

(19)



(11)

EP 2 375 147 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

27.10.2021 Bulletin 2021/43

(51) Int Cl.:

F21S 9/02 ^(2006.01)

F21V 15/015 ^(2006.01)

F21V 17/06 ^(2006.01)

F21V 23/00 ^(2015.01)

F21V 17/00 ^(2006.01)

F21V 23/04 ^(2006.01)

F21Y 103/00 ^(2016.01)

(21) Application number: **10250751.4**

(22) Date of filing: **09.04.2010**

(54) Control module for elongated lamp

Steuerungsmodul für gestreckte Lampe

Module de commande pour lampe allongée

(84) Designated Contracting States:

**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 SE SI SK SM TR**

(43) Date of publication of application:

12.10.2011 Bulletin 2011/41

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Description

[0001] The present invention is directed to a luminaire arrangement with an oblong luminaire and an enhancement module for functional enhancement of the oblong luminaire.

[0002] Oblong luminaires are well known in the lighting industry and are commercially available for a variety of applications. For example, US 2009/046457, US 2008/0259599, US 2005/0073838, WO 2008/004825, GB 817,514 and US 3,336,472 disclose different oblong luminaires. Especially for the lighting of interior areas a number of respective luminaire models is available. For industrial or commercial areas the use of cost efficiently designed luminaires is common. In US 2002/0118537 A1 a modular lighting unit is shown, with at least one modular oblong luminaire unit, whereby multiple luminaire units can be put together, and with a power module which is attached to one luminaire unit at an end face, and whereby the power module comprises a switch to connect or disconnect the power supply cord. These luminaires are usually provided with a basic functionality, lacking the possibility to adapt the light emission to various needs, which might arise when the dedication of space is changed.

[0003] In this case, exchanging respective luminaires or enhancing their functionality is usually unavoidable. Hence substantial efforts are required mounting to significant costs.

[0004] Exchanging luminaires with an improved model requires a significant time and is usually obviated wherever possible. Further, adapting luminaires to a changed application is likewise tedious, in many cases owed to the fact that solutions to improve the functionality require sophisticated fitting of additional devices, i.e. special ballasts, to a luminaire or the proximity thereof, resulting in a complex installation process. Moreover the enhancement of a certain luminaire model might be inconceivable, since the assembly might not provide the opportunity to incorporate necessary devices, frequently due to safety and security reasons. In most cases these constraints apply to small or oblong luminaires.

[0005] Accordingly, it is an object of the present invention to improve the possibility to enhance the operational functions of an oblong luminaire, especially raising the opportunity to adapt an oblong luminaire to a variety of applications.

[0006] This object is solved by a luminaire arrangement with an oblong luminaire and an enhancement module for the oblong luminaire according to claim 1. Advantageous modifications of the present invention are subject matter of the depending claims.

[0007] According to the invention a luminaire arrangement with an oblong luminaire and an enhancement module for the functional enhancement of the oblong luminaire is provided. The enhancement module is removable and arranged at the narrow end face of the oblong luminaire and comprises a housing, formed to combine

with a narrow end face of the oblong luminaire, and further controller means, arranged to control operational functions of the oblong luminaire, and sensors means arranged to generate a control signal. The enhancement module is arranged to control operational functions of the oblong luminaire based on control signals, generated by the sensor means, and subsequently processed by the enhancement module. The enhancement module is formed to detect the loss of power supply for the oblong luminaire, and the controller means are arranged to connect the oblong luminaire to an emergency power supply subsequently to the loss of power supply. The housing of the enhancement module is formed to complete the end face of the housing of the oblong luminaire form-fittingly and in particular entirely.

[0008] Aided by respective controller means a variety of enhancements is conceivable, ranging from appropriate engagement of the luminaire by controlling and varying switching times to many other enhancements, in particular requiring the extension of mounting space or openly accessible housing faces. According to the invention, the functionality of an emergency luminaire is realized benefiting from the enhancement module. Preferably adding remote controllable functionality and modifying the light distribution is realized benefiting from the enhancement module.

[0009] Advantageously the enhancement module is combined to the oblong luminaire, with major faces - preferably three or more faces - of the respective enhancement module housing remaining accessible after installation, implying that major elements of the enhancement module preferably the controller means are arranged beyond the space enclosed by the housing of the oblong luminaire according to its original design. For certain applications it is favorable that the enhancement module comprises a ballast, preferably also arranged beyond said space.

[0010] The inventive enhancement module is provided also with the benefit of creating the possibility for small or narrow luminaire assemblies to enhance their functionality. Advantageously the oblong luminaire imposes a base element for a readily achievable fitting of the enhancement module - as sketched above with major elements beyond the base element.

[0011] As already mentioned above, the housing of the enhancement module is formed to complete the end face of the housing of the oblong luminaire form-fittingly. Advantageously the other faces of the enhancement module remain accessible when fitted to the luminaire. Combining form-fittingly with the oblong luminaire the enhancement module can be regarded as a continuation in shape, favorably improving the optical appearance of the luminaire and enhancement module combination. Further a number of benefits for the combination process of oblong luminaire and enhancement module arise.

[0012] Preferably the enhancement module completes an end face of the oblong luminaire entirely. Especially the possibility to combine the enhancement module elec-

trically with the oblong luminaire is aided. Respective end faces of the oblong luminaire can be arranged to be protruded or removed without corrupting the appearance of the luminaire. Moreover, as the luminaire serves as a base element to combine with the enhancement module, sufficient stability is provided to facilitate the fitting to the oblong luminaire.

[0013] Further facilitating the combination of enhancement module and oblong luminaire, the enhancement module comprises accommodation means, formed to combine with a lamp holder.

[0014] Preferably when using two enhancement modules at both ends of the oblong luminaire, it is conceivable to add a modified lamp holder providing the possibility to optimize the usage of illumination means. Cost efficient oblong luminaires preferably comprise a tubular fluorescent lamp. For certain applications, advantageously for the sake of energy saving purposes, it might be favorable to replace the respective lamp with LED lighting means. Accordingly, the enhancement module might be formed to add a lamp holder expedient to operate LED lighting means. A respective lamp holder might also be comprised in the enhancement module.

[0015] Favorably the oblong luminaire comprises a removable lamp holder, and advantageously the attachment means are formed to combine with the removable lamp holder of the oblong luminaire. Preferably the accommodation means are arranged to fit the respective lamp holder to an operating position stipulated by the original design of the oblong luminaire. Substantial advantages in combining the enhancement module electrically are achieved likewise.

[0016] In this modification of the invention, the exchange of ballasts originally comprised in the oblong luminaire can be obviated in most cases, providing a cost efficient solution for an enhancement of operational functions. Further, advantageously the wiring to the lamp holder is routed through the enhancement module creating the possibility to interfere electrically with the lighting means.

[0017] Moreover, to foster the electrical combination with the luminaire, the enhancement module comprises electrical connection means, formed to combine with the wiring or electrical connection means of the oblong luminaire.

