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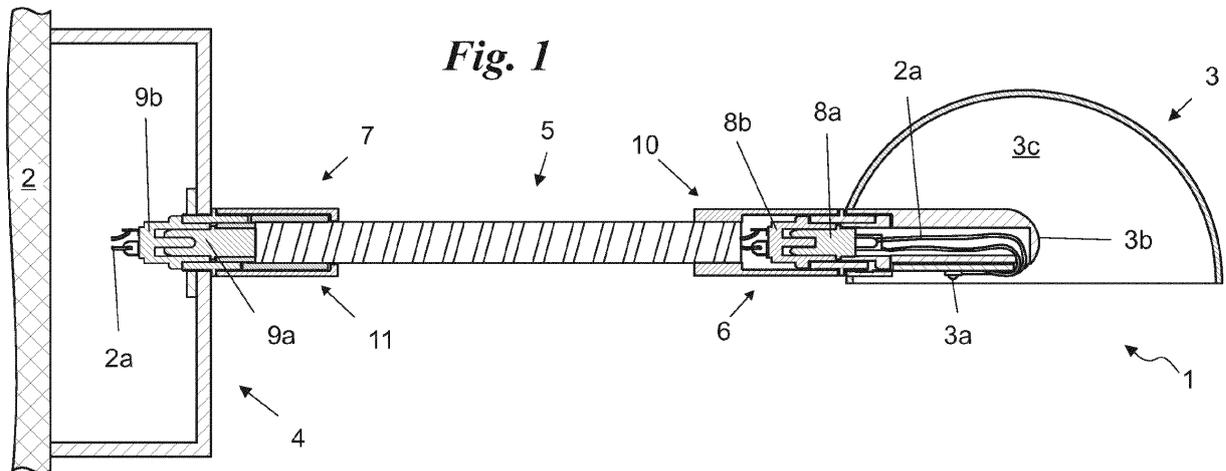
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(54) **A lighting device, in particular a LED lighting device**

(57) A lighting device, in particular a LED lighting device (1) adapted to be disposed on a supporting structure (2), comprising at least one lighting assembly (3) including light-emitting means (3a); a stand provided with electric connections (2a) terminating at the lighting assembly (3) and adapted to support the lighting assembly (3) en-

abling positioning of the device (1) on a supporting structure (2), and first releasable connecting means (6) adapted to mechanically secure the lighting assembly (3) to the stand and including a first pair of plug connectors suitable to carry out a current-passage connection between the lighting assembly (3) and the stand.



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## Description

**[0001]** The present invention relates to a lighting device, in particular a LED lighting device of the type pointed out in the preamble of the first claim.

**[0002]** More specifically, the lighting device consists of a lamp provided with a LED. It is known that lighting devices are used for lighting at least one portion of an environment and are such constructed as to also constitute an ornament for the environment itself, i.e. each device is characterised by a particular shape and colour enabling it to suit the aesthetics of the environment or room in which it is placed.

**[0003]** They usually consist of the following main components: a lighting assembly adapted to emit light and usually placed at an end of the device, and a pedestal or stand enabling placement of the lighting assembly on a supporting structure, such as a wall, floor or piece of furniture. The stand usually comprises a base and a central body connecting the base to the lighting assembly and defining most of the device shape.

**[0004]** The lighting assembly has a light-emitting means, such as a LED, and in some cases a covering adapted to orient the light produced by the emitting means, which covering too determines the device aesthetics.

**[0005]** In particular, in a lighting device equipped with LEDs, a base is provided to which a plurality of central bodies are fastened each of which has a LED which is secured to an end thereof in an unreleasable manner. Each LED is usually equipped with a connecting wire which is welded to the LED itself and enables the LED to be electrically connected to the electric system belonging to the room or the environment. In greater detail, this wire runs inside the central body and connects the LED to the base.

**[0006]** The known art mentioned above has some important drawbacks.

**[0007]** In fact, on the one hand, in the traditional lighting devices the light-emitting means alone can be changed, i.e. the bulb, and, on the other hand, in case of LED devices this replacement too is impossible.

**[0008]** Therefore, in lighting devices and in particular in LED lighting devices, maintenance operations are difficult and even impracticable. Often, due to the failure of one component the whole device has to be replaced.

**[0009]** For instance, if in a device provided with a plurality of LEDs one of said LEDs breaks, replacement of the whole device may be required.

**[0010]** Another problem is represented by the structure inelasticity, i.e. the devices do not suit the aesthetics of the environment. In fact, said devices have a substantially unmodifiable design and it is difficult to make them fit the environment in which they are placed.

