retracted position, in which the grounding pin projects less (i.e. compared to the exposed position) from or is substantially flush with the edge. The extension direction can preferably be in parallel to the moving direction.

[0008] The electronic device thus allows for a secure grounding connection due to the movably provided grounding pin. Further, the combination of the detachable spacer and the movably provided grounding pin allows for a secure grounding of the electronic device even in different layouts, i.e. resulting in different amounts of insertion..

[0009] The grounding pin is preferably biased to or towards the exposed position. Hence, the grounding pin is always forced towards the contact and thus grounding position. Alternatively, the grounding pin can also be de-

signed to be fixed, e.g. with a separate fixing means, in any defined position along its moving direction. Also, there may be provided some structural means, which allow for the grounding pin to be securely positioned in a particular number of dedicated positions along the moving direction.

[0010] The spacer, preferably the stopper section, may comprise a through hole along the moving direction in which the grounding pin is movably received and more preferred movably guided. The grounding pin and the spacer can thus be provided in a space-saving manner. Moreover, the spacer can, at the same time, form a securing or even a guiding element to allow for defined movement of the grounding pin. This also allows for a mechanical protection of the grounding pin during handling of the electronic device, if required.

[0011] The stopper section may protrude from the edge in the extension direction at most up to the exposed position. As the stopper section thus maximally protrudes the same amount as the grounding pin, grounding can always be secured; particularly in a case, in which the abutment section of the luminaire track profile to get into abutment with the spacer on the one hand, and the grounding section to get into abutment with the grounding pin on the other hand, are provided within the same plane.

[0012] The stopper section preferably has a pin-like, plate-like, spike or any type of shape. The stopper section may also have an angled (e.g. square, rectangular, etc.) or round (e.g. circular, oval, etc.) cross section when viewed in the extension direction. This allows for an easy design of the stopper section.

[0013] The spacer may comprise a first engagement structure being in detachable engagement with the corresponding second engagement structure of the housing for detachably attaching the spacer to the housing. Such a structure can be easily provided and allows for an easy detachable attachment of the spacer to the housing. The engagement structure may, for instance, comprise a snap-on connection or the like.

[0014] The spacer may comprise a holding section to span or extend between the opposite side walls across the edge. The spacer can thus be designed to snap over or onto the housing to thus easily attach the spacer in a detachable manner.

[0015] The holding section may comprise engagement sections extending along part of the side walls. This allows for a secure mechanical connection of the spacer and the housing.

[0016] The holding section may have, for instance, a U-shaped layout, which allows for an easier attachment of the spacer onto the housing by simply putting the spacer with the open side of the U-shape onto the edge. Also, a U-shaped layout may improve an intuitive attachment of the spacer onto the housing.

[0017] The holding section, preferably the engagement sections, may comprise the first engagement structure. This first engagement structure may simply be the contour of the holding section or further comprises addi-

tional protruding or set back structures. The second engagement structure of the housing can then comprise corresponding set back or protruding structures, e.g. a groove for at least partially receiving the holding section.

[0018] The electric contact may extend from the housing, preferably from one of the side walls thereof, to allow for external electrical connection of the electronic component.

[0019] The electric contact thus provides a protruding section, which can be easily brought into engagement within an external electric connection element of a luminaire track. Of course, the electric contact can also be any other kind of electric contact, like a plug or a socket or an electric terminal and the like.

[0020] The electric contact can be designed to be selectively retractable to allow for an edgewise insertion of the electronic device in a longitudinal luminaire track. As the electric contact can be selectively retracted, the overall dimension of the electronic device can be reduced, e.g., by the amount of the protrusion of the electric contact, so that, due to its minimal dimension, the electronic device is externally preferably only limited by its flat housing, which can thus be easily inserted into a longitudinal profile of the luminaire track. Due to the electric contact being selectively retractable, an electric contact/connection with an electric connection element can also be easily obtained by simply moving out the electric contact again.

[0021] The electronic device may comprise a light source being electrically connected with the electronic component and/or a connection section for (e.g. selectively) electrically connecting a (e.g. external) light source with the electronic component for operating the light source. The light source preferably is an LED light source. This allows for an easy connection of a light source to the electronic device. Of course, the connection section may also be used for electrically connecting any other type of luminaire component, like a sensor, etc.

[0022] The side walls of the housing both extend substantially in parallel with respect to the same plane. This results in a symmetrically and specifically flat layout of the housing, which in turn allows for an electronic device to be inserted in a flat slot-like opening of a longitudinal track profile of a luminaire track.

[0023] The housing and/or the spacer are preferably made of an electrically insulating material, like plastic. Alternatively, the spacer can also be made of an electrically conducting material, like metal sheet. The spacer can thus be used for grounding. Therefore, the spacer made of an electrically conducting material is preferably (electrically) connected to the electronic component. This can be obtained by direct connection or, alternatively and according to a preferred embodiment, by the grounding pin. The grounding pin can thus be provided in a manner as described herein above and is in functional (i.e. electrical) connection with the spacer, which in turn is designed to be in abutment (i.e. physical contact) with the track profile into which the electronic device is to be inserted. For instance, the spacer extends over the ground-

ing pin, i.e. across its moving direction, so that the preferably biased grounding pin lies in secure abutment at the electrically conducting spacer, to thus provide a secure functional connection between the mentioned components to allow for a secure grounding function.

[0024] According to a further aspect, the present invention is directed to a luminaire system, comprising a luminaire track having a longitudinal track profile extending in a longitudinal direction and delimiting an internal space. The track profile has a longitudinal opening for accessing the internal space from an outside. The luminaire track further has an electric connection element extending within the internal space preferably along the longitudinal direction to be electrically accessible (i.e. from or via the internal space). The luminaire system further comprises an electronic device according to the present invention as described herein above. The electronic device is edgewise inserted via the opening in the internal space at a defined insertion position obtained upon physical contact of the stopper section of the spacer with an abutment section of the track profile being opposite to the longitudinal opening so that the electric contact and the electric connection element can get into (or even are in) electric connection, and so that preferably, if present, the grounding pin can be (or is) in functional engagement with a grounding section of the luminaire track either directly or, e.g. if made of an electrically conductive material, via the spacer.

[0025] Hence, the spacer allows for a defined insertion positioning of the electronic device in the internal space of the longitudinal track profile of a luminaire track to thus allow for an easy electric connection of the electronic device with a luminaire track. In combination with the movably provided grounding pin as an optional feature, an easy and secure grounding can be obtained at the same time.

[0026] The abutment section and the grounding section can be the same (i.e. nearby or even (partially) overlapping each other) or even identical (the latter, for instance, in case the grounding is obtained via the electrically conducting spacer). Hence, the track profile can be simplified and, when using an electronic device in which the grounding pin is guided within the through hole of the spacer, the whole layout can be provided in a space-saving manner.