[0018] In a preferred embodiment the enhancement module comprises connection means, arranged to electrically combine with a lamp holder, advantageously restricting electrical connection with the lamp holder to a defined polarity.

[0019] Further facilitating the combination of enhancement module and oblong luminaire, the accommodation means are formed to combine form-fittingly with the lamp holder, preferably by engagement of sliding means. Advantageously the accommodation means are provided with slots, in an example accommodating respective sliding means form fittingly.

[0020] Moreover, to improve the enhancement possi-

bilities the enhancement module comprises attachment means to combine with the oblong luminaire. In an embodiment the attachment means are represented by an oblong extension plate, preferably arranged to combine with a housing member of the oblong luminaire. However, other attachment means are also conceivable, for example the attachment means might be formed to be imposed on the narrow end face of the luminaire, preferably gliding, more preferably clamping. Further, in an embodiment, the attachment means might be arranged to accommodate luminaire members, advantageously in a clamping or gliding manner.

[0021] In a preferred embodiment the attachment means comprise snap-fitting or latching means to combine the enhancement module with the oblong luminaire in a reliable and safe manner. Preferably the snap fitting or latching combination is not detachable from the exterior of the luminaire and respectively the enhancement module is formed to avoid unintended modifications to the illumination system.

[0022] With adding the enhancement module to the luminaire, the possibility emerges to arrange a number of possible enhancements in a swift and efficient manner. The enhancement module is arranged to control operational functions of the oblong luminaire, based on control signals generated and subsequently processed by the enhancement module. Further, synergetically taking benefit of additional accessible housing faces provided by the enhancement module, the enhancement module preferably comprises sensor means to detect the presence of a person. Also the detection of motion of objects in the proximity of the enhancement module, aided by respective sensor means is conceivable.

[0023] According to the invention the sensor means generate a control signal, and preferably the controller means are arranged to initiate the lighting of the oblong luminaire when presence or motion is detected.

[0024] In a modified embodiment of the invention the enhancement module comprises sensor means to detect the ambient brightness, advantageously generating a control signal.

[0025] In an example the controller means are arranged to omit the lighting of the oblong luminaire when ambient brightness exceeds a predefined threshold level. Moreover, the threshold level might be adjustable to adapt to various environments. Further, it is also conceivable that the oblong luminaire is automatically lit, when ambient brightness is below a threshold level.

[0026] According to the present invention, the operational functionality of the oblong luminaire is enhanced to the demands of an emergency luminaire, benefiting from functions provided by the enhancement module. Therefore, the enhancement module is formed to detect the loss of power supply for the oblong luminaire, preferably generating a corresponding control signal.

[0027] The controller for example is formed to exhibit and control emergency functionality of a luminaire. According to the invention, the controller is arranged to light

the luminaire subsequent to the detection of power supply loss, to provide a basic illumination. In an advanced embodiment, the control signal of the motion or presence sensor means can be taken into account.

[0028] According to the invention the controller is formed to connect the oblong luminaire to an emergency power supply when the loss of power supply is detected. Advantageously the emergency power supply is comprised in the enhancement module, preferably formed of an accumulator or battery assembly, in an example arranged to be charged by the power supply of the respective oblong luminaire. However, other emergency power supply sources integral to the enhancement module or oblong luminaire are also conceivable, for example a capacitor arrangement.

[0029] Advantageously the enhancement module is formed to dim the intensity of light emitted by the oblong luminaire, preferably realized by the controller means. This proves especially efficient for energy saving purposes. Accordingly a variety of assemblies preferably comprising aforementioned modifications are conceivable. For example an enhancement module arranged for emergency lighting purposes can be formed to dim the light emission of the respective luminaire. Moreover, based on control signals of motion or presence sensor means, a dimming can be can be favorable for certain applications.

[0030] Further, also fostering the reduction of energy consumption, the enhancement module is formed to alter the number of light sources used for illumination. Preferably this can be realized by the controller means. For example the number of light sources used for emergency lighting can vary to the normal operation of the luminaire.

[0031] In a preferred modification of the invention the enhancement module comprises light sources, formed to illuminate an area in the proximity of the enhancement module. It is also conceivable that the additional light sources comprised in the enhancement module favorably contribute to the overall light emission of the luminaire, preferably highlighting special spots or obstacles.

[0032] Advantageously the enhancement module comprises a microprocessor, arranged to control operational functionality of the oblong luminaire. Preferably the microprocessor is formed to initiate and control a sequence of lighting functions of the oblong luminaire, according to a predefined sequence stipulated by a set of instructions and data processible by the microprocessor.

[0033] As an example, the predefined sequence might comprise a dimming sequence, mimicing the course of natural light.

[0034] According to the invention a method is provided for enhancing the operational functionality of an oblong luminaire, wherein the oblong luminaire is part of a luminaire arrangement and the luminaire arrangement comprises the oblong luminaire and an enhancement module. The method comprises the step of combining the enhancement module electrically with the oblong luminaire, and subsequently another step of combining the

enhancement module with a narrow end face of the oblong luminaire. According to the invention the enhancement module is removable and comprises a housing formed to combine with the narrow end face of the oblong luminaire, and further comprises controller means arranged to control operational functions of the oblong luminaire, and sensors means arranged to generate a control signal. The enhancement module is arranged to control operational functions of the oblong luminaire based on control signals, generated by the sensor means, and subsequently processed by the enhancement module, wherein the enhancement module is formed to detect the loss of power supply for the oblong luminaire, and the controller means are arranged to connect the oblong luminaire to an emergency power supply subsequently to the loss of power supply. The housing of the enhancement module is formed to complete the end face of the housing of the oblong luminaire form-fittingly and in particular entirely.

[0035] In an advantageous modification of the method the enhancement module is combined to the oblong luminaire while the oblong luminaire remains installed.

[0036] Preferably the method is facilitated by an oblong luminaire provided with a removable end cap. In this case the method can be modified to removing the removable end cap, favorably providing an aperture in the housing of the oblong luminaire, combining the enhancement module electrically with the oblong luminaire, and further combining the enhancement module with a narrow end face of the oblong luminaire, completing the margin provided by the removal of the end cap form fittingly.

[0037] In the following, the present invention and preferred embodiments thereof are explained in more detail with respect to the enclosed drawing. It is shown in

Fig. 1 an enhancement module according to the invention and an oblong luminaire to be combined;

Fig. 2 an embodiment of an enhancement module comprising sensor means and a removable lamp holder,

Fig. 3 a detailed view of an embodiment of the enhancement module; and

Fig. 4 a detailed view on electrical connection means.

[0038] Owners of commercial environments frequently face the task to change the dedication of facilities to adapt to varying demands. In many cases this brings along the need to reroute pathways etc., thus in order to meet the requirements of lighting standards a modification of the lighting system is usually unavoidable. For example a less frequently used pathway might become an emergency route, necessitating a number of luminaires to fulfill emergency lighting requirements. Other cases of adaptation are also conceivable, and the inventive enhance-

ment module is formed to aid these adaptations.