**[0011]** Practically, the devices are not able to adjust themselves to possible aesthetic variations of the environment where they are. For instance, if the furniture is modified in an environment or room, the device that was

all right for the first arrangement, is now out of place and therefore can give rise to a low quality aesthetic effect of the assembly.

**[0012]** In addition, in some cases, the lighting devices do not represent the optimal choice from an aesthetic point of view but only are a compromise between the necessity to conveniently illuminate the room and that of having an object adapted to the environment style and to the other objects therein present.

**[0013]** Under this situation, the technical task underlying the present invention is to conceive a lighting device, in particular a LED lighting device that is able to substantially obviate the mentioned drawbacks.

**[0014]** Within the scope of this technical task, it is an important aim of the invention to make available a device on which maintenance operations can be easily carried out.

**[0015]** Another aim of the invention is to provide a device that can be easily adapted to the aesthetics of the environment where it is placed. In particular, the device must be able to also adapt itself to possible changes in the initial furnishings.

**[0016]** It is a further aim of the invention to conceive a lighting device that is simple and cheap.

**[0017]** The technical task mentioned and the aims specified are achieved by a lighting device, in particular a LED lighting device as claimed in the appended claim 1. Preferred embodiments are highlighted in the sub-claims.

**[0018]** The features and advantages of the invention are hereinafter clarified by the detailed description of preferred embodiments of the invention, with reference to the accompanying drawings, in which:

**Fig. 1** shows a section of a lighting device according to the invention;

**Fig. 2** is an exploded section view of the device with two possible final components;

**Fig. 3** shows a further embodiment of the device according to the invention;

**Fig. 4** is a perspective view of a portion of Fig. 2;

**Fig. 5** shows a first detail of the lighting device; and

**Fig. 6** represents a second detail of the device of the invention.

**[0019]** With reference to the drawings, the lighting device according to the invention is generally identified by reference numeral 1.

**[0020]** It is employed for lighting at least one portion of an environment such as a room or a room area. Device 1 is placed on a supporting structure 2 such as a wall, floor or piece of furniture. In particular, it is rigidly secured to the supporting structure 2 or, alternatively, rests thereon, so as to enable easy movement of the device itself. The lighting device 1 preferably consists of a lamp that is usually disposed on a shelf, such as a desk. Another type of lighting devices 1 is represented by light fixtures or chandeliers hanging from a ceiling or applied to an

appropriate height so as to illuminate the surrounding environment from above. Finally, device 1 can be a wall lamp, i.e. a lamp applied to the wall, or a standard lamp. As shown in Fig. 1, it comprises at least one lighting assembly 3 adapted to emit light for illuminating at least part of the environment, and a stand defining the major portion of device 1. In particular, the stand has a base 4 adapted to enable placement of device 1 on said supporting structure 2 and, generally, at least one central body 5 for connecting the lighting assembly 3 to the base 4.

**[0021]** Device 1 preferably is of the electric type and is provided with electric connections 2a such as cables or other similar elements, adapted to bring the lighting assembly 3 into connection for current passage through the central body 5 and base 4, with a wiring system belonging to the supporting structure 2 on which the lighting device 1 is placed.

**[0022]** The assembly 3, as shown in Fig. 3, comprises light-emitting means 3a adapted to produce the light illuminating the environment and a support 3b adapted to carry the means 3a enabling mechanical and electric fastening of said means to the central body 5. In particular, the light-emitting means 3a preferably includes at least one Light-Emitting Diode, commonly referred to as LED, and support 3b has a dissipator enabling the heat produced by the LED to be dissipated so as to ensure good operation and high duration to said LED.

**[0023]** Finally, the lighting assembly 3 can advantageously comprise a dome-shaped covering or diffuser or lamp-cover 3c (Fig. 3) adapted to at least partly surround the light-emitting means 3a and, preferably, the support 2b. The dome-shaped covering 3c allows the produced light to be focused on a particular environment portion or, alternatively, can be adapted to give the light a particular colour or optical effect.

**[0024]** The base 4 that together with the central body 3c defines said stand is adapted to ensure support of device 1 in the desired position and usually has a cylindrical shape. It can be provided with fastening equipment, not shown in the figures, enabling the lighting device 1 to be rigidly secured to structure 2.

**[0025]** The central body 5 allows the base 4 to be connected to the lighting assembly 3. In particular, the body 5 is deformable, preferably in a plastic manner, so that the position of the assembly 3 can be varied relative to the base 4.