[0027] The luminaire system may further comprise a light source, like an LED light source, being electrically connected or connectable to the electronic component for operating the light source. Of course, also other electric components can be provided to be electrically connected to the electronic component, e.g., for operating the same, like sensors, speakers, and the like.

[0028] According to another aspect, the present invention is further directed to a kit comprising an electronic device or even a luminaire system according to the present invention as described herein above. The kit further comprises a plurality of said spacers, having a different layout so as to protrude with the stopper section

from the edge in the extension direction to different extends, when being attached to the housing, respectively, wherein the different extends are preferably selected from the group of the extend being equal to and less than the exposed position of the grounding pin.

[0029] By providing a corresponding kit, the user can easily lay out the electronic device in a manner suitable for being used with the corresponding luminaire track and its longitudinal track profile. Hence, the electronic device can be easily and securely used in a wide range of luminaire track layouts while always allowing for secure electrical connection and preferably also grounding connection. Hence, with very simple means, the electronic device can be individualized according to the given needs defined by the luminaire track layout.

[0030] According to a further aspect, the present invention is directed to a method for inserting an electronic device in a luminaire track, comprising the steps of:

- a) providing a luminaire track having a longitudinal track profile extending along a longitudinal direction and delimiting an internal space, the track profile having a longitudinal opening for accessing the internal space from an outside, and an electric connection element extending within the internal space along the longitudinal direction to be electrically accessible,
- b) providing an electronic device according to any one of claims 1 to 9,
- c) edgewise inserting the electronic component in the internal space up to a defined insertion position obtained upon physical contact of the spacer with a stopper section of the track profile opposite to the longitudinal opening, so that

- c1) the electric contact and the electric connection element are in a relative position to each other to be in or to allow for getting into electric connection with each other, and
- c2) preferably, if present, the grounding pin is in functional engagement with a grounding section of the luminaire track either directly or, e.g. if made of an electrically conductive material, via the spacer.

[0031] With the method according to the present invention, an electronic device can be easily inserted in a luminaire track in a secure and easy manner while allowing for an increased aesthetic appearance due to the electronic device being preferably fully inserted in the luminaire track. At least, the housing of the electronic device does not require a widened or bulged out and thus unaesthetic section due to the kind of internal (i.e. hidden within the internal space of the luminaire track) spacer to allow for a defined insertion positioning of the electronic device. If present, the movably provided grounding pin further allows for a secure grounding connection.

[0032] The electric contact is preferably selectively

brought into electric connection with electric connection element after the electronic device has reached the defined insertion position. This can, for instance, be achieved by the electric contact being provided in a selectively retractable manner. Thereby, the outer dimensions of the electronic device can be temporarily reduced, thus facilitating the insertion of the electronic device into the internal space of the luminaire track.

[0033] A light source, like an LED light source, can be electrically connected to the electronic device, preferably via the connection section, for operating the light source.

[0034] Of course, also any other electric or electronic components may be electrically connected to the electronic device, e.g. for operating the same. The light source (or any other electric or electronic component) is preferably mechanically connected to the track profile to thus securely attach this element to the track profile.

[0035] Further features, details and advantages of the present invention will now be described by the embodiments exemplarily represented by the drawings of the enclosed Figures.

Figure 1 shows a perspective view of an electronic device for operating a light source according to a first embodiment of the present invention,

Figure 2 shows a partially exploded view of the electronic device of Figure 1,

Figure 3 shows a perspective and partially cross-sectional view of a luminaire system according to an embodiment of the present invention with an electronic device according to Figure 1,

Figure 4 shows a cross-sectional front-side elevation view of the luminaire system of Figure 3,

Figure 5 shows a cross-sectional front-side elevation view of a luminaire system according to another embodiment of the present invention,

Figure 6 shows a partial perspective view of an electronic device for operating a light source according to another embodiment of the present invention,

Figure 7 shows a cross-sectional front-side elevation view of a luminaire system according to another embodiment of the present invention with an electronic device according to Figure 6, and

Figure 8 shows a cross-sectional front-side elevation view of a luminaire system according to another embodiment of the present invention.

[0036] The Figures show different embodiments of an electronic device 1 for operating a light source 2, like an LED-light source, according to the present invention.

[0037] The electronic device 1, comprises an electronic component 3. The electronic component can, for instance, be a driver for an LED- light source. Of course, the electronic component 3 may also comprise any other type of electronic component, e.g. for operating the light source 2.

[0038] The electronic device 1 further comprises a flat housing 4 having two opposite side walls 40 connected by a circumferential edge 41 to delimit an inner space 42 for enclosing and carrying the electronic component 3. According to the preferred embodiments as shown in the enclosed Figures, the side walls 40 both preferably extend substantially in parallel with respect to the same plane. The housing can be made of an electrically insulating material, like plastic.

[0039] The electronic device 1 further comprises an electric contact 5 being electrically connectable or connected to the electronic component 3 to allow for external electrical connection of the electronic component. The electric contact 5 may protrude from the housing 4. The electric contact 5 can thus be used as a plug-like element. Alternatively, the electric contact 5 can also be a socket-like element for receiving a corresponding external electric contact element. In the former case, the electric contact 5 may extend from the housing 4, preferably from one of its side walls 40, to allow for external electrical connection of the electronic component 3, as can be exemplarily seen in Figure 5. In a preferred embodiment, the electric contact 5 is designed to be selectively retractable to allow for an edgewise insertion (i.e. in a direction along the flat extension of the housing 4 or perpendicular to the edge 41) of the electronic device 1 in a longitudinal luminaire track 10.

[0040] The electronic device 1 may optionally further comprises a grounding pin 6 being functionally connected to the electronic component 3 and being movably provided along a moving direction M between an exposed position (exemplarily shown in Figure 4) projecting from the edge 41 and a retracted position (exemplarily shown in Figure 5 and 7) in which the grounding pin 6 projects less (i.e. compared to the exposed position) from or is substantially flush with the edge 41. The grounding pin 6 is preferable biased to or towards the exposed position. This can, for instance, be obtained by a spring means 8, which is here exemplarily shown as a coil spring provided about the grounding pin 6 and being supported on its one side at a supporting area 43 (here of the housing 4) and on the other side towards its external tip portion at a (here flange-like) support section 61 of the grounding pin 6. To avoid the grounding pin 6 from getting lost, the supporting section 61 is preferably a widened section getting into abutment with a second supporting area 44 of the housing 4 in the exposed position of the grounding pin 6. Therefore, the grounding section 60 of the grounding pin 6 protruding (or intended to protrude) from the housing

4 extends through a through hole 45 of the housing 4 having a diameter being larger than the diameter of the grounding section 60 of the grounding pin 6 and being smaller than the diameter of the supporting section 61 of the grounding pin 6. As can be seen in Figures 4, 5, 7 and 8, the grounding pin 6 here exemplarily comprises a rear extension portion 62 extending inside the housing 4 and being in sliding (electric) contact with an electric contact member 30 of the electronic component 3 so that the grounding pin 6 is always in functional connection to the electronic component 3, i.e. in electric connection, irrespective of its position between the retracted and exposed position. This functional connection can, of course, also be otherwise obtained. In a preferred embodiment, the electric contact member 30 is biased towards the grounding pin 6 in a direction here preferably orthogonal to the moving direction M (e.g. as being itself provided as a spring member) to allow for a secure functional connection between the grounding pin 6 and the electronic component 3.

