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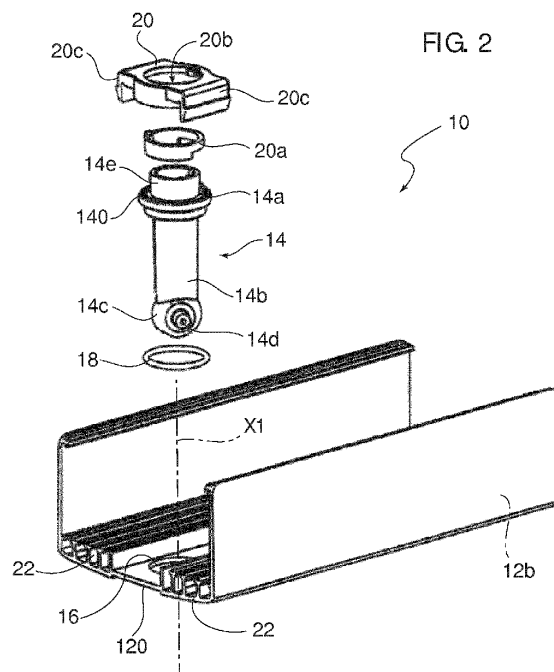
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(54) **Mounting device for lighting sources**

(57) A device for mounting a lighting source (L) on a carrier body (12) includes a wall (120) in the carrier body (12), the wall (120) having a hole (16) with a respective axis (X1), and a carrier arm (14) having an enlarged head portion (14a) and also a stem portion (14b). The carrier arm (14) is inserted in the hole (16) in the wall (120) of the carrier body (12) with the enlarged head portion (14a) resting on the periphery of the hole (16) in the wall (120) of the carrier body (12) internally of the carrier body (12) and the stem portion (14b) protruding outwardly of the carrier body (12). A retaining cap (20) fixed internally of the carrier body (12) urges the enlarged head portion (14a) of the carrier arm (14) towards the periphery of the hole (16) in the wall (120) of the carrier body (12) permitting rotation of the carrier arm (14) about the axis (X1) of the hole (16) in the wall (120) of the carrier body (12). An articulation joint (14d) makes it possible to mount a lighting source (L) at the distal end (14c) of the carrier arm (14); this joint has an articulation axis (X2) transverse to the axis (X1) of the hole (16) in the wall (120) of the carrier body (12).



Description

Technical field

[0001] The description relates to devices for mounting lighting sources.

[0002] Various embodiments can relate to the mounting of solid-state lighting sources, for example of the LED type.

Technical background

[0003] Known devices for mounting lighting sources can provide for the use of joints of various types (for example to allow the orientation of the lighting source).

[0004] To use these devices, it may be necessary to have tools and/or fixing elements, sometimes having to resort to additional external elements of various kinds.

Object and summary

[0005] In the context of application indicated above, there is a need for solutions which make it possible to satisfy one or more of the following requirements:

- the possibility to rotate the light source, in particular through an angle of 360° and beyond, by simply applying, for example by hand, a torque,
- the possibility to connect a joint mounting element or arm (made of a plastic material or of any other material) to a carrier body, for example in the form of an extruded profile, without having to have specific tools or fixing devices,
- avoiding a situation where the weight of the lighting source has to be supported by elements such as caps or nuts, and/or
- allowing the passage of electrical wires through the mounting device.

[0006] It is an object of various embodiments to satisfy the requirement outlined above.

[0007] Various embodiments achieve this object owing to a mounting device having the features indicated specifically in the claims which follow.

[0008] The claims form an integral part of the technical teaching provided here in relation to the invention.

[0009] Various embodiments can provide for one or more of the following features:

- the presence of a washer element and/or of an elastic gasket element between a carrier body, for example an extruded carrier body, and an articulated carrier arm for the lighting source,
- the presence of a carrier arm which can be connected to a carrier body, for example an extruded carrier body, in a simple manner, for example by means of a cap adjoining the head portion of the carrier arm,
- configuring the carrier arm in a manner substantially

identical to a mushroom or hammer shape, i.e. with an enlarged head portion, and

- the possibility to produce at least the carrier arm in the form of a hollow tubular structure which allows for the passage of electrical wires.