**[0026]** In addition, the base 4 and body 5 have an inner cavity for the internal passage of said electric cables 2a so that the electric current can reach the light-emitting means 3a.

**[0027]** Advantageously, the lighting device 1 comprises first releasable connecting means 6 for releasably connecting at least one of the lighting assemblies 3 to the stand. In particular, means 6 preferably connects a lighting assembly 3 to one of the central bodies 5.

**[0028]** Advantageously, device 1 can be in addition provided with second releasable connecting means 7

adapted to releasably connect the base 4 to the central bodies 5.

**[0029]** Both the first and the second releasable connecting means are adapted to bring the mutually connected respective components into connection for current passage. To this aim, means 6 and 7 respectively include a first pair of plug connectors and a second pair of plug connectors.

**[0030]** Said pairs of plug connectors are mechanical connectors and each of them has, in known manner, two elements: a male connector, 8a and 9a, consisting of at least one plug and a female connector 8b and 9b, consisting of at least one hub. Coupling between the aforesaid two elements is carried out by forcibly fitting the plugs of a male connector into the hubs of the female connectors.

**[0031]** In particular, the pairs of connectors are unipolar connectors, i.e. the female connectors 8b and 9b have a single hub and the male connectors 8a and 9a have a single plug. These male connectors 8a and 9a are commonly known as "jacks". The first pair of plug connectors and second pair of plug connectors are advantageously identical, i.e. they have the same type of jack and the central body at both ends has one male connector and one female connector. In particular it has the first female connector 8b and the second male connector 9a as shown, as shown in Fig. 2.

**[0032]** The male connectors 8a and 9a and female connectors 8b and 9b are fastened in known manner to the respective components constituting the lighting device 1 through suitable constraining equipment such as screws, bolts, friction fits and welding.

**[0033]** Finally, both the first and second connecting means 6 and 7 contemplate the presence of a constraining system adapted to stabilise the connection between the components. In detail, the constraining system makes the two components integral with each other preventing disengagement of the connectors and therefore a break in the current-passage connection.

**[0034]** Practically, the first connecting means 6 have a constraining system consisting of a connection assembly 10 shown in Fig. 5 comprising a cylindrical element 10a provided with a male thread integral with one of the two connected components. Preferably, element 10a is fastened to the central body 5 in the vicinity of the female connector 8b. In particular, the cylindrical element 10a is adapted to at least partly surround connector 8b as shown in Figs. 1 and 2. In addition, a female thread is provided on support 3b, which thread is suitable to match the thread present on element 10a during connection between body 5 and the lighting assembly 3.

**[0035]** In addition, the connection assembly 10 can advantageously comprise a cap 10b and a closing component 10c (Figs. 3, 5).

**[0036]** Cap 10b is adapted to cover the junction region between body 5 and the related connector inhibiting entry of external agents that could damage device 1. In addition, cap 10b engages part of the thread of the connection

element 10a securing the connector to the central body 5. The closing component 10c, disposed at connector 8a belonging to the lighting assembly 3 is provided with suitable threads enabling component 10c to lock connector 8a to the assembly 3 and fasten said assembly to the central body 5. In particular it has a female thread suitable for engagement with the cylindrical element 10a.

**[0037]** The second connecting means 7 comprises an alternative constraining system consisting of a threaded connection member 11 shown in Fig. 6.

**[0038]** The member 11 comprises two threaded units 11a, each of which is provided with a male thread and is rigidly fastened to one of the components to be connected, and a connection block 11b provided with a female thread and suitable for engagement with the two units 11a, further securing the two components connected by the releasable connecting means 7.

**[0039]** As shown in Fig. 1, the threaded units 11a are positioned in the vicinity of the individual connectors and therefore the base 4 and lighting assembly 3 have a single unit 11a, while the central body 5 is provided with two units 11a. In greater detail, units 11a are such disposed that, when coupling between the male connector 9a and female connector 9b is carried out, units 11a are substantially in contact.

**[0040]** The connection block 11b has a cylindrical hollow shape provided with a portion with a female thread long enough to simultaneously engage the female threads of the two units 11a belonging to the second releasable connecting means 7. In detail, said threaded portion of block 11b has such a length that when locking of the two components is carried out, it simultaneously engages the threads of the two units 11a.

**[0041]** As shown in Fig. 4, in order to avoid a relative rotation motion between two connected components, elements 11a in the vicinity of the part adapted to appear during locking, have a projecting portion 11c preferably of semicircular shape and provided with a male thread. These portions 11c are adapted to mutually match inhibiting relative motions between the two locked components. In particular, matching between the two portions 11c defines almost the whole profile of a thread suitable for engagement with block 11b during the constraining of said two components.