[0041] The electronic device 1 further comprises a spacer 7 being detachably attachable or attached to the housing 4 so as to protrude with a stopper section 70 from the edge 41 in an extension direction E, preferably being in parallel to an edgewise insertion direction of the electronic device, which in turn is preferably in parallel to a plane of extension of the flat housing. If the a grounding pin 6 is present, the extension direction E may be in parallel to the moving direction M.

[0042] The spacer can also be made of an electrically insulating material. However, according to an embodiment as shown in Figures 6 and 7, the spacer 7 can also be made of an electrically conducting material, like metal sheet. This allows for the spacer be used for grounding even without the provision of a grounding pin 6. Therefore, the spacer 7 made of an electrically conducting material is preferably (electrically) connected to the electronic component 3. This can be obtained by direct connection or, alternatively and according to the shown preferred embodiment, by the grounding pin 6. The grounding pin 6 can thus be provided in a moveably manner as described herein above and is in functional (i.e. electrical) connection with the spacer 7, which in turn is designed to protrude and thus be able to get into abutment (i.e. physical contact) with a track profile 11 into which the electronic device 1 is to be inserted, as described in more detail herein below. For instance, the spacer 7 may extend over the grounding pin 6, i.e. across its moving direction M, with a top cover section 75 so that the preferably biased grounding pin 6 lies in secure abutment at the electrically conducting spacer 7 as shown in Figures 6 and 7, to thus provide a secure functional connection between the mentioned components to allow for a secure grounding function. Hence, the grounding pin 6 is in functional connection with the electronic component 3 via the electric contact member 30. The grounding pin 6 is then in functional connection with the electrically conductive spacer 7 via its top cover section 74 from which the stop-

per section (here two stopper sections) 70 protrude in the extension direction E. The spacer 7 be made of a metal sheet can thus be easily produced by simple stamp and bent process.

[0043] If the grounding pin 6 is present, the stopper section 70 can protrude from the edge 41 in the extension direction at most up to the exposed position, as can be seen, for instance, in Figure 4. As can be seen, for instance, in Figures 1 and 2, the stopper section 70 preferably has a pin-like shape. The stopper section 70 may also have any other shape, like a spike or flat plate-like shape or the like, as exemplarily shown in Figures 6 and 7. The latter shape can be easily provided, if the stopper 7 is made of a metal sheet. The stopper section may preferably have an angled (e.g. square, rectangular, etc.) or round (e.g. circular, oval, etc.) or any other kind of cross-sectional shape when seen in the extension direction E.

[0044] The spacer 7, preferably the stopper section 70, may comprise a through-hole 71 extending along the moving direction M in which the grounding pin 6 is movably received. As can be seen, for instance, in Figure 4, the grounding pin 6 is preferably movably guided within said through-hole 71. In case of the embodiment of Figures 6 and 7, in which the spacer 7 forms (at least part of) a grounding feature of the electronic device 1, the spacer may also be structurally closed above/across the grounding pin 6; e.g. here by the closed top cover section 75.

[0045] The spacer 7 may further comprise a first engagement structure 72 being in detachable engagement with a corresponding second engagement structure 46 of the housing 4 for detachably attaching the spacer 7 to the housing 4. As can be clearly seen in Figures 1, 4, 6 and 7, the spacer 7 may comprise a holding section 73 to span or extend between the two opposite side walls 40 across the edge 41. Therefore, the holding section 73 may preferably comprise engagement sections 74 extending along part of the side walls 40, e.g. to clamp the spacer 7 onto the housing 4. The holding section 73 may preferably have a U-shaped layout, as can be clearly seen in Figures 2 and 4. This layout allows for a space-saving and secure attachment of the spacer 7 onto the housing 4. The holding section 73 and preferably the engagement sections 74 may preferably comprise the first engagement structure 72, as exemplarily shown in Figure 7.

[0046] The electronic device 1 may further comprise a light source being electrically connectable or connected with the electronic component 3 for thus operating said light source. Additionally or alternatively, the electronic device 1 may also comprise a connection section (not shown) for electrically connecting a light source with the electronic component 3 for operating the light source. The light source can preferably be an LED light source. Of course, any other type of electric or electronic component can be connected to the connection section in the same manner.

[0047] Now, with reference to Figures 3 to 5, 6 and 7, luminaire systems 100 according to the present invention are exemplarily described. The luminaire system 100 of the present invention comprises a luminaire track 10 having a longitudinal track profile 11 extending along a longitudinal direction L and delimiting or enclosing an internal space 12. The track profile 11 has a longitudinal opening 13 for accessing the internal space 12 from an outside A. The luminaire track 10 further comprises an electric connection element 14, here exemplarily shown in the form of an electric wire 140 preferably provided within an electric wire holding section 141. The electric connection element 14 preferably extends within the internal space 12 along the longitudinal direction L to be electrically accessible, here from or via the internal space 12.

[0048] The luminaire system 100 further comprises the electronic device 1 according to the present invention. As can be clearly seen in Figures 3 to 5, 6 and 7, the electronic device 1 is edgewise inserted via the opening 13 in the internal space 12 at a defined insertion position obtained upon physical contact of the stopper section 70 of the spacer 7 with an abutment section 15 of the track profile 11 opposite to the longitudinal opening 13, so that the electric contact 5 and the electric connection element 14 can get into electric connection with each other, and so that preferably, if present, also the grounding pin 6 is in functional engagement with a grounding section 16 of the luminaire track 10, preferably of the track profile 11, either directly (as exemplarily shown in Figure 5) or via the spacer 7 (as exemplarily shown in Figure 7).

[0049] As can be clearly seen in Figures 4 and 5, the abutment section 15 as well as the grounding section 16 can be the same or even, as exemplarily shown in Figure 7, identical, thus allowing for a most compact layout of the whole system 100.

[0050] The luminaire system 100 may further comprise a light source, like an LED light source, or any other kind of electric or electronic component being electrically connected to the electronic component 3, e.g. for operating the light source or other electric/electronic element, respectively.