[0039] Figure 1 shows an oblong luminaire 10 as it might be installed in the aforementioned emergency pathway and furthermore an embodiment of an enhancement module 100 for functional enhancement of an oblong luminaire 10 according to the invention. As can be seen, the enhancement module 100 comprises a housing 110, formed to combine with the narrow end face of the oblong luminaire 10. Moreover, not visible in the embodiment of Figure 1 the enhancement module 100 according to the invention comprises controller means arranged to control operational functions of the oblong luminaire 10.

[0040] Following the example sketched above, the enhancement module 100 might be formed to enhance the functionality of an oblong luminaire 10 according to emergency lighting standards.

[0041] Providing a variety of benefits the enhancement module 100 is advantageously formed to complete the narrow end face of the housing 12 of the luminaire form fittingly. Figure 1 shows an oblong luminaire 10 comprising a readily removable end cap 18 at the narrow end. The housing 110 formed to replace the end cap 18 completing the narrow end face of the luminaire form fittingly and entirely. In this embodiment the housing 110 of the enhancement module is slid on housing member 12 of the oblong luminaire, with respective outer faces of the housing members forming a guiding rail.

[0042] Moreover, the oblong luminaire 10 depicted in Figure 1 comprises a likewise readily removable lamp holder 14, arranged to accommodate a tubular fluorescent lamp in this example. Fostering the combination of the enhancement module 100 with the oblong luminaire 10 the housing 110 comprises accommodation means 140 formed to combine with a lamp holder 14. As shown in more detail in the embodiment of Figure 2 the combination with the removable lamp holder 14 is favorable.

[0043] Further, following the embodiment of Figure 2 the accommodation means 140 might be formed as slots. The slots are provided in a bay, forming accommodation faces for the lamp holder 14, fostering a form-fitting combination of enhancement module 100 and lamp holder 14. Advantageously the slots are arranged to combine form fittingly with accommodation means comprised in the lamp holder 14. Lamp holder 14 comprises projections with an end face exceeding the dimensions of the slots, thus the projections can be slid into the slots form-fittingly, providing a frictional combination of lamp holder 14 and housing 110.

[0044] In the example the lamp holder 14 favorably comprises electrical connection means and a socket to combine with a lamp - in the depicted case a tubular fluorescent lamp. According to the invention the combination to a lamp holder 14 for any other type of lamp is not excluded. For example the usage of gas discharge lamps, LEDs - in particular LED arrays - or electric bulbs is conceivable. Preferably, the enhancement module 100 comprises corresponding connection means 145 to com-

bine with the connection means of the lamp holder 14. Advantageously the connection means 145 might also be formed to combine to electrical connection means or the wiring comprised in the oblong luminaire 10. However, the electrical connection of the enhancement module 100 might be routed separately from the electrical connection of the lamp holder 14.

[0045] Advantageously the enhancement module 100 comprises attachment means 120, formed to combine with the oblong luminaire. As shown in more detail in the preferred embodiment of Figure 3, the attachment means are arranged as an oblong extension plate.

[0046] Attachment means 120 might be arranged to slidably combine with a luminaire member. The embodiment of Figure 3 comprises an oblong extension plate, with respectively formed side faces, arranged to be slidably inserted into a housing member of the oblong luminaire 10, representing guiding means, form-fittingly enclosing the attachment means 120. Still following the embodiment of Figure 3, the attachment means 120 further comprise snap-fitting or latching means, in the depicted case a hook like protrusion member, formed to latch with respective openings arranged in the housing of the oblong luminaire 10.

[0047] In a preferred modification of the invention, the attachment means might be arranged to comprise electrical connection means. For example an expedient connector might be mounted or formed integrally to the oblong extension plate, completing electrical connection of oblong luminaire 10 and enhancement module 100, by latching the extension plate at an operating position.

[0048] In order to adapt to a variety of applications the enhancement module 100 according to the invention is provided with controller means. According to the invention, the enhancement module is arranged to control operational functions of the oblong luminaire 10, based on control signals generated and subsequently processed by the enhancement module.

[0049] According to the invention, the enhancement module 100 comprises sensor means 115. Preferably the sensor means 115 are arranged on an outer face of the enhancement module 100 or protrude the housing 110 of the enhancement module 100. More preferably a control signal provided by the sensor means 115 might be routed to the luminaire, favorably allowing the interaction of two or more enhancement modules. A suitable connector might be provided, preferably in the enhancement module 100. But also the oblong luminaire 10 might be arranged to support the routing of signals between two enhancement modules 100 or the enhancement module 100 and luminaire members. Embodiment of Figure 4 shows connection means 145, provided with three poles, wherein one pole carries a control signal of sensor means 115, other poles refer to power supply in this example.

[0050] According to the invention, the enhancement module 100 is formed to add functionality of an emergency luminaire to the oblong luminaire 10, it is advan-

tageous that the enhancement module 100 comprises sensor means 115 to detect the presence of persons. Preferably the respective sensor means 115 comprise an infrared receiver, advantageously formed to evaluate a differential signal, taken at different points in time or space. In an advanced embodiment a camera can be comprised.

[0051] Based on a control signal of the sensor means 115 the lighting of the oblong luminaire 10 can be controlled. This can be used to improve the duration of illumination by avoiding unnecessary constant lighting of the luminaire.

[0052] Further, a similar result can be gained by advantageously proposing sensor means 115 comprised in the enhancement module 100, arranged to detect the motion of objects in proximity of the enhancement module. In general identical sensor means 115 as for the detection of presence of persons are conceivable. A modified embodiment, might comprise a photoelectric barrier, a light beam or the like to support the detection of motion.

[0053] In an advanced embodiment, the enhancement module 100 comprises sensor means 115 arranged to detect and measure ambient brightness. In an example the respective sensor means 115 can be represented by a photodiode comprising a signal corresponding to the level of ambient illumination. Preferably the sensor means 115 are arranged at a position obviating the detection of light emitted by the oblong the luminaire 10. In an example, an expedient arrangement could be at an elevated position beyond the path of light emission of the luminaire. Further a differential analysis of at least two sensor elements might be beneficial. One could be comprised in the path of light emission of the oblong luminaire 10, whereas the second is preferably located beyond the path, more preferably in a recessed position.

[0054] Advantageously the enhancement module 100 is formed to avoid the lighting of the oblong luminaire 10, when ambient brightness exceeds a threshold level. The threshold level can be predefined, however, the enhancement module 100 advantageously comprises control elements, preferably a knurled wheel, to adjust the respective threshold level.

[0055] It is conceivable that the enhancement module 100 is formed to receive a sensor signal or a control signal corresponding to the sensor signal, preferably in a wireless manner.

[0056] According to the invention, the enhancement module is formed to detect the loss of power supply for the oblong luminaire. For example a circuit is conceivable monitoring the voltage of a correspondingly charged capacitor, and in an advanced embodiment an inductive coupling of a detection circuit is stipulated.