**[0042]** The threads of the components included in the connection assembly 10 and of the parts constituting the connection member 11 are almost coincident, therefore enabling the female thread of the closing component 10c to advantageously engage with the male thread present on the threaded unit 11a belonging to the base 4. In conclusion, it is possible to connect the lighting assembly 3 directly to the base itself, as shown in Fig. 3.

**[0043]** Finally, the constraining systems provided in the first and second releasable connecting means 6 and 7 can be of the same type. In particular, means 6 and 7 can be both provided with a connection assembly 10 or, alternatively, a connection member 11.

**[0044]** Operation of the lighting device described

above as regards structure is the following.

**[0045]** When device 1 is being assembled, first the base 4 is placed on the supporting structure 2 and, if necessary, the base 4 is made integral with structure 2 through suitable instruments.

**[0046]** Subsequently, the stand is formed, i.e. the central body 5 is fastened to the base 4 by the second releasable connecting means 7.

**[0047]** In particular, through a weak forcing action, the male 9a and female 9b connectors related to the second pair of plug connectors are coupled. Said operation allows the two threaded units 11a belonging to the second means 7 to be disposed side by side and in particular the respective projecting portions 11c are substantially brought into mutual contact. In greater detail, the described coupling enables a substantially continuous thread to be created which consists of the two units 11a and the two projecting portions 11c, as shown in Fig. 4.

**[0048]** Finally, the connection block 11b is engaged through said thread, with units 11a and portions 11c making the base 4 and central body 5 integral with each other.

**[0049]** When locking of the central body 5 to the base 4 has been carried out, the lighting assembly 3 is secured through the first releasable connecting means 6. In particular, the male connector 8a is partly fitted into the female connector 9a. Subsequently, the connection assembly 10 is tightened, i.e. the cylindrical element 10a is screwed to the closing component 10c. In particular, this screwing operation is carried out through rotation of the lighting assembly 3 relative to body 5.

**[0050]** The invention enables important advantages to be achieved.

**[0051]** In fact, the lighting device 1 is simple and cheap.

**[0052]** Another advantage is represented by the great modular character of device 1. This is due to the advantageous presence of the connecting means 8 and 9 enabling the components and the aesthetics of the device to be varied in a simple and quick manner.

**[0053]** Another advantage is represented by the possibility of carrying out maintenance operations, if necessary, in a simple and cheap manner. Practically this is due to the presence of the connecting means 8 and 9 enabling replacement of possible unworking parts in a simple and inexpensive manner.

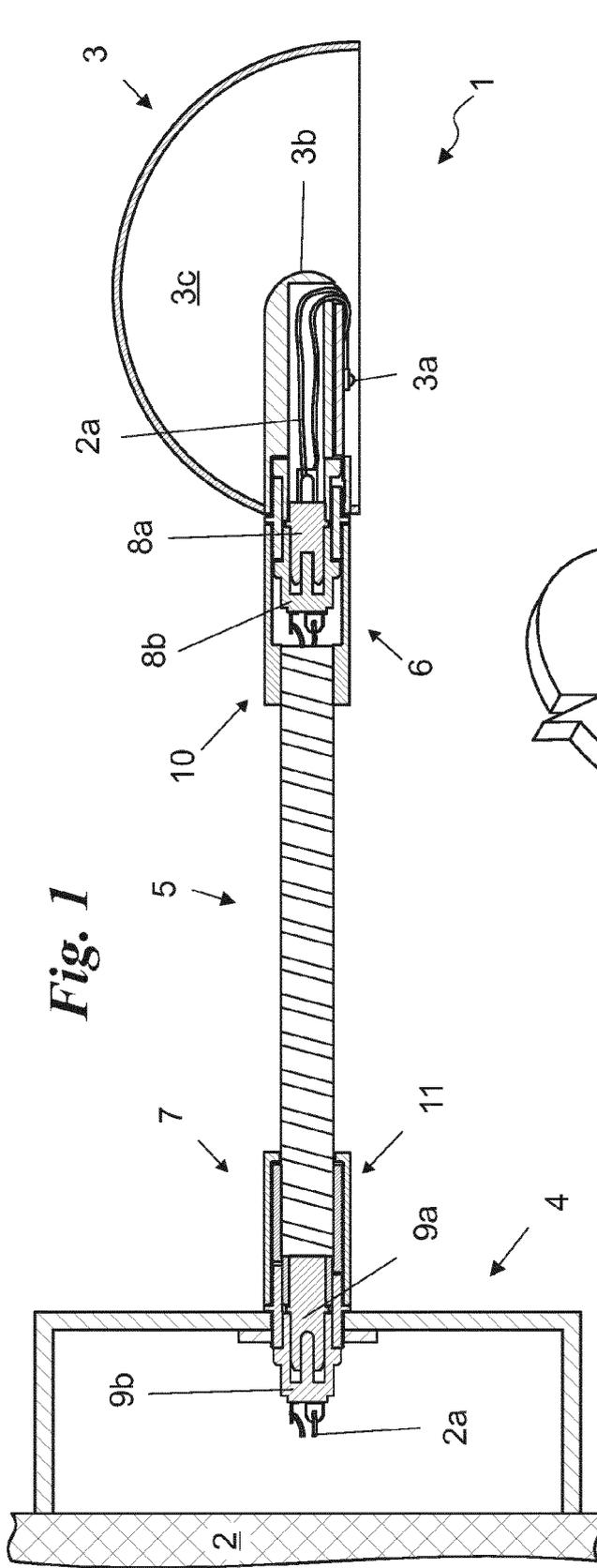
**[0054]** The invention is susceptible of variations falling within the scope of the inventive idea. For instance, while device 1 is preferably conceived for lamps or LEDs, different light sources can be used.