[0051] With particular reference to Figures 1 and 2, but also clearly derivable from Figures 3 to 8, the present invention is also directed to a kit comprising the electronic device 1 or even the luminaire system 100 according to the present invention and having a plurality of said spacers 7 having a different layout so as to protrude with its stopper section 70 from the edge 41 in the extension direction E to different extents when being attached to the housing 4, respectively.

[0052] The different extents are preferably selected from the group of the extent being equal to and less than the exposed position. Of course, the electronic device 1 can also be used without any additional spacer 7; the spacer 7 can then be given by the structural layout of the housing 4 itself (here by the upper side of the edge 41). For particular reason, e.g. guiding function, a kind of blind spacer 7 could be provided in which the stopper section

70 is simply provided by a top cover section 75 of the spacer 7 simply having a corresponding through-hole 71 for direct grounding function (e.g. according to embodiment of Figure 5) or having a closed top cover section for indirect grounding via the grounding pin 6 (e.g. according to embodiment of Figure 8) or even for direct grounding via the electrically conductive spacer 7 itself.

[0053] In the following, a method for inserting an electronic device 1 in a luminaire track 10 is described.

[0054] In the first step, a luminaire track 10 is provided having a longitudinal track profile 11 extending along the longitudinal direction L and delimiting an internal space 12, wherein the track profile 11 has a longitudinal opening 13 for accessing the internal space 12 from the outside A, and further having an electric connection element 14 extending within the internal space 12 along the longitudinal direction L to be electrically accessible.

[0055] In a second step, the electronic device 1 according to the present invention is provided.

[0056] In a third step, the electronic device is edgewise inserted in the internal space 12 up to a defined insertion position obtained upon physical contact of the stopper section 70 of the spacer 7 with the abutment section 15 of the track profile 11 being opposite to the longitudinal opening 13, so that the electric contact 5 and the electric connection 14 are in a relative position to each other to be in or to allow for getting into electric connection with each other, and preferably so that, if present, the grounding pin 6 is in functional engagement with the grounding section 16 of the luminaire track. Therefore, if a kit according to the present invention is provided, a spacer 7 can be selected from a group of spacers 7 which allows best for the corresponding insertion or relative positioning in accordance with the layout of the given track profile 11.

[0057] The electric contact 5 can be selectively brought into electric connection with the electric connection element 14 after the electronic device 1 has reached the defined insertion position. Therefore, the electric contact 5 can be designed to be selectively retractable and then again moved out.

[0058] The light source, like the LED light source, can be electrically connected to the electronic device 1, preferably by another connection section, for operating the light source 2. In a preferred embodiment, the light source 2 - like any other electric or electronic component - can preferably be mechanically connected to the track profile 11.

[0059] The present invention is not limited by the embodiments described herein above, as long as being covered by the appended claims.

Claims

1. Electronic device (1) for operating a light source (2), like an LED light source, comprising:

- an electronic component (3),
 a flat housing (4) having two opposite side walls (40) connected by a circumferential edge (41) to delimit an inner space (42) for enclosing and carrying the electronic component (3),
 an electric contact (5) being electrically connected to the electronic component (3) to allow for external electrical connection of the electronic component (3), and
 a spacer (7) being detachably attachable to the housing (4) so as to protrude with a stopper section (70) from the edge (41) in an extension direction (E).
2. Electronic device (1) according to claim 1, further comprising a grounding pin (6) being functionally connected to the electronic component (3) and being moveably provided along a moving direction (M) between an exposed position projecting from the edge (41) and a retracted position in which the grounding pin (6) projects less from or is substantially flush with the edge (41),
 wherein the extension direction (E) preferably is in parallel to the moving direction (M), and/or
 wherein the grounding pin (6) is preferably biased to or towards the exposed position.
3. Electronic device (1) according to claim 2, wherein the spacer (7), preferably the stopper section (70), comprises a through hole (71) along the moving direction (M) in which the grounding pin (6) is moveably received, preferably moveably guided, and/or
 wherein the stopper section (70) protrudes from the edge (41) in the extension direction (E) at most up to the exposed position.
4. Electronic device (1) according to any one of the preceding claims, wherein the stopper section (70) has a pin-like shape, spike or plate-like shape, and/or
 wherein the stopper section (70) has an angled or round cross section when viewed in the extension direction (E).
5. Electronic device (1) according to any one of the preceding claims, wherein the spacer (7) comprises a first engagement structure (72) being in detachable engagement with a corresponding second engagement structure (46) of the housing (4) for detachably attaching the spacer (7) to the housing (4).
6. Electronic device (1) according to any one of the preceding claims, wherein the spacer (7) comprises a holding section (73) to span or extend between the two opposite side walls (40) across the edge (41),
 wherein the holding section (73) preferably comprises engagement sections (74) extending along part of the side walls (40), and/or
 wherein the holding section (73) preferably has a U-shaped layout, and/or wherein the holding section (73), preferably the engagement sections (74), preferably comprises the first engagement structure (72).
7. Electronic device (1) according to any one of the preceding claims,
 wherein the electric contact (5) extends from the housing (4), preferably from one of the side walls (40) thereof, to allow for external electrical connection of the electronic component (3), and/or
 wherein the electric contact (5) is designed to be selectively retractable to allow for an edgewise insertion of the electronic device (1) in a longitudinal luminaire track (10).
8. Electronic device (1) according to any one of the preceding claims, further comprising a light source (2) being electrically connected with the electronic component (3) and/or a connection section for electrically connecting a light source with the electronic component (3) for operating the light source, the light source (2) preferably being an LED light source.
9. Electronic device (1) according to any one of the preceding claims,
 wherein the side walls (40) both extend substantially in parallel with respect to the same plane, and/or
 wherein the housing (4) is made of an electrically insulating material, like plastic, and/or
 wherein the spacer (7) is made of an electrically insulating material, like plastic, or an electrically conducting material, like metal sheet.
10. Luminaire system (100) comprising:
 a luminaire track (10) having
 • a longitudinal track profile (11) extending along a longitudinal direction (L) and delimiting an internal space (12), the track profile (11) having a longitudinal opening (13) for accessing the internal space (12) from an outside (A), and
 • an electric connection element (14) extending within the internal space (12) along the longitudinal direction (L) to be electrically accessible, and
 an electronic device (1) according to any one of the preceding claims,
 wherein the electronic device (1) is edgewise inserted via the opening (13) in the internal space (12) at a defined insertion position obtained upon physical contact of the stopper section (70) of the spacer (7) with an abutment section (15) of the track profile (11) opposite to the longitudinal opening (13), so that