[0057] According to the invention, the enhancement module 100 is formed to connect the oblong luminaire 10 to an emergency power supply. Advantageously based on the signal of sensor means 115, arranged to detect the loss of power supply for the oblong luminaire

10, the enhancement module 100 is formed to change the source of power supply. The respective emergency power supply can be arranged both integral to the enhancement module 100 or the oblong luminaire 10, and separate to the enhancement module 100.

[0058] An integral emergency power supply is preferably represented by a battery or accumulator arrangement, preferably chargeable by the power supply of the oblong luminaire 10. Preferably a respective two pole connector is provided in both the luminaire and the enhancement module.

[0059] Further in an advantageous embodiment, the enhancement module 100 can be arranged to monitor the current provided for respective light sources, thus raising the possibility to conclude on functionality of the light sources or their respective aging processes. Preferably the enhancement module is formed to signal or indicate light sources, not meeting a predefined current consumption interval. Preferably the enhancement module 100 is arranged to adapt the signaling and especially the respective current interval of proper operation to various light sources, possibly also individually for a plurality of light sources.

[0060] In a preferred embodiment the enhancement module 100 is formed to dim the intensity of light emitted by the oblong luminaire 10. Following the sketched example of an enhancement for an emergency luminaire, the enhancement module is preferably formed to operate the light source of the oblong luminaire with reduced power consumption when compared to normal operation, thus enhancing the duration of emergency illumination.

[0061] However, it is also conceivable to provide dimming functionality for general illumination purposes, to adapt to various needs.

[0062] Moreover, in an example, the enhancement module 100 might be formed to alter the number of light sources used for illumination.

[0063] Preferably the enhancement module 100 comprises additional light sources, favorably contributing to the light emission of the oblong luminaire 10. Preferably the opportunity is raised to highlight obstacles or projecting spots. Advantageously the additional light sources are formed as LED light sources, preferably supporting the usage as an emergency luminaire.

[0064] In a preferred embodiment the enhancement module 100 comprises a microprocessor arranged to control functionality of the oblong luminaire 10. Advantageously the microprocessor is formed to initiate and control a sequence of lighting functions of the oblong luminaire 10 according to a predefined sequence, defined by a set of instructions or data processible by the microprocessor.

[0065] As an example, the predefined sequence might comprise a dimming sequence mimicing the course of natural light.

[0066] Furthermore, it is also conceivable that the predefined sequence controls switching events, to illuminate the oblong luminaire 10 for a certain period or at certain

points in time, including blinking or flickering effects, advantageously used for signaling purposes.

[0067] Moreover, the predefined sequence might include the monitoring of battery voltage, and comprise the signaling of insufficient battery power, of an emergency power supply for example.

[0068] In a preferred modification of the invention, the enhancement module 100 is formed to receive commands for exhibiting specific lighting functions. Preferably the enhancement module 100 comprises a receiver for wireless signals. For example a remote controlled dimming or controlling other functionality remotely might be realized. As an example the receiver might be formed to communicate via a radio signal.

[0069] Preferably the functionality of an oblong luminaire, wherein the enhancement module 100 comprises a housing 110, formed to combine with the oblong luminaire 10, and further controller means arranged to control operational functions of the oblong luminaire 10 is enhanced by combining an enhancement module 100 electrically with the oblong luminaire 10, and further to combining the enhancement module 100 with a narrow end face of the oblong luminaire 10.

[0070] Advantageously a lamp holder 14 can be combined with the enhancement module 100, preferably before combining the enhancement module 100 with the oblong luminaire 10.

[0071] Further, in a modification the lamp holder 14 is previously combined to the oblong luminaire 10. Therefore, a step to enhance the functionality of an oblong luminaire comprises removing the lamp holder 14 from the oblong luminaire 10 and combining it with the enhancement module 100.

[0072] Advantageously the mounting of the enhancement module 100 can be arranged while the oblong luminaire 10 remains installed.

[0073] Preferably this might be aided by a luminaire comprising a readily removable end cap 18. Figure 1 shows an end cap 18 snapped or slid on a U-shaped housing member 12 comprised in the oblong luminaire 10. Removing this end cap creates an aperture, providing access to both electrical and mechanical connection means comprised in the oblong luminaire 10. Mechanical connection means are realized by the U-shaped housing member 12, as an example. Electrical connection means can comprise connectors formed to restrict the electrical connection to a defined polarity. Preferably the enhancement module 100 comprises expedient connection means 145, arranged with a likewise restriction.

[0074] A modified method preferably comprises therefore removing an end cap 18 from oblong luminaire 10 and combining the enhancement module 100 electrically with the oblong luminaire 10 - advantageously plugging said connection means 145 together.

[0075] Further a preferred embodiment presented in Figure 1 depicts an enhancement module 100 comprising attachment means 120 formed as an oblong extension plate. This extension plate is formed to be inserted

or tugged into guiding means, comprised in the U-shaped housing member 12, providing a stable connection, favorably extending the contact area between oblong luminaire 10 and enhancement module 100. Moreover the oblong extension plate is formed to lock snap-fittingly with the oblong luminaire 10. The extension plate is advantageously provided with projections, formed to protrude openings comprised in the guiding means, latching at predefined positions.

[0076] Therefore, a modified method comprises combining the enhancement module 100 mechanically with a narrow end face of the oblong luminaire 10 and completing the margin provided by the removal of the end cap 18 form fittingly. Furthermore it is to add, that in all methods according to the invention the steps combining the enhancement module 100 electrically with the oblong luminaire 10 and combining the enhancement module 100 with a narrow end face of the oblong luminaire 10 can be executed simultaneously, provided that expedient attachment means 120 are arranged. In this case the electrical connection means 145 and attachment means 120 are favorably formed integrally.

[0077] Aided by the inventive enhancement module 100 operational functions of an oblong luminaire can be adapted and enhanced swiftly, providing a significant improvement in adapting to various applications, predominantly obviating sophisticated modifications of the oblong luminaire 10 or the respective electrical wiring.

Claims

1. Luminaire arrangement with an oblong luminaire (10) and an enhancement module (100) for functional enhancement (100) of the oblong luminaire (10), wherein the enhancement module (100) is removable and arranged at a narrow end face of the oblong luminaire (10) and comprises

- a housing (110), formed to combine form-fittingly with the narrow end face of the oblong luminaire (10), and further
- controller means arranged to control operational functions of the oblong luminaire (10), and
- sensors means (115) arranged to generate a control signal,

wherein the enhancement module (100) is arranged to control operational functions of the oblong luminaire (10) based on control signals, generated by the sensor means (115), and subsequently processed by the enhancement module (100),

characterized in that

the enhancement module (100) is formed to detect the loss of power supply for the oblong luminaire (10), and the controller means are arranged to connect the oblong luminaire (10) to an emergency power supply subsequently to the

loss of power supply.

