



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.04.2011 Bulletin 2011/17

(51) Int Cl.:
F21S 8/02 (2006.01) F21V 21/30 (2006.01)

(21) Application number: **09173750.2**

(22) Date of filing: **22.10.2009**

(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
Designated Extension States:
AL BA RS

(71) Applicant: **Antares Iluminación, S.A.**
46190 Ribarroja (Valencia) (ES)

(72) Inventor: **Martinez Weber, Federico**
46190 Ribarroja (Valencia) (ES)

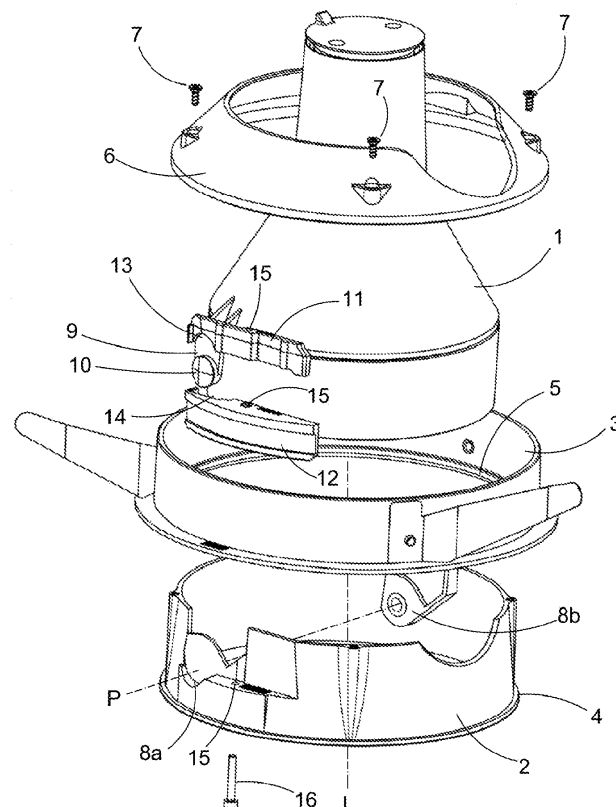
(74) Representative: **Gallego Jiménez, José Fernando**
BGA - Barroso, Garo & Asociados,
Avda. Diagonal 421, 2o
08008 Barcelona (ES)

(54) **Lighting device**

(57) The lighting device comprises a spotlight (1), a support (3), rotating means of the spotlight (1) with respect to a first pivot axis (B), rotating means of the spotlight (1) with respect to a second axis (L), locking means of said rotating means of the spotlight (1) with respect to a first pivot axis (B) and locking means of said rotating

means of the spotlight (1) with respect to a second axis (L). It is **characterized in that** it comprises a single actuation element (16) for all the locking means and in that the locking means of the rotating means of the spotlight (1) with respect to a first pivot axis (P) act directly on said pivot axis (P).

Fig.1



Description

[0001] The present invention relates to a lighting device, especially of the recessed type.

BACKGROUND OF THE INVENTION

[0002] Recessed lighting devices that are generally installed in ceilings and that allow to orientate a spotlight in the desired direction are known. Thanks to this feature, it is possible to address the beam of light of the lighting device towards a determined area without having to dismount said device.

[0003] A problem related with this type of lighting devices is that the position of the spotlight can vary once it has been arranged in the desired orientation, due to its own weight, to the force of compression or traction exerted by power supply wirings or to an impact or contact with an external element.

[0004] In the document EP 1923623 a lighting device comprising a spotlight linked to a support and that rotates with respect to a first pivot axis and with respect to a second axis, is disclosed. In order to rotate the spotlight with respect to both previously mentioned axes, the device comprises a pair of actuation mechanisms. The first mechanism is actuated by means of a screwdriver and rotates the spotlight with respect to the first axis. The second mechanism is also actuated by means of a screwdriver and rotates the spotlight with respect to the second axis.

[0005] Said lighting device allows the rotational and angular orientation of the spotlight and it allows to fix it in the desired position, as when the actuation mechanisms are not actuated the spotlight remains locked and does not move. Nevertheless, this device has the drawback that the actuation of the mechanisms is slow, as it is necessary to rotate each of them by means of a screwdriver. Likewise, the presence of said actuation mechanisms (a screw mechanism and a gear pinion-tooth wheel mechanism) increases the manufacturing cost and the complexity of the lighting device.