[0010] Various embodiments make it possible to obtain low production costs, easy mounting and reliable use.

[0011] Various embodiments make it possible to control the orientation of the lighting source by applying, for example by hand, a calibrated torque, with the possible capability, on the part of the mounting device, to maintain the control position assigned thereto.

[0012] Various embodiments make it possible to produce structures which are on the whole thin and have dimensions so as to allow the passage, in their interior, of electrical wires even of a large cross section.

Brief description of the figures

[0013] Various embodiments will now be described, purely by way of non-limiting example, with reference to the accompanying figures, in which:

- figure 1 is a general perspective view of a mounting device for lighting sources supporting in mounted form one such source,
- figure 2 is an exploded perspective view of a device according to embodiments,
- figure 3 is a perspective view showing the device shown in figure 2 in a mounted state, and
- figure 4 reproduces, on an enlarged scale, the portion in figure 3 indicated by IV.

Detailed description

[0014] In the following description, various specific details aimed at providing a fuller understanding of various exemplary embodiments are explained. The embodiments may be implemented without one or more of the specific details or using other methods, components, materials, etc. In other cases, known structures, materials or operations are not shown or described in detail so that the various aspects of the embodiments may be understood more clearly.

[0015] The reference to "an embodiment" in the context of this description indicates that a particular configuration, structure or feature described in relation to the embodiment is included in at least one embodiment. Therefore, phrases such as "in one embodiment", which may occur at various points in this description, do not necessarily refer to the same embodiment. Moreover, particular forms, structures or features may be combined in any suitable manner in one or more embodiments.

[0016] The reference signs used here are provided

solely for the sake of convenience and therefore do not define the scope of protection or ambit of the embodiments.

[0017] In the figures, reference sign 10 denotes as a whole a device for mounting lighting sources.

[0018] The exemplary embodiment considered here relates to a mounting device 10 which makes it possible to mount, on a supporting surface such as a ceiling or a false ceiling S, a light lighting source L formed, for example, by a spotlight. This may be, for example, a lighting source L which can use, as a light radiation source LS, a solid-state light radiation source, for example an LED source.

[0019] Even though they are shown here for illustrative clarity and ease of understanding, the lighting source L and in particular the light radiation source LS can be intended to be coupled to the device in accordance with various embodiments only with a view to installation.

[0020] In various embodiments, as exemplified here, the device 10 is intended to allow the orientation of the lighting source L (and therefore the orientation of the light radiation beam emitted by the source LS) with respect to:

- a first axis X1, which, in the mounting position shown here by way of example (with reference to mounting on a ceiling or false ceiling S extending in a substantially horizontal plane), can be oriented in a substantially vertical direction, and
- a second axis X2, which extends in a generically transverse direction with respect to the first axis X1 and therefore, in the example considered here, can be oriented in a substantially horizontal direction.

[0021] In various embodiments, even though it is transverse with respect to the first axis X1, the second axis X2 may not be orthogonal thereto and may be, for example, oriented in a bent or oblique direction with respect to the axis X1.

[0022] In various embodiments, the following may be identifiable within the scope of the mounting device 10:

- a carrier body 12, which can be fixed to the supporting surface, such as the ceiling or false ceiling S, for example by means of an upper wall 12a provided with holes H (according to the current methods of use for mounting the lighting rails), and
- a carrier arm 14, which protrudes from the carrier body 12 with the capability to extend in a connecting manner between the carrier body 12 and the lighting source L.

[0023] In the solution presented here by way of example, with the carrier body 12 mounted in a ceiling, the carrier arm 14 can extend downwards starting from the carrier body 12, in such a manner that the lighting source L is as it were suspended on the carrier body 12.

[0024] According to the embodiments, the carrier body 12 can have different structures and shapes.

[0025] The examples presented in the figures relate to a carrier body 12 including two profiled bodies 12a, 12b (for example made of a metallic material or a pressed plastic material) which have a channel-like structure and are coupled to one another, with the channel-like structures being arranged so as to mutually face one another and so as to be mutually orthogonal in relation to one another so as to jointly define a box-like carrier body 12 having a parallelepiped shape. In the exemplary embodiments under consideration here, the body 12a is that intended to be fixed to the mounting surface (for example the ceiling or false ceiling S) and the body 12b is that which carries the carrier arm 14.