2. Luminaire arrangement according to claim 1,
characterized in that,
the emergency power supply is integral to the enhancement module (100), preferably arranged as a battery or accumulator. 5
3. Luminaire arrangement according to any preceding claim,
characterized in that,
the housing (110) comprises accommodation means (140), formed to combine with a lamp holder (14), in particular a lamp holder comprised in the oblong luminaire (10). 10
4. Luminaire arrangement according to claim 3,
characterized in that,
the accommodation means (140) are formed as slots, for accommodating form-fittingly the lamp holder (14). 20
5. Luminaire arrangement according to any preceding claim,
characterized in that,
the enhancement module (100) comprises attachment means (120) to combine with the oblong luminaire (10), and in particular attachment means (120) comprising snap-fitting or latching means (125). 25
6. Luminaire arrangement according to any preceding claim,
characterized in that,
the enhancement module (100) comprises sensors means (115) to detect the presence of persons and / or motion of objects in the proximity of the enhancement module (100), and in particular the controller means are arranged to initiate the lighting of the oblong luminaire (10), when presence or motion is detected. 30
7. Luminaire arrangement according to any preceding claim,
characterized in that,
the enhancement module (100) comprises sensor means (115) to detect the ambient brightness, and in particular the controller means are arranged to avoid the lighting of the oblong luminaire (10) when ambient brightness exceeds a threshold level. 35
8. Luminaire arrangement according to any preceding claim,
characterized in that,
the enhancement module (100) is formed to dim the intensity of light emitted by the oblong luminaire (10). 40
9. Luminaire arrangement according to any preceding claim, 45

characterized in that,

the enhancement module (100) comprises connection means (145), arranged to electrically combine with a lamp holder (14), in particular restricting electrical connection with the lamp holder (14) to a defined polarity.

10. Method for enhancing the operational functionality of an oblong luminaire (10), wherein the oblong luminaire (10) is part of a luminaire arrangement and the luminaire arrangement comprises the oblong luminaire (10) and an enhancement module (100), the method comprises the steps 50

- a) combining the enhancement module (100) electrically with the oblong luminaire (10),
- b) combining the enhancement module (100) with a narrow end face of the oblong luminaire (10),

wherein the enhancement module (100) is removable and comprises

- a housing (110), formed to combine form-fittingly with the narrow end face of the oblong luminaire (10), and further
 - controller means arranged to control operational functions of the oblong luminaire (10), and
 - sensors means (115) arranged to generate a control signal,
- wherein the enhancement module (100) is arranged to control operational functions of the oblong luminaire (10) based on control signals, generated by the sensor means (115), and subsequently processed by the enhancement module (100),

characterized in that

the enhancement module (100) is formed to detect the loss of power supply for the oblong luminaire (10), and the controller means are arranged to connect the oblong luminaire (10) to an emergency power supply subsequently to the loss of power supply.

11. Method according to claim 10,
characterized in that,
the enhancement module (100) is combined to the oblong luminaire (10), while the oblong luminaire (10) remains installed. 50

Patentansprüche

1. Beleuchtungsanordnung mit einer länglichen Leuchte (10) und einem Erweiterungsmodul (100) zur Funktionserweiterung (100) der länglichen Leuchte (10), wobei das Erweiterungsmodul (100) abnehmbar und an einer schmalen Stirnseite der länglichen

Leuchte (10) angeordnet ist und umfasst:

- ein Gehäuse (110), das zur formschlüssigen Verbindung mit der schmalen Stirnseite der länglichen Leuchte (10) ausgebildet ist, und ferner
- Steuermittel, die zur Steuerung von Betriebsfunktionen der länglichen Leuchte (10) angeordnet sind, und
- Sensormittel (115), die zur Erzeugung eines Steuersignals angeordnet sind, wobei das Erweiterungsmodul (100) zur Steuerung von Betriebsfunktionen der länglichen Leuchte (10) basierend auf Steuersignalen angeordnet ist, die von den Sensormitteln (115) erzeugt und anschließend von dem Erweiterungsmodul (100) verarbeitet werden,

dadurch gekennzeichnet, dass

das Erweiterungsmodul (100) zur Erkennung des Verlusts der Stromversorgung für die längliche Leuchte (10) ausgebildet ist, und die Steuermittel zur Verbindung der länglichen Leuchte (10) mit einer Notstromversorgung im Anschluss an den Verlust der Stromversorgung angeordnet sind.

2. Beleuchtungsanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Notstromversorgung in das Erweiterungsmodul (100) integriert ist, vorzugsweise als Batterie oder Akkumulator angeordnet ist.
3. Beleuchtungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gehäuse (110) Aufnahmemittel (140) umfasst, die zur Kombination mit einer Lampenfassung (14), insbesondere einer in der länglichen Leuchte (10) enthaltenen Lampenfassung, ausgebildet sind.
4. Beleuchtungsanordnung nach Anspruch 3, **dadurch gekennzeichnet, dass** die Aufnahmemittel (140) als Schlitze zur formschlüssigen Aufnahme der Lampenfassung (14) ausgebildet sind.
5. Beleuchtungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Erweiterungsmodul (100) Befestigungsmittel (120) zum Kombinieren mit der länglichen Leuchte (10) umfasst, und insbesondere Befestigungsmittel (120), die Schnapp- oder Einrastmittel (125) umfassen.
6. Beleuchtungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass**

das Erweiterungsmodul (100) Sensormittel (115) zur Erfassung der Anwesenheit von Personen und/oder der Bewegung von Gegenständen in der Nähe des Erweiterungsmoduls (100) umfasst, und insbesondere die Steuermittel so angeordnet sind, dass sie die Beleuchtung der länglichen Leuchte (10) einleiten, wenn Anwesenheit oder Bewegung erfasst wird.

7. Beleuchtungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Erweiterungsmodul (100) Sensormittel (115) zur Erfassung der Umgebungshelligkeit umfasst, und insbesondere die Steuermittel zur Vermeidung der Beleuchtung der länglichen Leuchte (10) angeordnet sind, wenn die Umgebungshelligkeit einen Schwellenwert überschreitet.

8. Beleuchtungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Erweiterungsmodul (100) zur Dämpfung der Intensität des von der länglichen Leuchte (10) emittierten Lichts ausgebildet ist.

9. Beleuchtungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Erweiterungsmodul (100) Befestigungsmittel (145) umfasst, die zur elektrischen Verbindung mit einer Lampenfassung (14) ausgebildet sind, insbesondere zur Beschränkung der elektrischen Verbindung mit der Lampenfassung (14) auf eine definierte Polarität.