- the electric contact (5) and the electric connection element (14) can get into an electric connection, and
 - preferably, if present, the grounding pin (6) is in functional engagement with a grounding section (16) of the luminaire track (10) either directly or via the spacer (7).
11. Luminaire system (100) according to claim 10, wherein the abutment section (15) and the grounding section (16) are the same or identical.
12. Luminaire system (100) according to claim 10 or 11, further comprising a light source (2), like an LED light source, being electrically connected to the electronic component (3) for operating the light source (2).
13. Kit comprising an electronic device (1) according to any one of claims 1 to 9 or a luminaire system (100) according to any one of claims 10 to 12, and having a plurality of said spacers (7) having a different layout so as to protrude with its stopper section (70) from the edge (41) in the extension direction (E) to different extents when being attached to the housing (4), respectively, wherein the different extents are preferably selected from the group of the extent being equal to and less than the exposed position.
14. Method for inserting an electronic device (1) in a luminaire track (10), comprising the steps of:
- d) Providing a luminaire track (10) having a longitudinal track profile (11) extending along a longitudinal direction (L) and delimiting an internal space (12), the track profile (11) having a longitudinal opening (13) for accessing the internal space (12) from an outside (A), and an electric connection element (14) extending within the internal space (12) along the longitudinal direction (L) to be electrically accessible,
 - e) Providing an electronic device (1) according to any one of claims 1 to 9,
 - f) Edgewise inserting the electronic device (1) in the internal space (12) up to a defined insertion position obtained upon physical contact of the stopper section (70) of the spacer (7) with an abutment section (15) of the track profile (11) opposite to the longitudinal opening (13), so that
- ci)
- the electric contact (5) and the electric connection element (14) are in a relative position to each other to be in or to allow for getting into electric connection with each other, and
 - c2) preferably, if present, the grounding pin (6) is in functional engagement with a grounding section (16) of the luminaire track

(10) either directly or via the spacer (7).

15. Method according to claim 14, wherein the electric contact (5) is selectively brought into electric connection with the electric connection element (14) after the electronic device (1) has reached the defined insertion position, and/or wherein a light source (2), like an LED light source, is electrically connected to the electronic device (1), preferably via the connection section, for operating the light source (2), wherein the light source (2) is preferably mechanically connected to the track profile (11).