**[0055]** All of the details can be replaced by equivalent elements and the materials, shapes and sizes can be of any nature and magnitude.

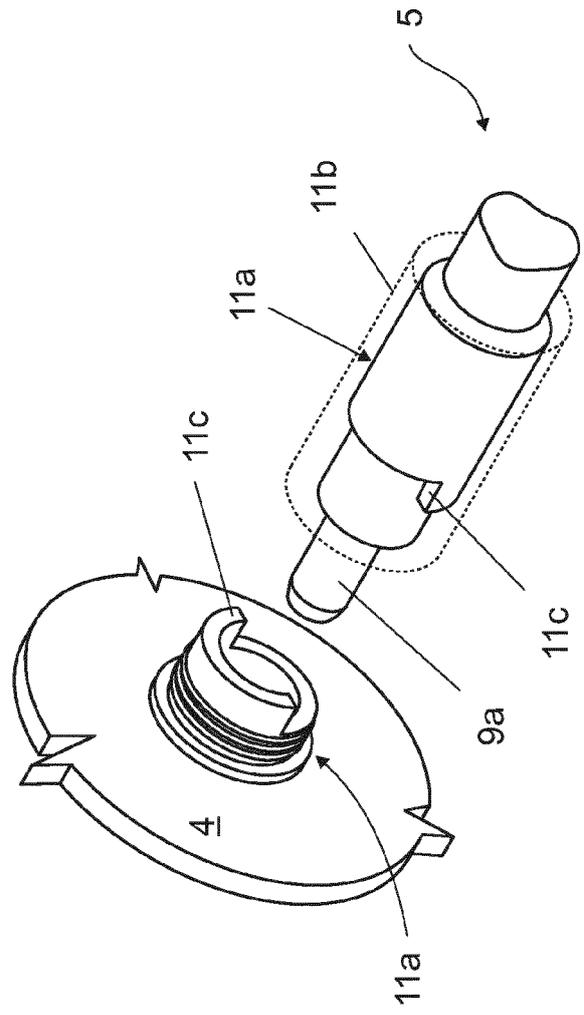
## Claims

1. A lighting device, in particular a LED lighting device (1) adapted to be disposed on a supporting structure (2), comprising at least one lighting assembly (3) in-