[0006] Another lighting device known in the art comprises a spotlight linked to a support and rotating with respect to a first pivot axis and with respect to a second axis. This lighting device comprises a locking device that allows to fix the position of the spotlight. The locking device comprises a pair of brake elements. Each brake element consists of a screw, a lateral wing of the spotlight and a break shoe screwed to the free end of the screw. The screw passes through a ring, with respect to which the spotlight pivots, and through a slot present in the lateral wing.

[0007] When said screw is tightened, the break shoe slides towards a support surface, until contacting the same, so that if the screw continues being tightened, the break shoe exerts enough pressure on the support and avoids the spotlight for being rotational orientated. At the same time, when the break shoe moves, it presses a

spring arranged around the screw and situated between a part of said break shoe and the slot present in the lateral wing of the spotlight. Said spring exerts a pressure on said wing, so that the longitudinal position of the screw inside the slot is blocked, thus avoiding the pivoting of the spotlight.

[0008] Said lighting device has the drawback of requiring the actuation of two screws to fix the position of the spotlight. Furthermore, the locking system of the pivoting movement of the spotlight is not effective, as the pressure of the spring on the wing does not allow to completely fix the position of the spotlight. Likewise, said system makes necessary to conform at least a pair of lateral wings in the spotlight, thus complicating its manufacturing and increasing its volume.

DESCRIPTION OF THE INVENTION

[0009] The object of the present invention is to overcome the drawbacks that the devices know in the art have, by providing a lighting device that comprises a spotlight, a support, rotating means of the spotlight with respect to a first pivot axis, rotating means of the spotlight with respect to a second axis, locking means of said rotating means of the spotlight with respect to a first pivot axis and locking means of said rotating means of the spotlight with respect to a second axis, characterized in that it comprises a unique actuation element for all the locking means and in that the locking means of the rotating means of the spotlight with respect to a first pivot axis operate directly on said pivot axis.

[0010] Preferably, the actuation element comprises a screw.

[0011] Advantageously, the locking means of the rotating means of the spotlight with respect to a first pivot axis comprise a first piece, which presses a part of said pivot axis, thus avoiding the spotlight to rotate with respect to the same.

[0012] Also advantageously, the locking means of the rotating means of the spotlight with respect to a second axis comprise a second piece which presses a part of the support, thus avoiding the spotlight to rotate with respect to said second axis.

[0013] According to an embodiment of the present invention, the screw is linked to the spotlight, to the first piece and to the second piece, so that when the screw is tightened the first piece presses a part of the pivot axis of the spotlight against the second piece, thus locking the rotation of the spotlight with respect to said pivot axis, and the second piece presses a part of the support, thus locking the rotation of the spotlight with respect to the second axis.

[0014] Thanks to these features, it is possible to obtain a lighting device that allows to orientate the spotlight easily and without needing tools, and that also allows fixing the position of said spotlight by means of the actuation of a unique screw, simplifying and quickening in this way the operation of locking the position of the spotlight.

[0015] Furthermore, since the locking means act directly on the pivot axis of the spotlight it is possible to apply the retaining force in a more effective way and without intermediate elements, by completely locking the pivoting movement of said spotlight.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] In order to facilitate the description of what is mentioned above, some drawings schematically representing a practical embodiment of the lighting device according to the invention as a non-limitative example, but just by way of example, are included, wherein:

Figure 1 is an exploded view of the lighting device according to the present invention;
Figure 2 is a partial sectional view of the lighting device of Figure 1 installed, where the locking elements of the position of the spotlight can be seen; and
Figures 3 and 4 are views in detail showing the actuation of the elements for locking the position of the spotlight of the lighting device according to the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0017] In Figure 1 an exploded view of a lighting device according to the present invention can be seen.

[0018] The device basically comprises a spotlight 1, a rotatable ring 2 and a ring-shaped support 3 which is intended to be fixed to the ceiling or to any similar element. The rotatable ring 2 can rotate with respect to the support 3, and the spotlight 1 is articulated with respect to the rotatable ring 2, so that it can pivot with respect to the same.

[0019] More specifically, the rotatable ring 2 is housed inside the support 3 when the lighting device is installed. As one can see also in Figure 2, the ring 2 comprises a lower flange 4 that rests on the lower surface of a flange 5 inside the support 3. The device also comprises a rear lid 6 that is attached to the ring 2 at the opposed side of the support 3, by means of some screws 7. Said lid 6 retains the ring 2 with respect to the support 3 in longitudinal direction, as the lid 6 rests on the upper edge of the support 3.

