

Description

[0001] The present invention relates to an improved lampholder for a vehicle headlight, of the type in which a collar, normally coaxial with an optical axis of the headlight reflector, houses, inside a seat in the reflector, a light source (e.g. a lamp) having a flange-shaped mounting base.

[0002] A lampholder of the above type is known, for example, from patent documents FR-A-2726631 and US-A-4872096, in which the lamp or other light source is retained in the desired position, with the base resting against an inner shoulder of the collar, by retaining means comprising a fork- or frame-shaped spring; the spring is hinged at a first end to the collar or to a portion of the headlight casing or body close to the collar and housing the reflector; and a second end of the spring, opposite the first, releasably engages, e.g. by means of a click-on coupling, a retainer (tooth or seat) on the collar or headlight casing or body. To release the lamp or light source, e.g. to change it when necessary, the spring must therefore be released and rotated clear of the lamp or other light source seat, so as to extract the lamp or other light source from the seat in the reflector and from the lampholder collar to make the replacement, which is normally done working through the lampholder access opening formed in the headlight casing or body and normally fitted with a removable cover.

[0003] In the past, lampholders of the above type have proved satisfactory on the whole. In currently marketed vehicles, however, the space available in the engine compartment is increasingly limited, due to the installation of more powerful engines and numerous other devices and accessories. As a result, less space is also available between the lampholder collar and/or the opening in the headlight body and the engine or other devices close to the headlights inside the engine compartment, thus making it difficult to reach inside the headlight to remove and replace the lamp.

[0004] Another point to bear in mind is that when releasing the spring and rotating the hinged end, the spring projects inwards of the engine compartment, thus further reducing the space available.

[0005] Attachment and release of the spring to and from the retainer are therefore awkward jobs which must very often be performed blind; another point to bear in mind is the effort required of the user to attach and release an elastic retaining member such as said fork- or frame-shaped spring.

[0006] In document FR-A-2732749, this problem is solved using a lamp or light source in which the base performs both a positioning and retaining function, by comprising bayonet means cooperating with similar retaining means on the lampholder. This solution, however, greatly increases the cost of both the lamp or other light source and the lampholder itself; and, given the confined space in which to work, it is not always easy to rotate the base to insert or release the bayonet retaining means.

[0007] It is an object of the present invention to eliminate the aforementioned drawbacks by providing a lampholder for a vehicle headlight, of the type employing a light source with a flange-shaped mounting base, and which, at the same time, provides for low-cost production and assembly of both the lampholder itself and the light source, e.g. incandescent, halogen, or discharge lamp, is extremely easy to manoeuvre in confined spaces, and is compact and highly reliable.

[0008] According to the present invention, there is provided a lampholder for a vehicle headlight, comprising a collar which receives a light source having a flange-shaped mounting base, and is connectable functionally to a reflector housed functionally inside a casing closed at the front by a transparent shield or lens extending across the optical axis, as claimed in Claim 1.

[0009] More specifically, the collar comprises stop means for axially arresting the base of the lamp towards the reflector, and is associated functionally with elastic retaining means for maintaining the base in contact with the stop means. According to one aspect of the invention, the elastic retaining means are defined by at least one member entirely movable with respect to the collar so as to slide at all times in a direction crosswise to the axis of the lamp.

[0010] The lampholder also comprises constraint means for said movable member, which are functionally integral with the collar to selectively allow the movable member to slide between a first and a second limit position. The movable member is defined by a fork-shaped spring made of bent metal wire and having a first end defined by two prongs fitted to slide transversely, with respect to the axis of the lamp, inside a seat in the collar aligned with a corresponding seat in the reflector for the light source; and a second end defined by a loop formed by a crosspiece which connects the prongs and is parallel thereto.

[0011] The constraint means comprise a screw or equivalent member fitted, parallel to the axis of the lamp, to a support integral with, and possibly forming part of, the collar; the shank of the screw engages the loop on the crosspiece, and the head of the screw defines an axial shoulder parallel to and opposite that defined by said stop means on the collar.

[0012] Guide means for guiding the movable member are also provided, and are defined by a slide surface on which at least part of the loop on the crosspiece is guided by the constraint means along a trajectory which may be curved or oblique but at any rate crosswise to the axis of the lamp.

[0013] As a result, the form of the collar, on the one hand, and of the elastic retaining means (the spring), on the other, is simplified, and the size of both is reduced by eliminating the hinges by which to rotate the spring, and the retainers for locking the spring, all of which are replaced by a straightforward screw.

[0014] But the main advantage of the invention lies in greatly simplifying locking and release of the light source

without recourse to much more expensive bayonet retaining systems. The loop of the retaining spring, in fact, is simply slid along the screw shank so that the prongs either release or engage the base, to grip the base against the stop means on the collar, which may be the same as those used in rotating springs, or to leave the base free to translate inside the seat in the collar to slide the light source axially from the seat in the reflector. The size of the lampholder, both when stationary and in use, is drastically reduced, and all by means of a straightforward, low-cost solution which, above all, is much more reliable than those based on the use of rotating springs.