10. Verfahren zur Verbesserung der Betriebsfunktionalität einer länglichen Leuchte (10), wobei die längliche Leuchte (10) Teil einer Beleuchtungsanordnung ist und die Beleuchtungsanordnung die längliche Leuchte (10) und ein Erweiterungsmodul (100) umfasst, wobei das Verfahren die folgenden Schritte umfasst:

- a) Elektrisches Kombinieren des Erweiterungsmoduls (100) mit der länglichen Leuchte (10),
- b) Kombinieren des Erweiterungsmoduls (100) mit einer schmalen Stirnfläche der länglichen Leuchte (10),

wobei das Erweiterungsmodul (100) abnehmbar ist und umfasst

- ein Gehäuse (110), das zur formschlüssigen Verbindung mit der schmalen Stirnseite der länglichen Leuchte (10) ausgebildet ist, und ferner
- Steuermittel, die zur Steuerung von Betriebsfunktionen der länglichen Leuchte (10) angeordnet

net sind, und

- Sensormittel (115), die zur Erzeugung eines Steuersignals angeordnet sind, wobei das Erweiterungsmodul (100) zur Steuerung von Betriebsfunktionen der länglichen Leuchte (10) basierend auf Steuersignalen angeordnet ist, die von den Sensormitteln (115) erzeugt und anschließend von dem Erweiterungsmodul (100) verarbeitet werden,

dadurch gekennzeichnet, dass

das Erweiterungsmodul (100) zur Erkennung des Verlusts der Stromversorgung für die längliche Leuchte (10) ausgebildet ist, und die Steuermittel zur Verbindung der länglichen Leuchte (10) mit einer Notstromversorgung im Anschluss an den Verlust der Stromversorgung angeordnet sind.

11. Verfahren nach Anspruch 10,

dadurch gekennzeichnet, dass

das Erweiterungsmodul (100) mit der länglichen Leuchte (10) kombiniert wird, während die längliche Leuchte (10) installiert bleibt.

Revendications

1. Dispositif d'éclairage comprenant un luminaire oblong (10) et un module d'amélioration (100) permettant d'améliorer le fonctionnement (100) du luminaire oblong (10), le module d'amélioration (100) étant amovible et disposé sur une face terminale étroite du luminaire oblong (10) et comprenant

- un boîtier (110) conçu pour se combiner par complémentarité de forme avec la face terminale étroite du luminaire oblong (10), ainsi que
- des moyens de commande agencés pour commander les fonctions opérationnelles du luminaire oblong (10), et
- des moyens de détection (115) agencés pour générer un signal de commande, ledit module d'amélioration (100) étant agencé pour commander des fonctions opérationnelles du luminaire oblong (10) en fonction de signaux de commande générés par les moyens de détection (115) et traités subséquentment par le module d'amélioration (100),

caractérisé en ce que

le module d'amélioration (100) est conçu pour détecter la perte d'alimentation destinée au luminaire oblong (10), et les moyens de commande sont agencés pour connecter le luminaire oblong (10) à une alimentation électrique de secours subséquentment à la perte d'alimentation électrique.

2. Dispositif d'éclairage selon la revendication 1,

caractérisé en ce que

l'alimentation électrique de secours est intégrée au module d'amélioration (100), de préférence agencée sous la forme d'une batterie ou d'un accumulateur.

3. Dispositif d'éclairage selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le boîtier (110) comprend des moyens de logement (140) formés pour se combiner avec un support de lampe (14), notamment un support de lampe compris dans le luminaire oblong (10).

4. Dispositif d'éclairage selon la revendication 3,

caractérisé en ce que

les moyens de logement (140) prennent la forme de fentes permettant de loger le support de lampe (14) par complémentarité de forme.

5. Dispositif d'éclairage selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le module d'amélioration (100) comprend un moyen de fixation (120) à combiner avec le luminaire oblong (10), et notamment un moyen de fixation (120) comprenant un moyen d'encliquetage ou de verrouillage (125).

6. Dispositif d'éclairage selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le module d'amélioration (100) comprend des moyens de détection (115) permettant de détecter la présence de personnes et/ou le mouvement d'objets à proximité du module d'amélioration (100), et les moyens de commande sont notamment agencés pour activer le luminaire oblong (10) lorsqu'une présence ou un mouvement est détecté.

7. Dispositif d'éclairage selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le module d'amélioration (100) comprend un moyen de détection (115) permettant de détecter la luminosité ambiante, et les moyens de commande sont notamment agencés pour éviter l'activation du luminaire oblong (10) lorsque la luminosité ambiante dépasse un niveau seuil.

8. Dispositif d'éclairage selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le module d'amélioration (100) est conçu pour atténuer l'intensité de la lumière émise par le luminaire oblong (10).

9. Dispositif d'éclairage selon l'une quelconque des revendications précédentes,

caractérisé en ce que

le module d'amélioration (100) comprend des moyens de connexion (145), agencés pour se combiner électriquement avec un support de lampe (14), limitant notamment la connexion électrique avec le support de lampe (14) à une polarité définie. 5

10. Procédé d'amélioration de la fonctionnalité opérationnelle d'un

luminaire oblong (10), le luminaire oblong (10) faisant partie d'un dispositif d'éclairage et le dispositif d'éclairage comprenant le luminaire oblong (10) et un module d'amélioration (100), le procédé comprenant les étapes consistant à 10

- 15
- a) combiner le module d'amélioration (100) électriquement avec le luminaire oblong (10),
 - b) combiner le module d'amélioration (100) avec une face terminale étroite du luminaire oblong (10), ledit module d'amélioration (100) étant amovible et comprenant 20
 - un boîtier (110) conçu pour se combiner par complémentarité de forme avec la face terminale étroite du luminaire oblong (10), ainsi que
 - des moyens de commande agencés pour commander les fonctions opérationnelles du luminaire oblong (10), et 25
 - des moyens de détection (115) agencés pour générer un signal de commande, ledit module d'amélioration (100) étant agencé pour commander des fonctions opérationnelles du luminaire oblong (10) en fonction de signaux de commande générés par les moyens de détection (115) et traités subséquentment par le module d'amélioration (100), 30 35

caractérisé en ce que

le module d'amélioration (100) est conçu pour détecter la perte d'alimentation destinée au luminaire oblong (10), et les moyens de commande sont agencés pour connecter le luminaire oblong (10) à une alimentation électrique de secours subséquentment à la perte d'alimentation électrique. 40

11. Procédé selon la revendication 10, 45

caractérisé en ce que

le module d'amélioration (100) est combiné au luminaire oblong (10) tandis que le luminaire oblong (10) demeure installé. 50