[0020] In this way, the ring 2 cannot move longitudinally with respect to the support 3, but can rotate with respect to the same, about the longitudinal axis L, that matches with the longitudinal axis L of the support 3.

[0021] The ring 2 comprises two opposed supports 8a, 8b on which two legs 9 rest in an articulated way with respect to the spotlight 1 (only one of the legs 9 can be seen in the figures). One of the supports 8b essentially comprises an orifice through the wall of the ring 2, through which a rivet or through hole (not shown) passes that also passes through an orifice in the corresponding leg 9 (hidden in the figures), so that said leg 9 can rotate with respect to the ring 2 about said support 8b. The other

support 8a comprises a seat having a substantially semicircular shape on which a circular protrusion 10, which is present at the end of the other leg 9 of the spotlight, rests. In this way, both supports 8a and 8b and the two legs 9 form a pivot axis P with respect to which the spotlight 1 can rotate inside the ring 2. Hence, as one can see, the spotlight 1 can rotate about the longitudinal axis L in order to vary its rotational orientation and can rotate with respect to the pivot axis P in order to vary its angular orientation. This allows to orientate the spotlight 1 in the desired direction.

[0022] As showed in figures 1 and 2, the lighting device further comprises a first piece 11 and a second piece 12, the function of which will be explained more in detail in the following.

[0023] The piece 11 comprises a lengthened body and is arranged on the circular protrusion 10 of the leg 9 of the spotlight 1. The piece 11 comprises a lower recess 13 with a shape and an upper surface in correspondence with the outline of the top of the protrusion 10.

[0024] The piece 12 also comprises a lengthened body, and it is arranged below the protrusion 10. The piece 12 comprises an upper recess 14 with a shape and a lower surface in correspondence with the outline of the lower part of the protrusion 10.

[0025] When the device is installed, the piece 11 is arranged on the protrusion 10, and said protrusion 10 is located inside the recess 13. The piece 12 is arranged below the protrusion 10, in correspondence with the support 8a of the ring 2 and partially resting on the same. The protrusion 10 is also located inside the recess 14. In this way, the protrusion 10 of the leg 9 of the spotlight 1 is located in a circular housing formed by the recesses 13 and 14 of the elements 11 and 12 that surrounds all the perimeter of said protrusion 10. Likewise, the piece 11 partially rests on the piece 12 and the piece 12 is arranged on the flange 5 of the support 3.

[0026] Each of the pieces 11 and 12 comprise through orifices 15. The orifice 15 of the piece 11 is inwardly threaded. The ring 2 also comprises a through orifice 15. As one can see in the figures, when the lighting device is installed the orifices 15 of the elements 11 and 12 and of the ring 2 are aligned.

[0027] A screw 16 is inserted through the orifices 15, so that it passes through the ring 2, the piece 12 and the piece 11. The head of the screw 16 is arranged in a seat of the lower surface of the (hidden) ring 2. Due to the fact that the orifice 15 of the piece 11 is inwardly threaded, the screw 16 holds the elements 11 and 12 with respect to the ring 2.

[0028] In Figure 3, the screw 16 is in a not tightened condition. In this situation, the piece 11 is slightly separated from the piece 12, so that the respective recesses 13 and 14 receive the protrusion 10 of the leg 9 of the spotlight 1 with clearance. Likewise, the piece 12 is arranged on the flange 5 of the support 3 without exerting any significant force.

[0029] Hence, in the situation shown in Figure 3, the

ring 2, together with the spotlight 1 articulated to the same, can rotate with respect to the support 3 about the longitudinal axis L, and the spotlight 1 can pivot with respect to the ring 2 about the pivot axis P, as the protrusion 10 is housed with clearance in the recesses 13 and 14 of the respective elements 11 and 12.

[0030] In Figure 4, the screw 16 has been tightened. When tightening the screw 16 by rotating it clockwise, the piece 11, which is screwed at the free end of said screw 16, vertically moves down. When moving down, the piece 11 gets closer to the piece 12, so that the clearance present between the recesses 13 and 14 of the corresponding pieces 11 and 12 and the protrusion 10 disappears. Hence, the protrusion 10 is pressed by the inner surfaces of said recesses 13, 14. In this way, the spotlight 1 cannot rotate with respect to the ring 2 about the axis P, as the protrusion 10 is pressed and blocked in rotation with respect to the pieces 11 and 12.