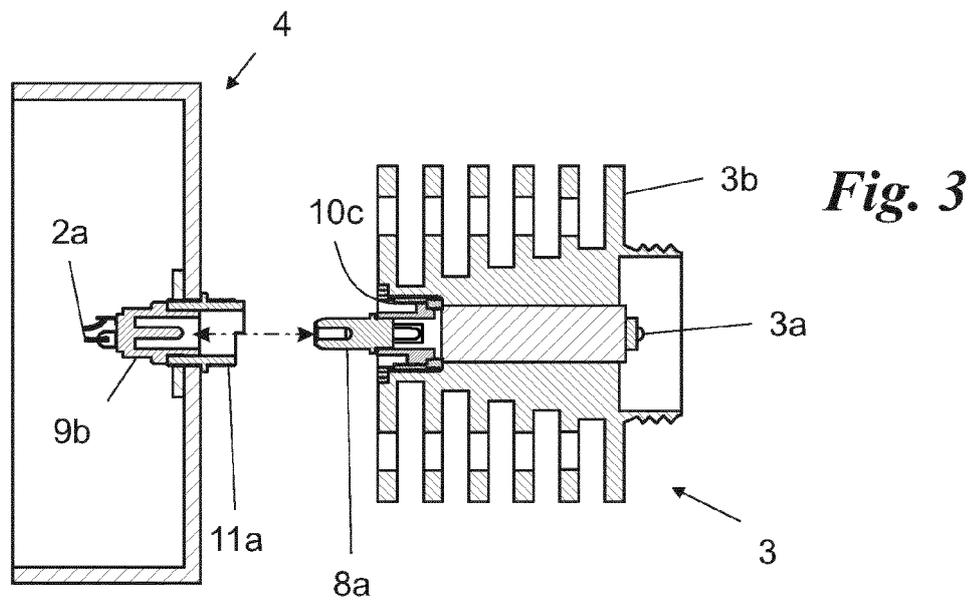
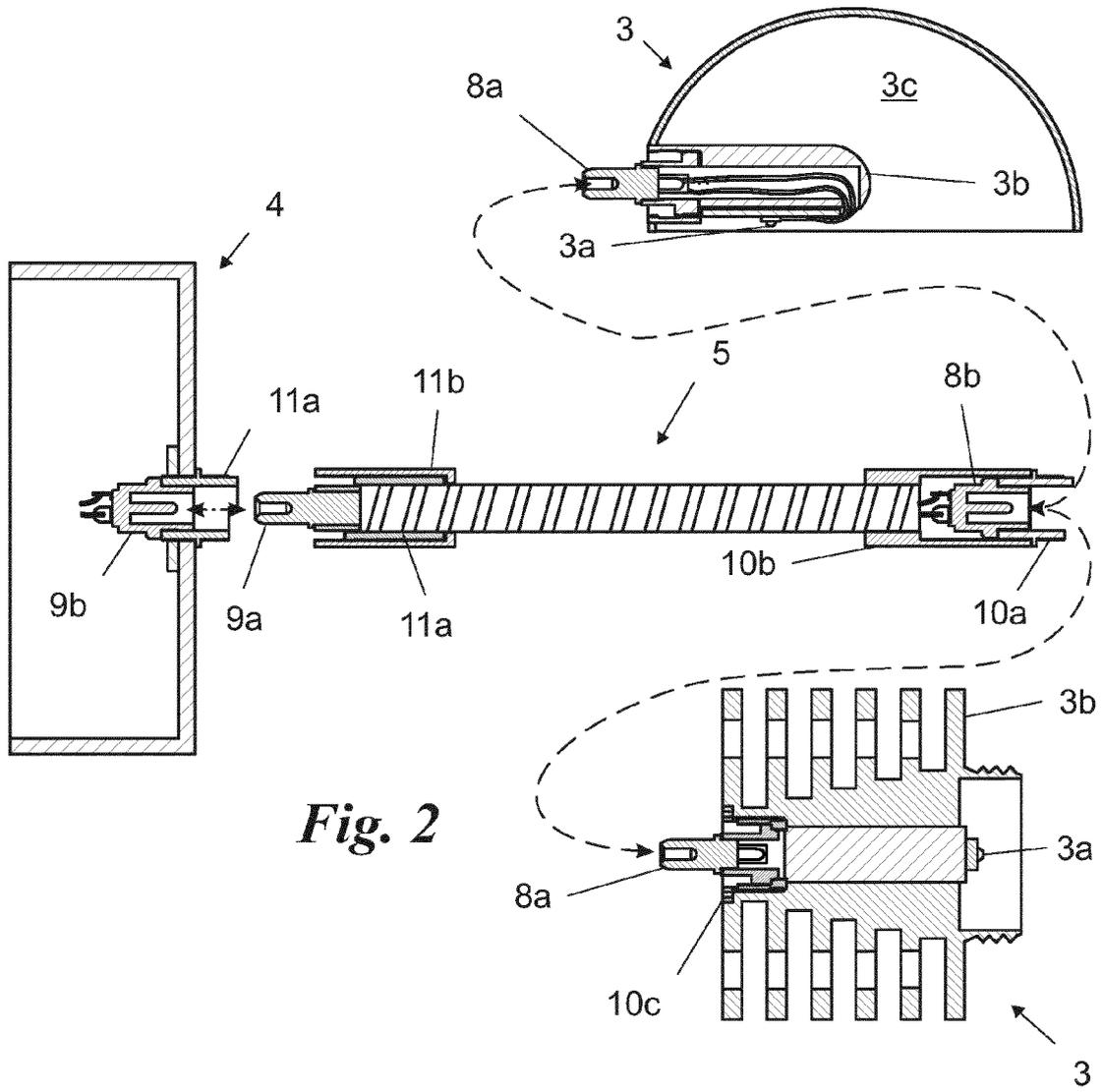
- cluding light-emitting means (3a); and a stand provided with electric connections (2a) terminating at said lighting assembly (3) and adapted to support said lighting assembly (3) and said stand enabling positioning of said device (1) on said supporting structure (2), **characterised in that** it comprises first releasable connecting means (6) adapted to mechanically secure said lighting assembly (3) to said stand and including a first pair of plug connectors suitable to carry out a current-passage connection between said lighting assembly (3) and said stand.
2. A device (1) as claimed in claim 1, wherein said stand has a base (4) suitable to enable placement of said device (1) on said supporting structure (2), and at least one central body (5) adapted to connect said lighting assembly (3) and said base (4), and wherein said releasable connecting means (6) is suitable to secure at least one of said lighting assemblies (3) to said central body (5).
3. A device (1) as claimed in claim 2, comprising second releasable connecting means (7) adapted to secure said base (4) to said central body (5), and wherein said releasable connecting means (7) includes a second pair of plug connectors suitable to establish a current-passage connection between said base (4) and said central body (5).
4. A device (1) as claimed in one or more of the preceding claims, wherein said first pair of plug connectors and second pair of plug connectors comprise a male connector (8a, 9a) and a female connector (8b, 9b), and wherein said male connector (8a, 9a) is a jack.