Fig. 1

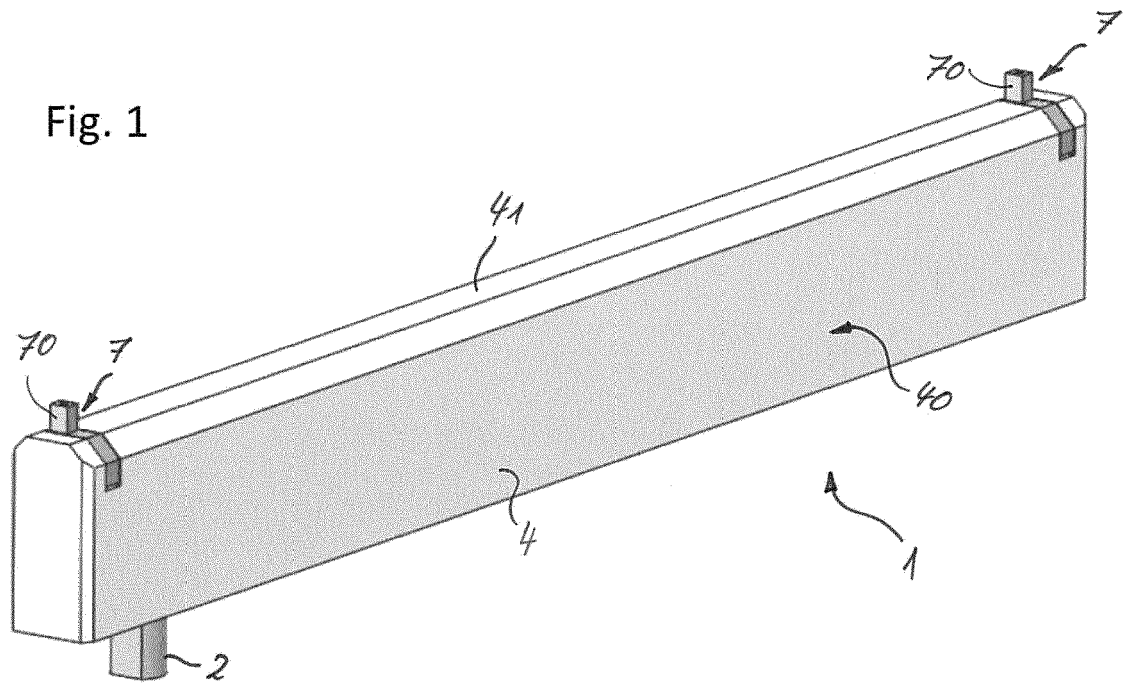


Fig. 2

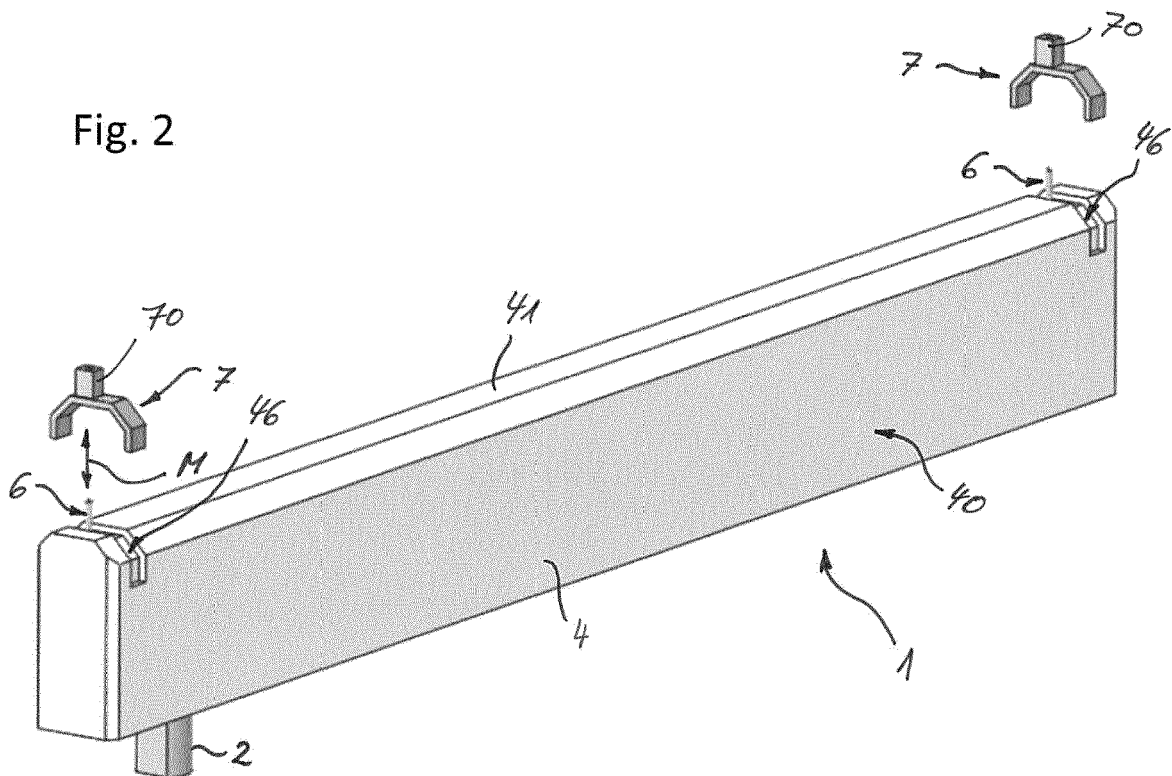


Fig. 3

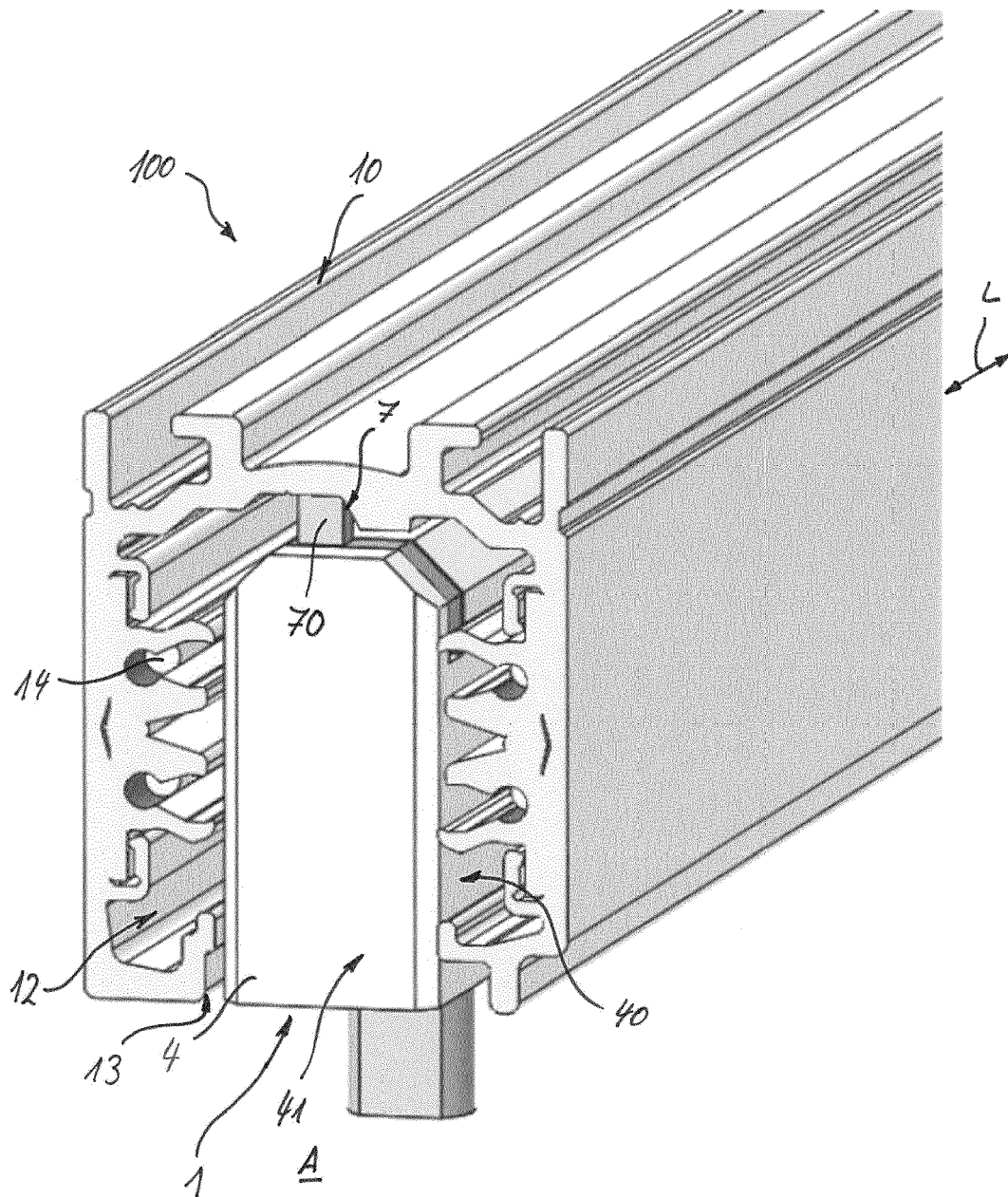


Fig. 4

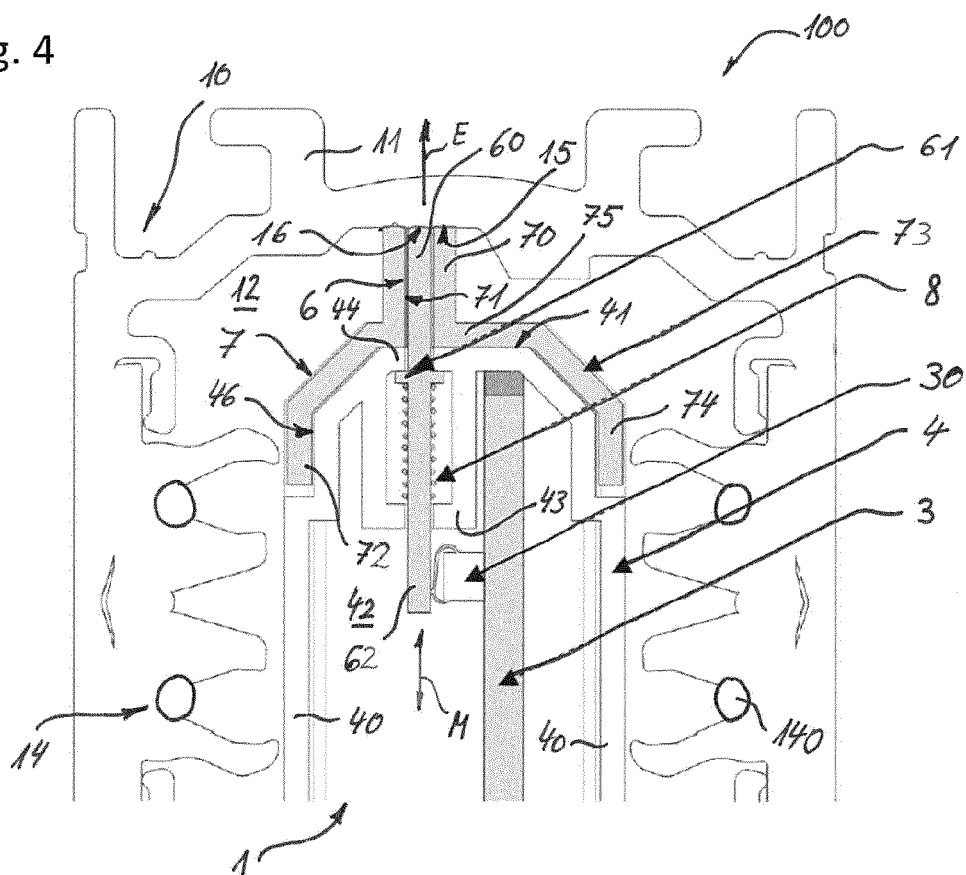


Fig. 5

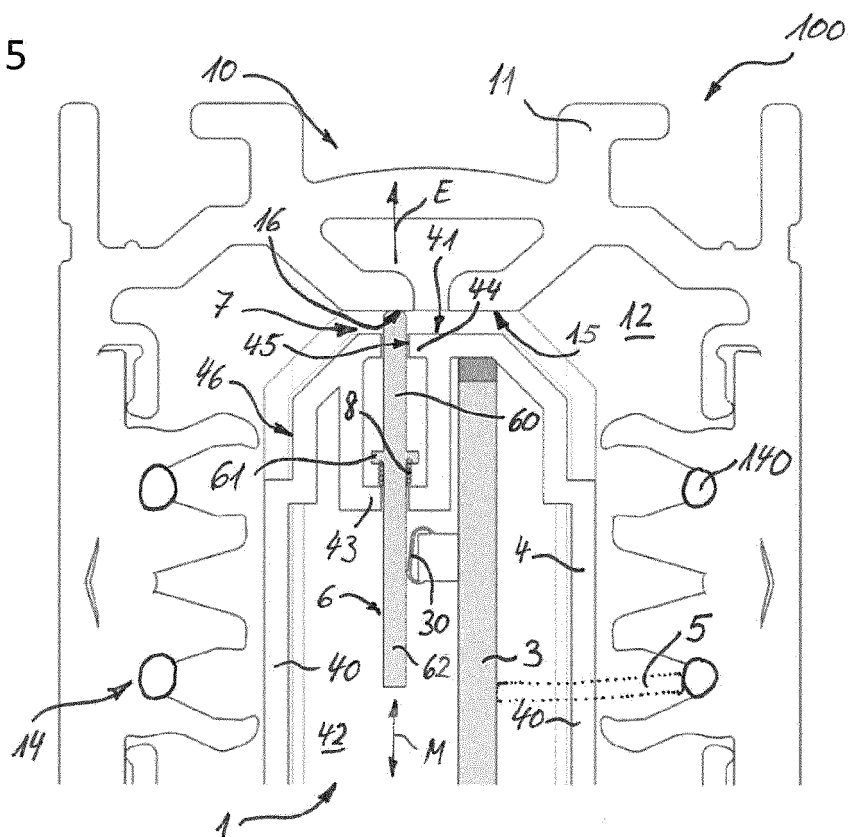


Fig. 6

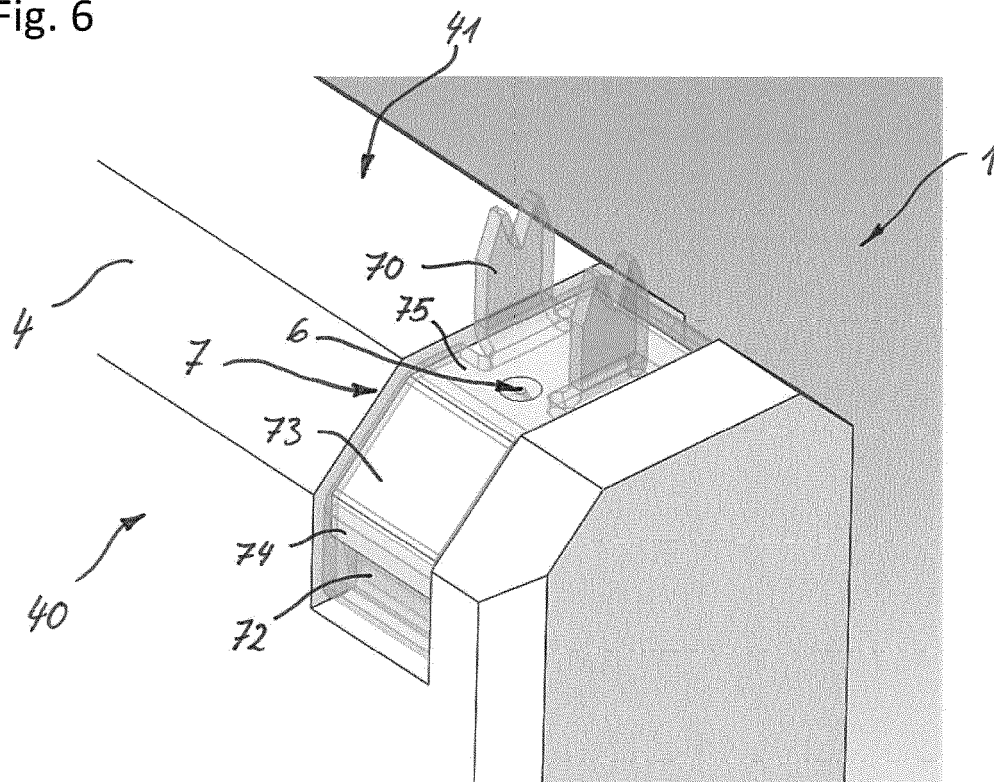


Fig. 7

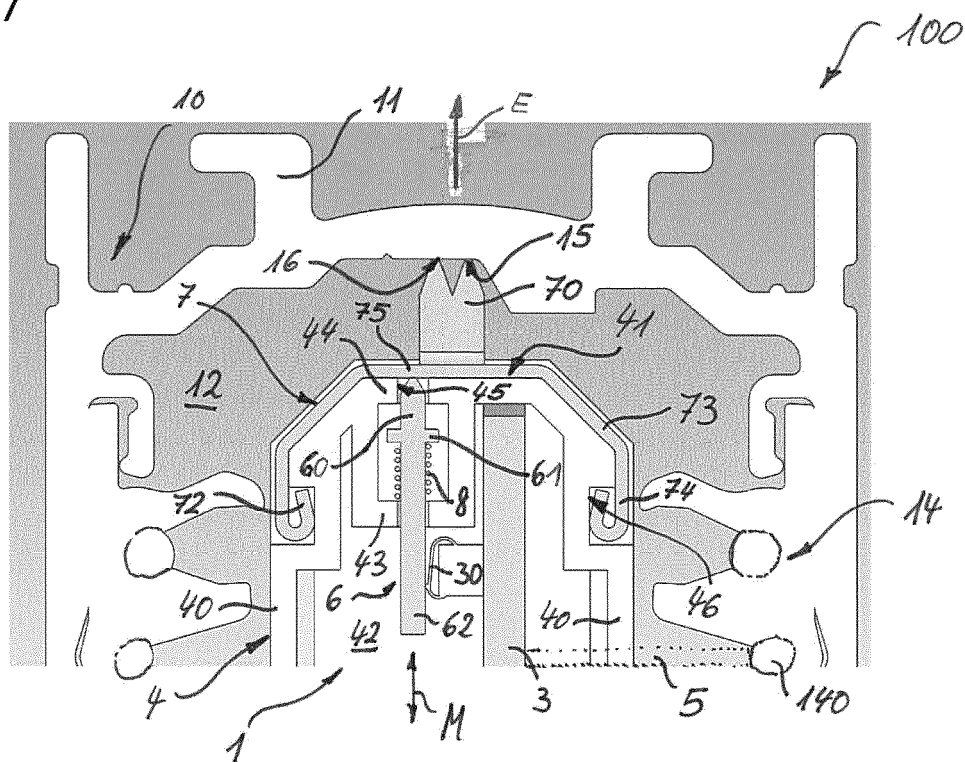
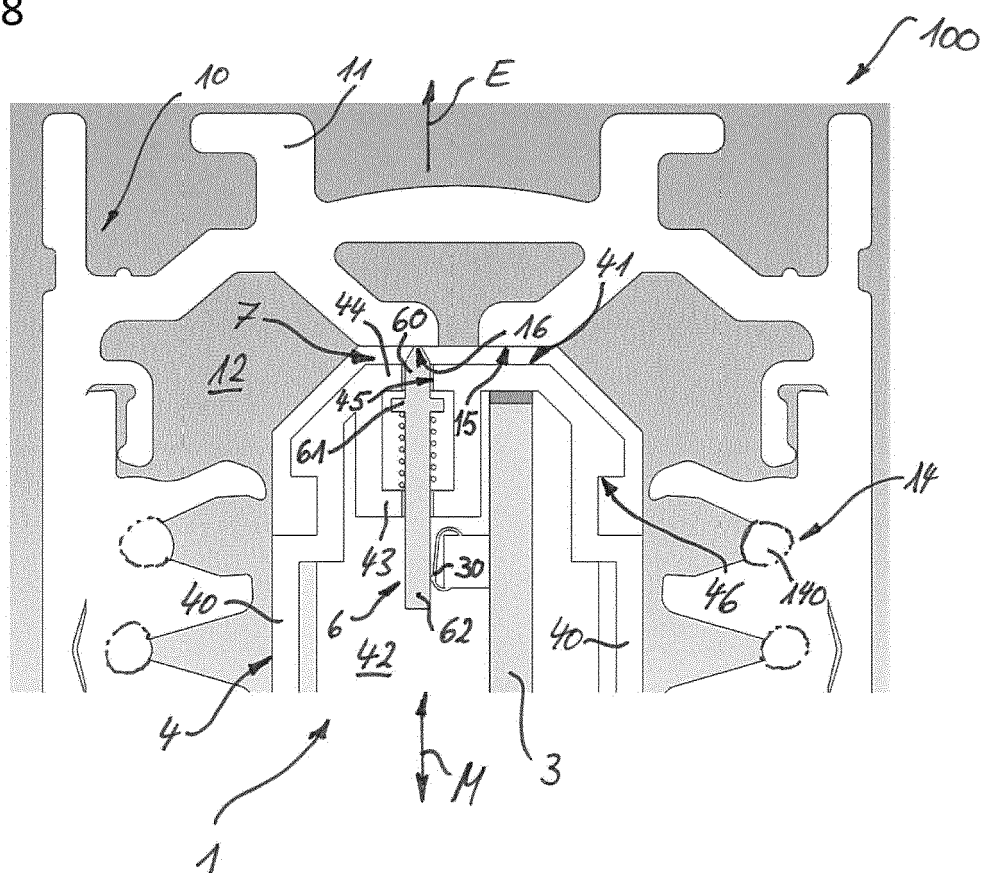


Fig. 8





EUROPEAN SEARCH REPORT

Application Number
EP 20 15 2395

5

10

15

20

25

30

35

40

45

50

55

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	US 2007/058377 A1 (ZAMPINI THOMAS L II [US] ET AL) 15 March 2007 (2007-03-15) * paragraphs [0083] - [0092]; figures 1-6 * paragraphs [0096], [0099]; figures 10, 13-15 *	1,4,5, 7-9,13	INV. F21V17/00 F21V21/35 F21V23/00