[0031] When the screw 16 is tightened and the piece 11 moves down, said piece 11 pushes the piece 12 down. When the piece 12 is pushed down, its underside presses against the upper surface of the flange 5 of the support 3. This pressure causes a frictional force between the piece 12 and the flange 5 of the support 3 that avoids that the assembly formed by the ring 2 and the spotlight 1 can rotate with respect to the support 3 about the longitudinal axis L.

[0032] Therefore, as it has been observed, the tightening of the screw 16 allows to lock the position of the spotlight 1 in rotation and in pivoting. In other words, by tightening a unique screw 16 it is possible to lock the rotation of the spotlight 1 with respect to the longitudinal axis L and the pivot axis P.

[0033] That means that, when the lighting device of the present invention is installed, the user can orientate the spotlight 1 with their hands, without needing the use of tools, and once obtained the desired orientation, he/she has just to tight the screw 16 in order to fix the position of the spotlight 1.

[0034] In this way, the lighting device of the present invention allows to quickly and easily modify and lock the orientation of the spotlight 1, and the configuration of said lighting device is simple and does not involves the incorporation of a considerable number of elements or actuation mechanisms.

[0035] Likewise, since the two locking pieces 11, 12 are arranged surrounding the protrusion 10 of the leg 9 of the spotlight 1 they can exert mutually opposed pressure forces against said protrusion 10. This allows to exert a retaining force directly on the pivot axis P of the spotlight 1 and to absolutely lock its tilting movement.

(1) with respect to a second axis (L), locking means of said rotating means of the spotlight (1) with respect to a first pivot axis (P) and locking means of said rotating means of the spotlight (1) with respect to a second axis (L), **characterized in that** it comprises a single actuation element (16) for all the locking means and **in that** the locking means of the rotating means of the spotlight (1) with respect to a first pivot axis (P) operate directly on said pivot axis (P).

2. Lighting device, according to claim 1, **characterized in that** the actuation element comprises a screw (16).
3. Lighting device, according to any of the previous claims, **characterized in that** the locking means of the rotating means of the spotlight (1) with respect to a first pivot axis (P) comprise a first piece (11) that presses a part (10) of said pivot axis (P), thus avoiding the rotation of the spotlight (1) with respect to the pivot axis (P).
4. Lighting device, according to any of the previous claims, **characterized in that** the locking means of the rotating means of the spotlight (1) with respect to a second axis (L) comprise a second piece (12) that presses a part (5) of the support (3), thus avoiding the rotation of the spotlight (1) with respect to said second axis (L).
5. Lighting device, according to claims 3 and 4, **characterized in that** the screw (16) is linked to the spotlight (1), to the first piece (11) and to the second piece (12), so that when the screw (16) is tightened the first piece (11) presses a part (10) of the pivot axis (P) of the spotlight (1) against the second piece (12), thus locking the rotation of the spotlight (1) with respect to said pivot axis (P), and the second piece (12) presses a part (5) of the support (3) thus locking the rotation of the spotlight (1) with respect to the second axis (L).

Claims

1. Lighting device comprising a spotlight (1), a support (3), rotate means of the spotlight (1) with respect to a first pivot axis (P), rotating means of the spotlight