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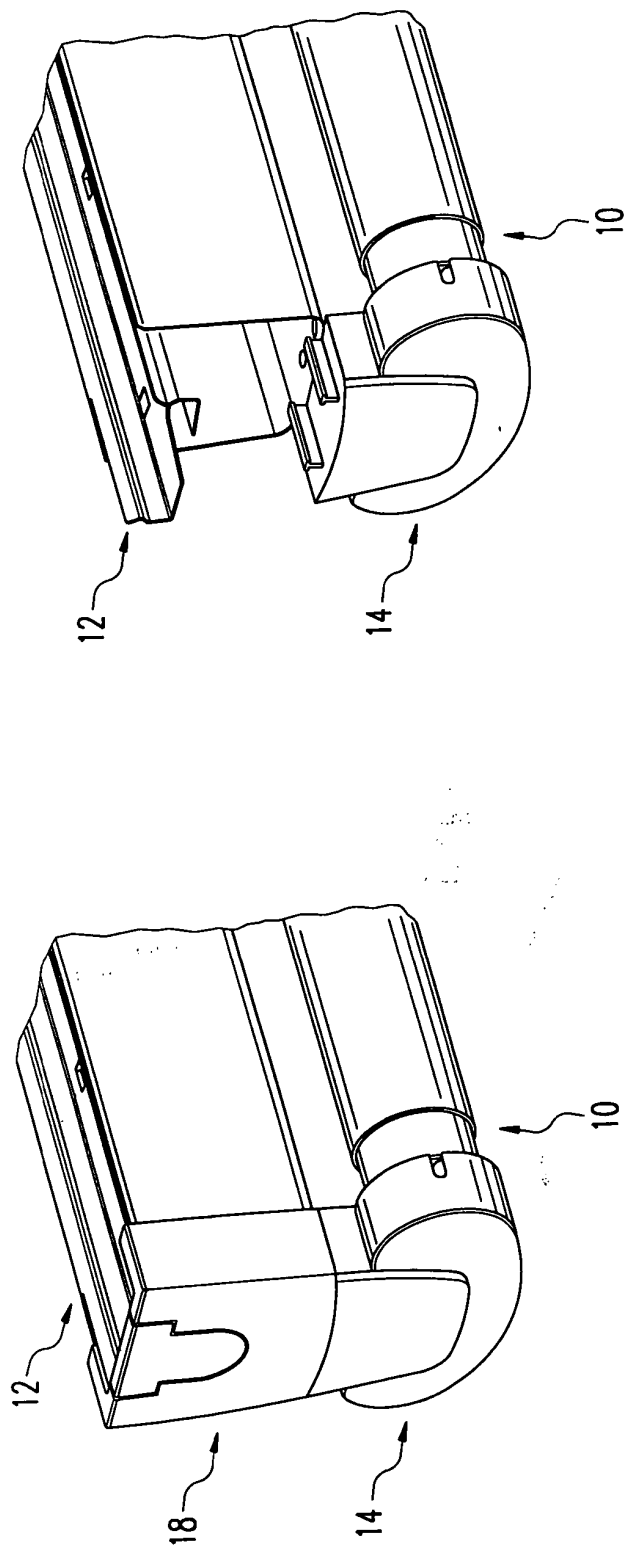
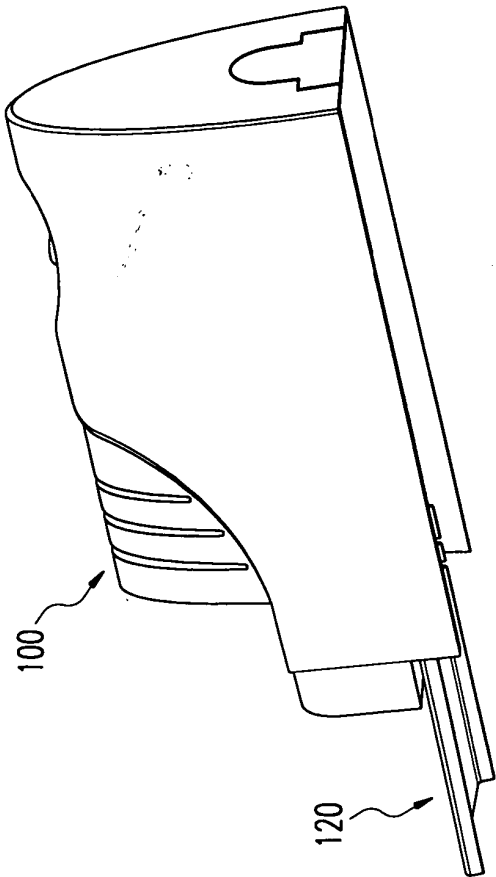