[0026] In various embodiments, the two bodies 12a and 12b can be coupled to one another, for example, by means of a snap coupling, or by means of screws or other known fixing devices.

[0027] In various embodiments, the body 12b can include an extruded profile, for example of aluminum, light metal material, plastic.

[0028] In various embodiments, the carrier body 12 can have structures and shapes which differ entirely from those presented here by way of example.

[0029] In the exemplary embodiments under consideration here, the carrier body 12, for example the portion 12b, can have a wall (at the bottom, in the mounting condition presented here by way of example) denoted by 120, in which a hole 16 having an axis is made.

[0030] In various embodiments, this axis can coincide with the first axis of orientation of the lighting source L which has already been introduced, with reference to figure 1. For this reason, in figures 2, 3 and 4, the axis of the hole 16 is in actual fact denoted by the reference sign X1.

[0031] In various embodiments, the hole 16 can be a circular hole.

[0032] In various embodiments, the carrier arm 14, which can be inserted in the hole 16, may include:

- an enlarged head portion 14a, and
- a stem portion 14b having a distal end 14c (opposite to the enlarged head portion 14a).

[0033] In various embodiments, the distal end 14c can be configured, for example by means of the presence of one or more pins or shafts 14d, in such a way as to produce, in the coupled state with the lighting source L, a joint or articulation capable of allowing the orientation of the lighting source L about an articulation axis which can coincide with the axis X2 already introduced beforehand, with reference to figure 1.

[0034] For this reason, the axis of the pin or of the pins 14d is also denoted by the reference sign X2 in figure 3.

[0035] As can be seen more clearly by comparing the views of figure 2 (exploded perspective view) and of figure 3 (assembled perspective view), in various embodiments the carrier arm 14 can be inserted in the hole 16 in such a way that the enlarged head portion 14a can

rest on the periphery of the hole 16 provided in the wall 120 of the carrier body 12 internally with respect to the carrier body 12.

[0036] In various embodiments, the enlarged head portion 14a of the carrier arm 14 can rest on the periphery of the hole 16 with the interposition of an annular gasket 18.

[0037] In various embodiments, the gasket 18 can be elastic and/or can be assimilated with an O-ring.

[0038] In various embodiments, with the carrier arm 14 inserted in the hole 16, the stem part or portion 14b of said arm 14 can protrude outwardly of the carrier body 12 and therefore support, at the distal end 14c thereof, the lighting source L.

[0039] The reference sign 20 denotes a retaining cap which can be fixed to the carrier body 12 internally thereof in such a way as to act on the carrier arm 14 to urge the enlarged head portion 14a to rest on the periphery of the hole 16 (possibly with the interposition of the gasket 18).

[0040] For this purpose, the cap 20 can include a washer portion 20a (in one piece or separate) facing the enlarged head portion 14a of the carrier arm 14 and rotatably cooperating therewith, for example in as much as the washer portion 20a is fitted onto an end tang 14e of the carrier arm 14 which protrudes beyond the enlarged head portion 14a.

[0041] The carrier arm 14 (and the lighting source L carried thereby at the distal end 14c thereof) can be made to rotate about the axis X1 of the hole 16, thus making it possible to implement a rotational movement (for example through 360° or more) in the horizontal plane, as shown by the double-headed arrow AA' in figure 1.

[0042] In various embodiments, the mounting device shown can have a passageway for electrical wires directed towards the lighting source L.

[0043] In various embodiments, this passageway can involve:

- the fact that the carrier arm 14 has a tubular structure and thus has a longitudinal (axial) cavity for the passage of these electrical wires, and/or
- the fact that the cap 20 has an overall annular structure with a central opening 20b for the passage of electrical wires, which can then extend through the longitudinal cavity of the carrier arm 14.

[0044] In various embodiments, as can be seen more clearly in the enlarged view of figure 4, the enlarged head portion 14a of the carrier arm 14 and the cap 20 (for example the washer portion 20a thereof) can have mutually facing surfaces comprising at least one sculptured surface with the function of braking the rotational movement of the carrier arm 14 about the axis X of the hole 16.