Fig.1

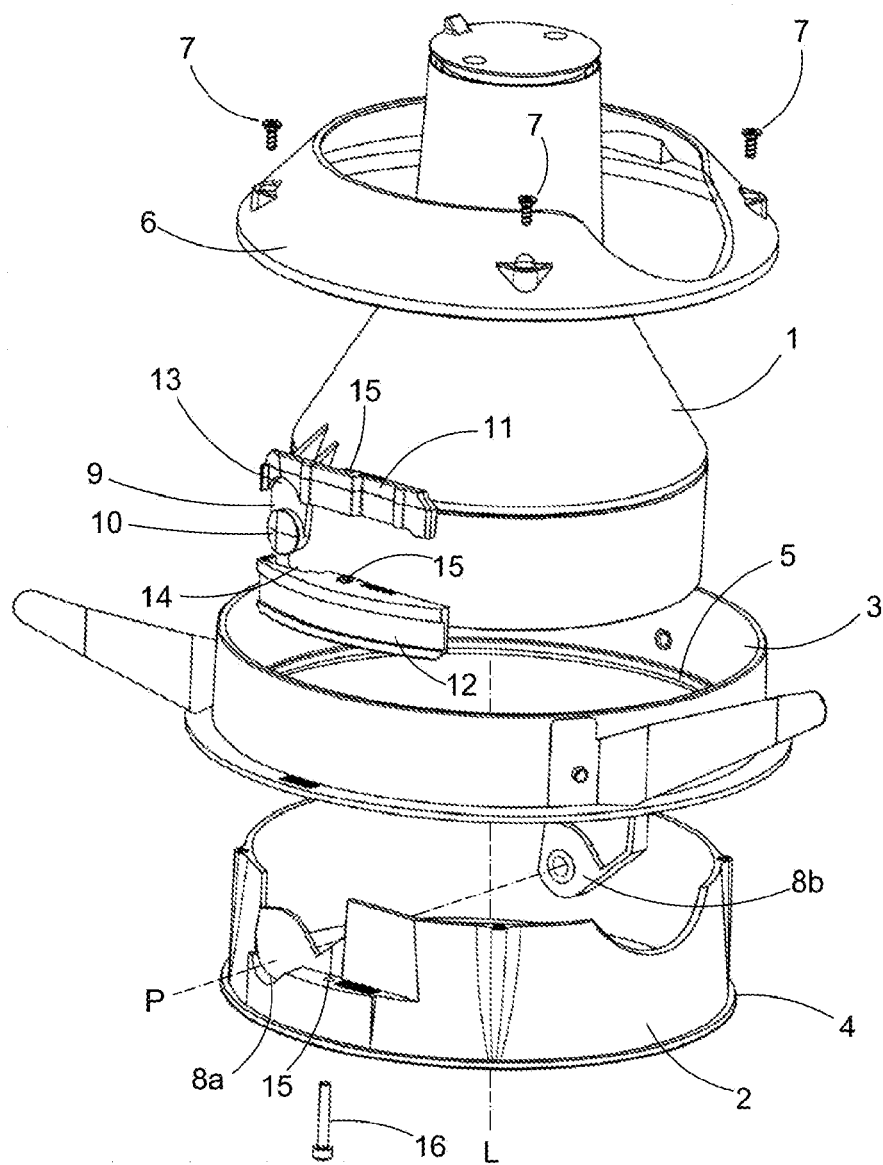


Fig.2

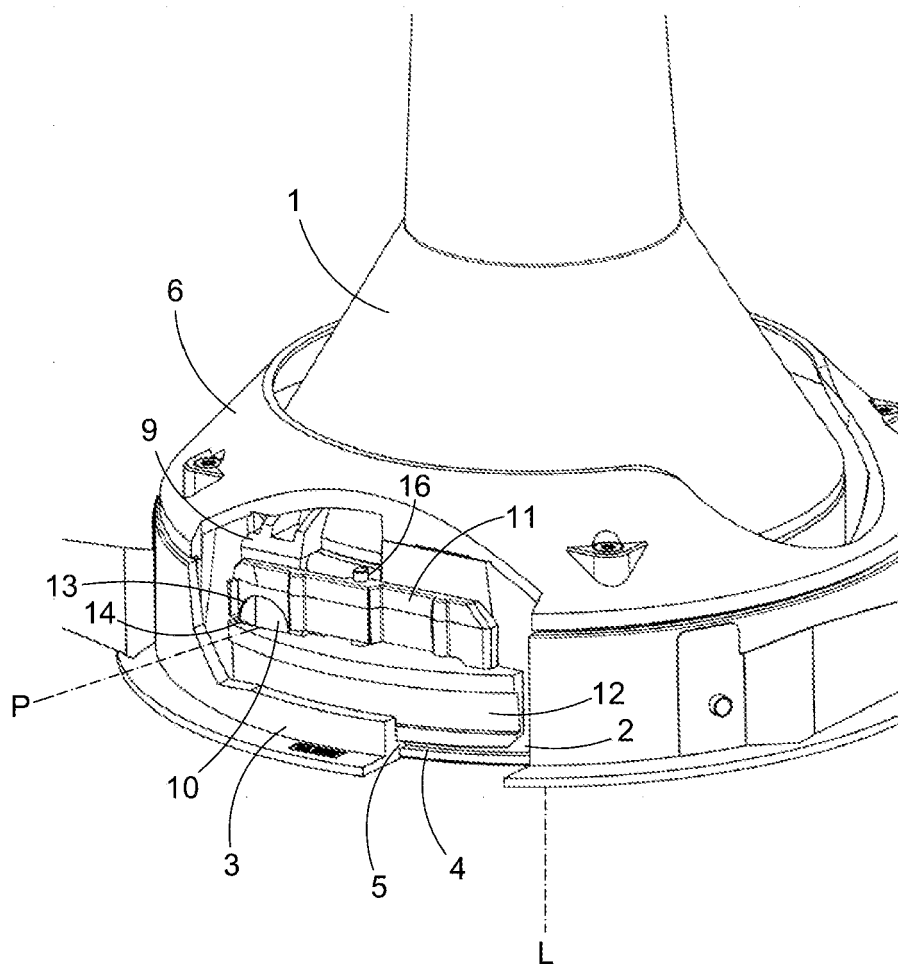


Fig.3

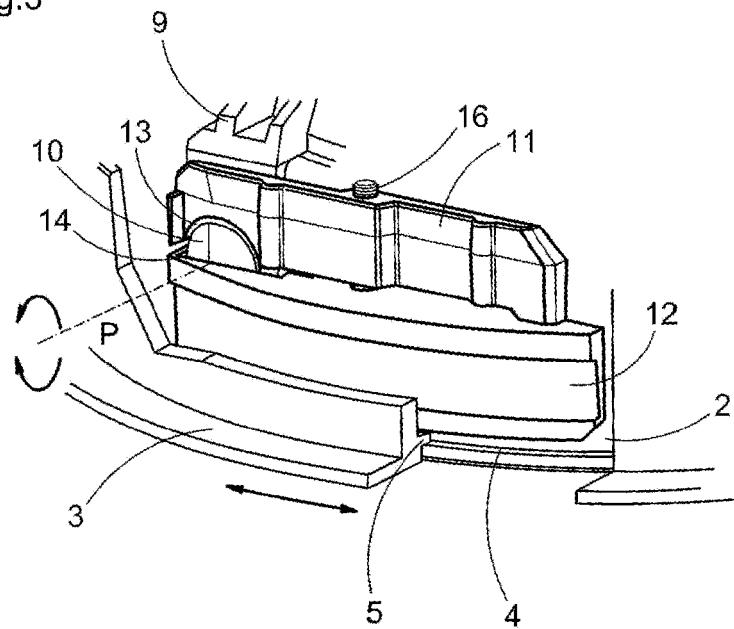
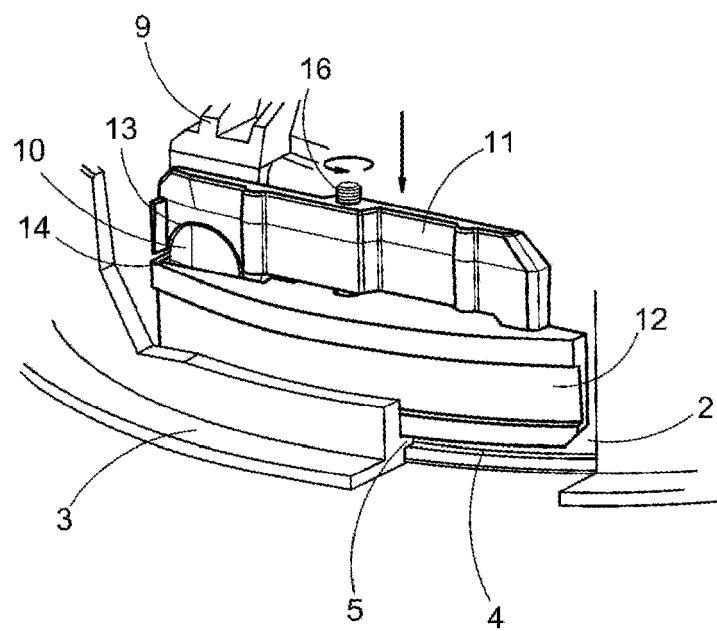


Fig.4





EUROPEAN SEARCH REPORT

Application Number
EP 09 17 3750

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/027900 A1 (JANOS JOSEPH JOHN [US] ET AL) 29 January 2009 (2009-01-29) * paragraph [0041] * * paragraph [0071] * * figure 15 *	1-3	INV. F21S8/02 F21V21/30
A	US 6 402 112 B1 (THOMAS ERIC P [US] ET AL) 11 June 2002 (2002-06-11) * abstract * * column 1, line 6 - line 10 * * column 3, line 33 - line 36 * * column 3, line 43 - line 57 * * column 3, line 66 - line 21 * * column 5, line 3 - line 21 * * figures 1-5 *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21S F21V
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 March 2010	Examiner Schulz, Andreas
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			

4

EPO FORM 1503 03.82 (P04C01)

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

EP 09 17 3750

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-03-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009027900 A1	29-01-2009	NONE	
US 6402112 B1	11-06-2002	CA 2342312 A1	30-12-2001

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1923623 A [0004]