5. A device (1) as claimed in claim 4, wherein said central body (5) has one of said male connectors (8a, 9a) at one end and one of said female connectors (8b, 9b) at the other end.
6. A device (1) as claimed in one or more of the preceding claims, wherein said lighting assembly (3) comprises a dissipator adapted to dissipate the heat produced by said light-emitting means (3a).
7. A device (1) as claimed in one or more of the preceding claims, wherein said first connecting means (6) comprises a connection assembly (10) including a cylindrical element (10a) rigidly connected to said central body (5) provided with a male thread, and a closing component (10c) rigidly connected to said lighting assembly (3) and having a female thread adapted to engage with said connection element (10a).
8. A device (1) as claimed in one or more of claims 3 to 7, wherein said second connecting means (7) comprises a threaded connection member (11) suitable to stabilise the connection carried out by said second connecting means (7).
9. A device (1) as claimed in claim 8, wherein said threaded connection member (11) comprises two threaded units (11 a) provided with a male thread, each of which is rigidly connected to one of the components connected by said second connecting means (7), and a connection block (11 b) provided with a female thread and suitable to engage with said two units (11 a) so that said two components are mutually constrained.
10. A device (1) as claimed in claim 9, wherein the threads belonging to said connection assembly (10) and to said threaded connection member (11) are identical.