Fig. 1



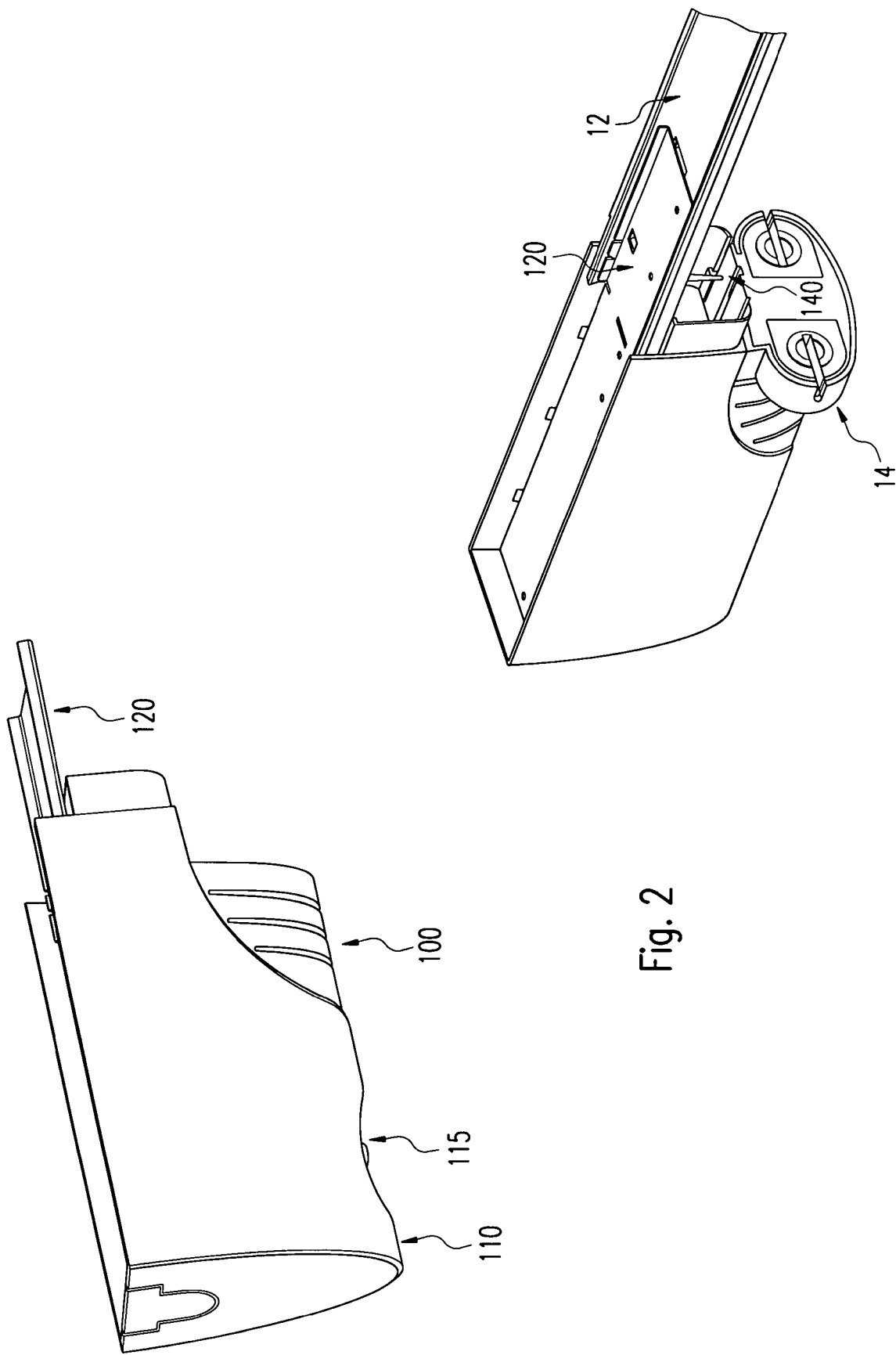
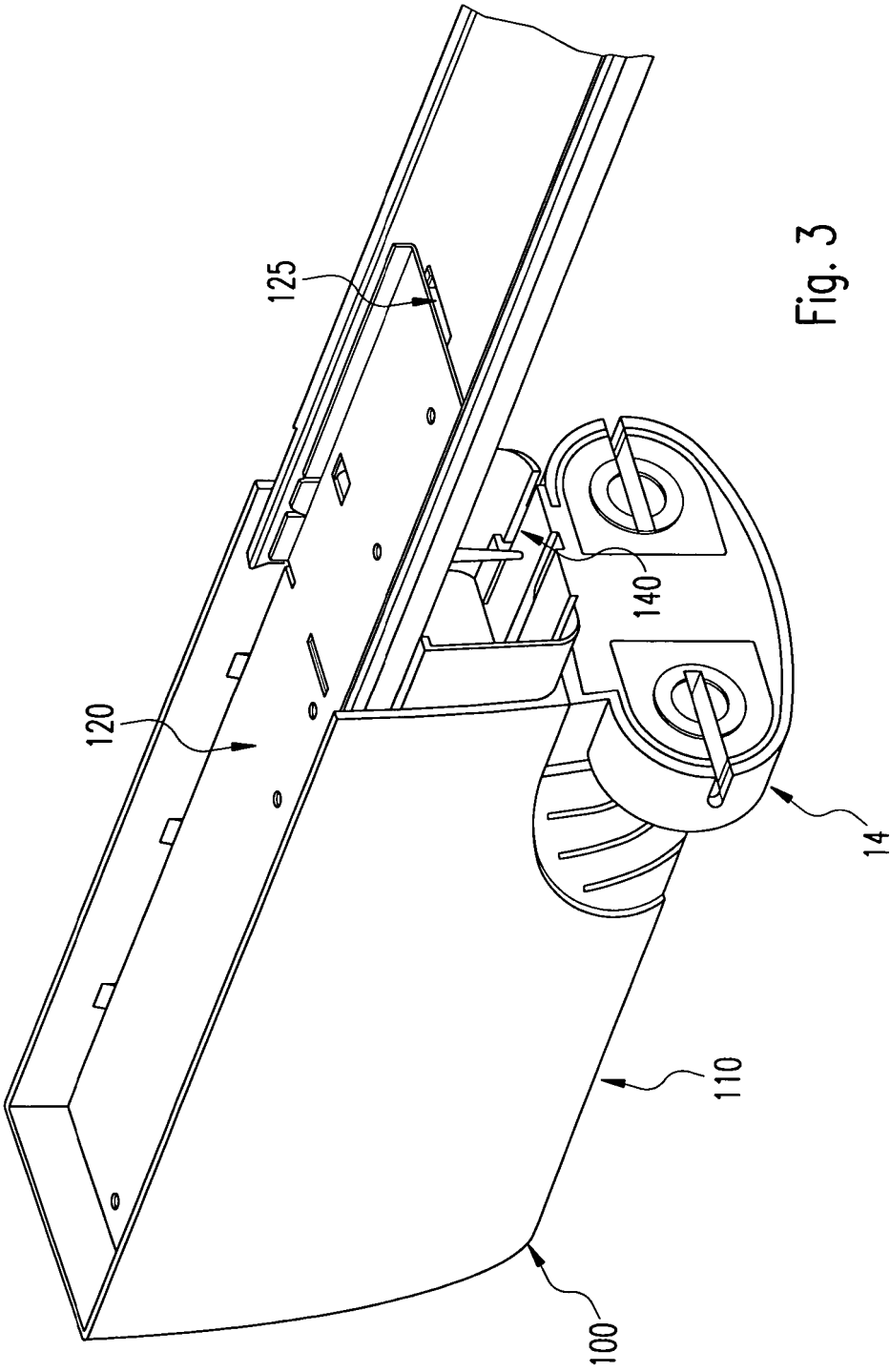


Fig. 2



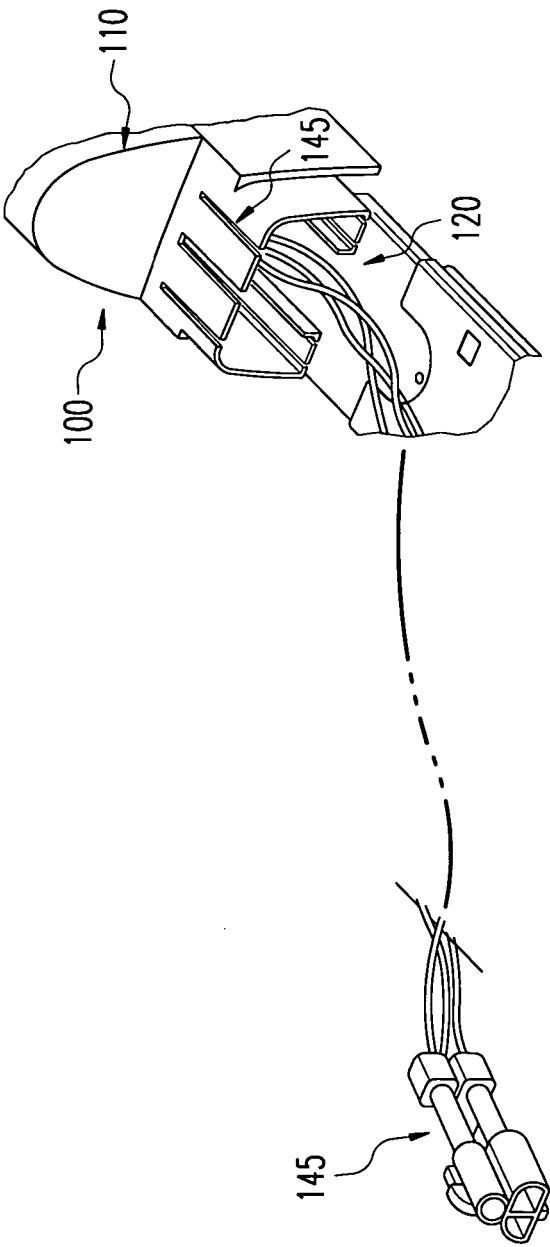


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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