[0045] In the exemplary embodiment shown in figure 4, this solution can be achieved in that the enlarged head portion 14a of the carrier arm 14 has, facing towards the cap 20 (thus towards the washer 20a), a row of radial ribs 140 intended to perform the aforementioned braking

action, acting frictionally against a protruding portion of the cap 20 and/or against the circular ring surface of the washer portion 20a which faces towards the enlarged head portion 14a.

[0046] In various embodiments, the aforementioned braking action (the intensity of which can also be determined by the degree of elasticity of the gasket 18) can have the function of ensuring that the carrier arm 14 (and the lighting source L carried thereby) maintain their position with respect to the axis X1, towards which these elements have been moved, for example, by a simple manual rotational action exerted on the lighting source L.

[0047] For fixing the cap 20 to the carrier body 12, for example on the inner side of the wall 120, various embodiments can provide for the presence, laterally with respect to the hole 16, of ribs 22 (which can be easily formed in the body 12b when the latter is in the form of an extruded profile) intended to cooperate in a hook-like link with the cap 20.

[0048] In various embodiments, the cap 20 can have a general channel-like shape with lateral extensions 20c having a distal hook-like formation 20d (see for example figure 4). The formation 20d can hook onto the ribs 22 (which for this purpose can have enlarged head portions) so as to allow coupling of the cap 20 to the carrier body 12 in a general snap-type coupling configuration.

[0049] As regards the formation of the articulation or joint at the distal end 14c of the carrier arm 14, the presence of the pins 14d exemplified here of course constitutes one of various possibilities which can be used to make it possible to implement the vertical pivoting movement of the light source L according to the double-headed arrow BB' in figure 1.

[0050] In various embodiments, the aforementioned form of articulation about the articulation axis X2 can be implemented with a configuration which is complementary with respect to that exemplified here: in particular, instead of providing one or more pins 14d which are carried by the distal end 14c of the arm 14 and are intended to engage in one or more corresponding openings (not shown in the drawings) provided in the light source L, it is possible to consider providing the pin or pins in question on the light source and the opening or openings at the distal end 14c of the arm 14.

[0051] Without affecting the principle of the invention, the constructional details and embodiments may therefore vary, also significantly, with respect to that illustrated here purely by way of non-limiting example, without thereby departing from the scope of protection: this scope of protection is defined by the accompanying claims.

Claims

1. A device for mounting a lighting source (L) on a carrier body (12), the device including:

- a wall (120) in the carrier body (12), the wall

- (120) having a hole (16), the hole having an axis (X1),
 - a carrier arm (14) having an enlarged head portion (14a) and a stem portion (14b), the carrier arm (14) inserted in the hole (16) in the wall (120) of the carrier body (12) with the enlarged head portion (14a) resting on the periphery of the hole (16) in the wall (120) of the carrier body (12) internally of the carrier body (12) and the stem portion (14b) protruding outwardly of the carrier body (12);
 - a retaining cap (20) fixed internally of the carrier body (12) and urging the enlarged head portion (14a) of the carrier arm (14) towards the periphery of the hole (16) in the wall (120) of the carrier body (12) permitting rotation of the carrier arm (14) about the axis (X1) of the hole (16) in the wall (120) of the carrier body (12), and
 - an articulation joint (14d) for mounting the lighting source (L) at the distal end (14c) of the carrier arm (14), the articulation joint (14d) having an articulation axis (X2) transverse to the axis (X1) of the hole (16) in the wall (120) of the carrier body (12).
2. The device as claimed in claim 1, wherein the retaining cap (20) includes a washer portion (20a) facing the enlarged head portion (14a) of the carrier arm (14) and rotatably cooperating therewith.
 3. The device as claimed in claim 1 or claim 2, wherein the enlarged head portion (14a) of the carrier arm (14) rests against the periphery of the hole (16) in the wall (120) of the carrier body (12) with the interposition of an annular, preferably elastic, gasket (18).
 4. The device as claimed in any of the preceding claims, wherein the hole (16) in the wall (120) of the carrier body (12) is a circular hole.
 5. The device as claimed in any of the preceding claims, including a passageway for electrical conductors, the passageway involving at least one of:
 - the carrier arm (14) being tubular and having a longitudinal passage cavity for electrical conductors, and/or
 - the retaining cap (20) being annular with a central passage opening (20b) for electrical conductors.
 6. The device as claimed in any of the preceding claims, wherein the enlarged head portion (14a) of the carrier arm (14) and the retaining cap (20) have at least one sculptured surface (140) to brake the rotation of the carrier arm (14) about the axis (X1) of the hole (16) in the wall (120) of the carrier body (12).
 7. The device as claimed in any of the preceding claims, wherein the wall (120) of the carrier body (12) has internal ribs (22) extending sidewise with respect to the hole (16) in the wall (120) of the carrier body (12), the retaining cap (20) being anchored, preferably by snap-engagement, to the internal ribs (22) of the wall (120) of the carrier body (12).
 8. The device as claimed in claim 7, wherein the retaining cap (20) carries hook-like formations (20c) for coupling with the internal ribs (22) of the wall (120) of the carrier body (12).
 9. The device as claimed in any of the preceding claims, wherein the distal end (14c) of the carrier arm (14) carries at least one articulation shaft (14d) for mounting said lighting source (L), said at least one shaft (14d) extending along said articulation axis (X2).
 10. The device as claimed in any of the preceding claims, having a lighting source (L) coupled to the carrier joint (14d) at the distal end (14c) of the carrier arm (14), the lighting source (L) being rotatable about the axis (X1) of the hole (16) in the wall (120) of the carrier body (12) and tiltable about the articulation axis (X2) transverse to the axis (X1) of said hole (16).