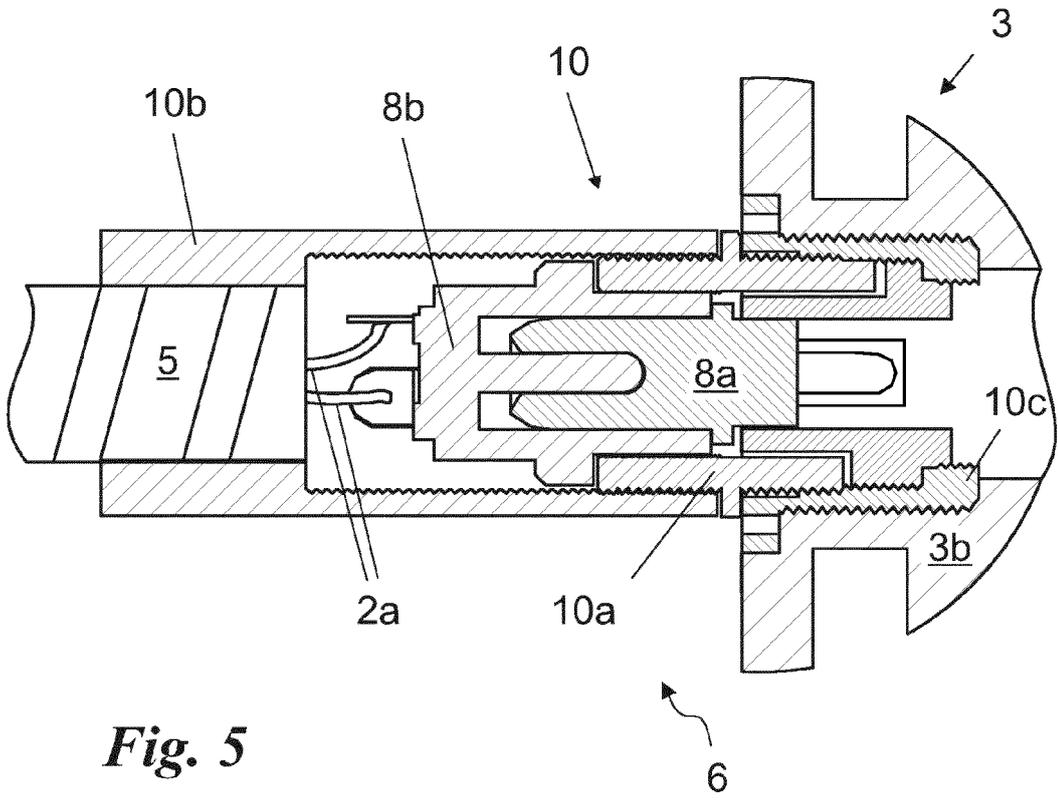


**Fig. 1**

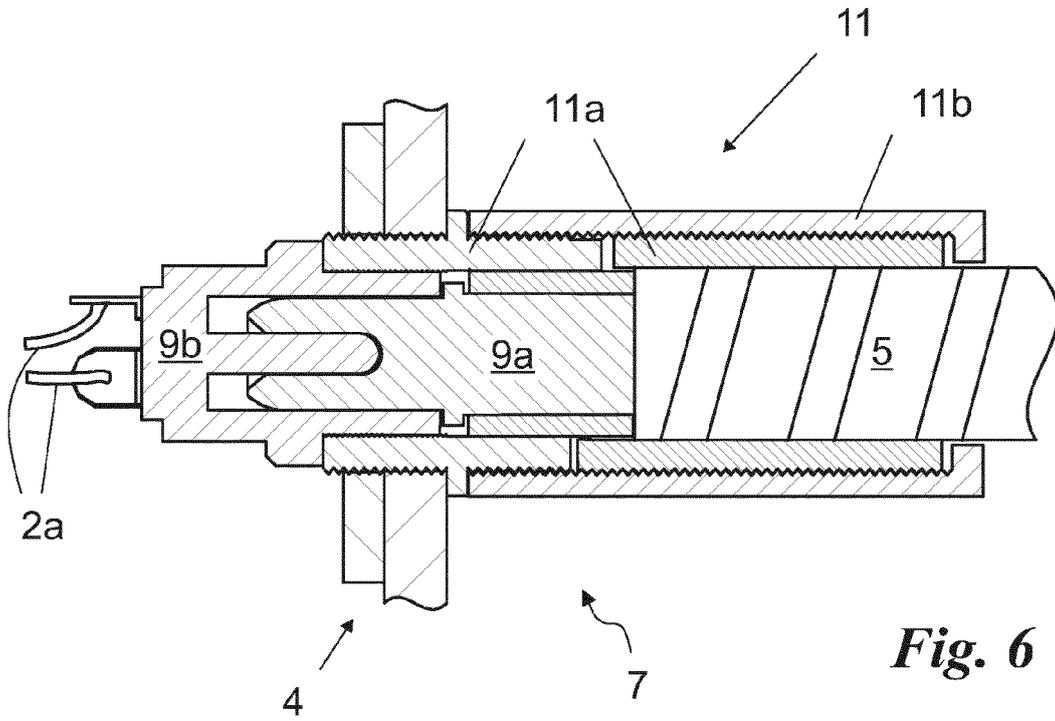


**Fig. 4**





**Fig. 5**



**Fig. 6**



EUROPEAN SEARCH REPORT

Application Number  
EP 11 18 4449

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	DE 20 2008 000762 U1 (LEDTECH ELECTRONICS CORP [TW]) 27 March 2008 (2008-03-27) * paragraph [0021] - paragraph [0038]; figures 1-8 *	1-5	INV. F21S6/00 F21V23/06
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Y	* paragraph [0016] - paragraph [0020]; figures 1-4 *	3-8	
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			TECHNICAL FIELDS SEARCHED (IPC)
			F21S F21V
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		9 January 2012	Arboreanu, Antoniu
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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