X	EP 3 296 619 A1 (OSRAM GMBH [DE]; OSRAM SPA [IT]) 21 March 2018 (2018-03-21) * paragraphs [0025] - [0028]; figure 1 * * paragraphs [0041] - [0042]; figure 4 * * paragraph [0067]; figure 13 *	1,4-6,8, 9,13	
X	WO 2016/015503 A1 (CE LIGHTING LTD [CN]) 4 February 2016 (2016-02-04) * the whole document *	1,4,5, 7-9,13	
A	US 10 505 296 B1 (HUANG CHING FU [TW]) 10 December 2019 (2019-12-10) * the whole document *	1-15	
A	US 10 116 108 B1 (VIDAL GUILLAUME [FR] ET AL) 30 October 2018 (2018-10-30) * column 2, line 66 - column 5, line 3; figures 2a-6 *	1-15	TECHNICAL FIELDS SEARCHED (IPC) F21V H01R
A	GB 2 140 983 A (PROFILUX SRL) 5 December 1984 (1984-12-05) * page 2, lines 90-100; figures 1-5 *	1-15	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 June 2020	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	

EPO FORM 1503 03.82 (P04C01)

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

EP 20 15 2395

5

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-06-2020

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007058377 A1	15-03-2007	US 2007058377 A1	15-03-2007
		US 2009310354 A1	17-12-2009
EP 3296619 A1	21-03-2018	EP 3296619 A1	21-03-2018
		US 2018080637 A1	22-03-2018
WO 2016015503 A1	04-02-2016	CN 104089206 A	08-10-2014
		WO 2016015503 A1	04-02-2016
US 10505296 B1	10-12-2019	NONE	
US 10116108 B1	30-10-2018	NONE	
GB 2140983 A	05-12-1984	BE 899532 A	16-08-1984
		CH 658942 A5	15-12-1986
		DE 3415899 A1	31-10-1984
		FR 2545288 A1	02-11-1984
		GB 2140983 A	05-12-1984