FIG. 1

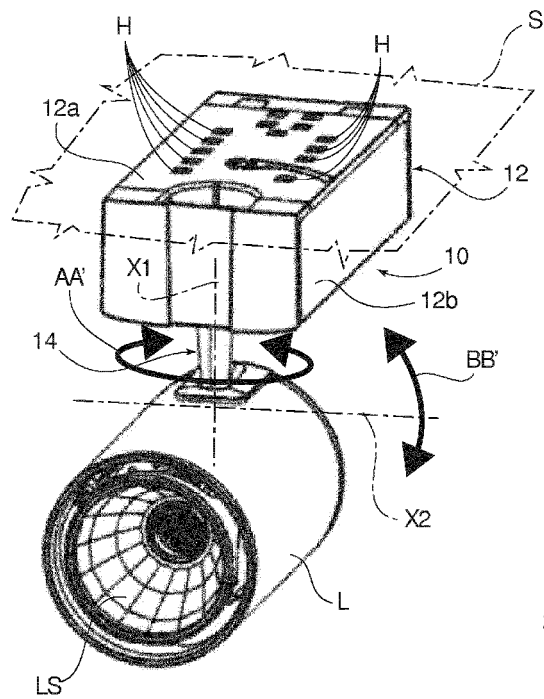


FIG. 2

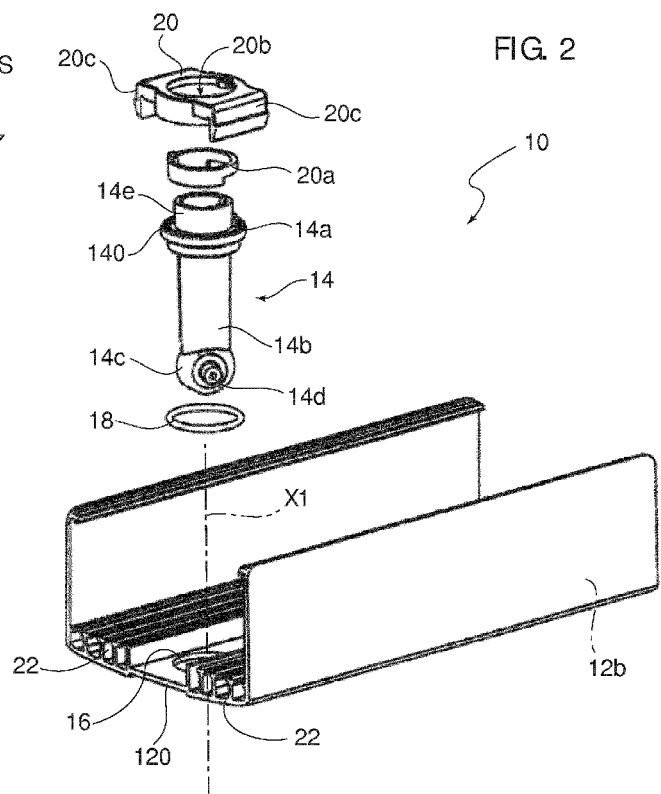


FIG. 3

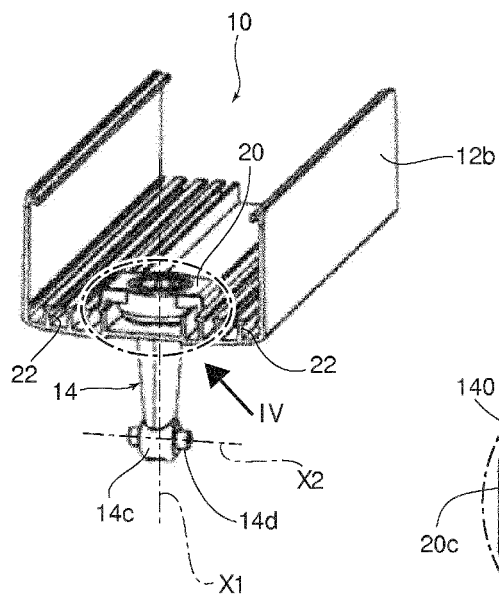
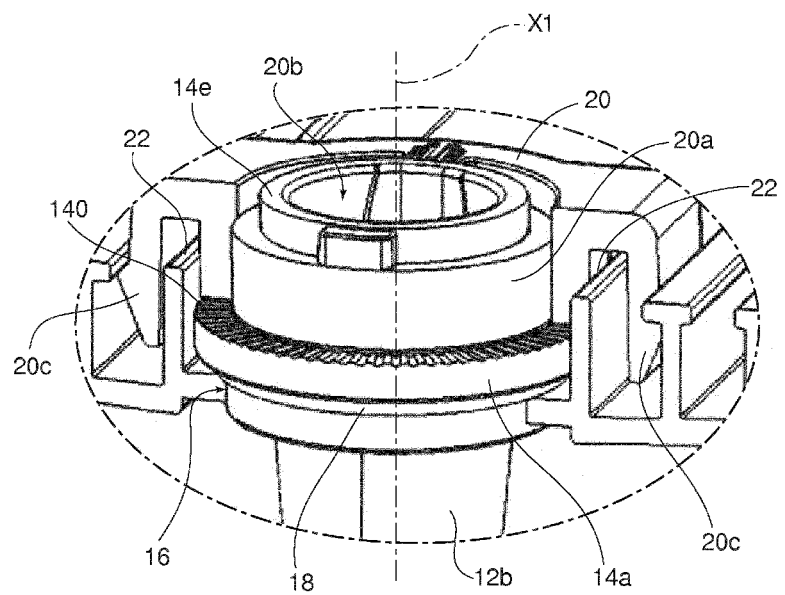


FIG. 4





EUROPEAN SEARCH REPORT

Application Number
EP 13 18 2188

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2011/018776 A1 (NUALIGHT LTD [IE]; GUENEBAUT VINCEN [IE]; HENNESSY THOMAS [IE]; WALSHE) 17 February 2011 (2011-02-17) * page 4, line 9 - page 6, line 12; figures 1-12 *	1-10	INV. F21V21/26 F21V21/30
A	US 2004/233676 A1 (MATTS MONTE E [US] ET AL) 25 November 2004 (2004-11-25) * paragraph [0021] - paragraph [0040]; figures 1-3 *	1-10	
A	US 6 100 803 A (CHANG WEN-HSIANG [TW]) 8 August 2000 (2000-08-08) * column 2, line 21 - column 3, line 52; figures 1-9 *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21V F16C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 January 2014	Examiner 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
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 18 2188

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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02-01-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011018776 A1	17-02-2011	EP 2464912 A1	20-06-2012
		IE 20100485 A1	16-03-2011
		US 2012212932 A1	23-08-2012
		WO 2011018776 A1	17-02-2011

US 2004233676 A1	25-11-2004	US 2004233676 A1	25-11-2004
		US 2005128755 A1	16-06-2005
		US 2007258252 A1	08-11-2007

US 6100803 A	08-08-2000	NONE	