[0015] Two non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a three-quarter rear view in perspective of a lampholder in accordance with the teachings of the invention;

Figure 2 shows a slightly larger-scale rear view of the Figure 1 lampholder;

Figure 3 shows a longitudinal section of a second embodiment of the lampholder according to the invention;

Figures 4 and 5 show a rear view of the Figure 3 lampholder in two different operating positions.

[0016] With reference to Figures 1, 2 and 3, number 1 indicates as a whole a lampholder for a headlight 2 (only the main parts of which are shown schematically by the dash line and partially for the sake of simplicity) of a vehicle (not shown).

[0017] Headlight 2 comprises a reflector 3 having a seat 4 for a lampholder 1 of a light source 5, and defining an axis A along which the light source is located.

[0018] In the example shown, light source 5 is an incandescent lamp, though, for the purpose of the invention, any other light source (e.g. halogen lamp, discharge lamp, LED, etc.) obviously also applies. Whichever is used, light source 5 (hereinafter also referred to as "lamp 5" for the sake of simplicity) must have a base 6 for positioning and locking lamp 5 (as described below). The base is preferably made of sheet metal in one piece with the body of lamp 5, which has rear electric connectors 5a, 5b; and base 6, in the example described, is flange-shaped, and has a radial appendix 6a for also ensuring correct radial positioning of lamp 5.

[0019] Reflector 3 is housed functionally - in fixed or rocking manner, depending on the headlight model - inside a cup-shaped body or casing 7 normally made of molded polymer material and which, being known, is only shown partly by a dash line. Cup-shaped body or casing 7 is closed at the front by a transparent shield or lens 9 facing and protecting reflector 3. Lampholder 1 comprises a collar 10 having a seat 11 for receiving light source 5; which seat is aligned with seat 4 of reflector 3, is therefore parallel to optical axis A, and is substantially cylindrically symmetrical. More specifically, seat 11 is shaped

so that base 6 slides in, translating parallel to axis A, and has a groove 12 for housing appendix 6a and the lateral walls of which cooperate with appendix 6a, in use, to impose a predetermined angular position of lamp 5 and prevent lamp 5 from rotating inside seats 4, 11.

[0020] Collar 10 is connected functionally to reflector 3, e.g. may be integral with reflector 3 in the case of a rocking reflector, or is fitted integrally to or formed in one piece with body or casing 7. Whichever the case, seat 11 is accessible from outside body or casing 7 through an opening 13 closed, in use, by a known removable cover not shown.

[0021] Collar 10 comprises stop means 20 for arresting base 6 axially (with reference to axis A) towards reflector 3, and which are defined, for example, by a rear face surface 21 of a continuous or discontinuous, radially inner annular collar or projection of seat 11. Surface 21 faces away from reflector 3, towards opening 13, so as to define an axial stop when inserting lamp 5 inside seat 11.

[0022] Collar 10 is also associated functionally with elastic retaining means 25 for maintaining base 6 in contact with stop means 20, so as to establish a predetermined position of light source 5 with respect to the focus F of reflector 3 to achieve a desired light distribution.

[0023] According to a main aspect of the invention, elastic retaining means 25 are defined by at least one (in the non-limiting embodiment shown, by one) sliding member 26, which is entirely movable with respect to collar 10, so as to slide at all times in a direction crosswise to optical axis A.

[0024] Sliding member 26 has constraint means 27 functionally integral with collar 10, and which selectively allow member 26 to slide, in said direction crosswise to the optical axis, between a first and second limit position.

[0025] In the first limit position, shown by the dash line in Figure 2, a first end 28 of sliding member 26 projects inside seat 11 of collar 10 to engage base 6; and, in the second limit position, shown by the continuous line in Figure 2, at least part of end 28 of sliding member 26 is located laterally outwards of seat 11 of collar 10, clear of base 6 and preferably also of stop means 20, and in a plane perpendicular to axis A and parallel to the Figure 2 plane.

[0026] Sliding member 26 is defined by a fork-shaped spring made of bent metal wire, and said first end 28 of member or spring 26 is defined by two prongs 29 fitted, to slide radially with respect to optical axis A inside seat 11 of collar 10, through two lateral openings 30 in collar 10.

[0027] A second end 31, engaging constraint means 27, of sliding member 26 is defined by a loop 32 of a crosspiece 33 of sliding member or spring 26. More specifically, crosspiece 33 connects the bases of prongs 29, which project from crosspiece 33, parallel to axis A; and loop 32 also projects from crosspiece 33, parallel to and on the opposite side to prongs 29, and has one end, opposite crosspiece 33, bent outwards of the plane of crosspiece 33 to define a grip 35 by which to manoeuvre

sliding member or spring 26 manually or automatically as will be seen.

[0028] Constraint means 27 preferably comprise a straightforward screw (or equivalent, e.g. a headed pin) fitted, parallel to axis A, to a support 38, which is either integral with and possibly forming part of collar 10, or is secured close to collar 10, e.g. integral with body or casing 7 if possible. Screw 27 comprises a shank 40 fitted through loop 32 of crosspiece 33 of spring 26; and a head 41 defining an axial shoulder parallel to and opposite that defined by surface 21 of stop means 20 of collar 10. In a plane perpendicular to axis A - in the example shown, in the Figure 2 plane - loop 32 tapers towards prongs 29, so as to click from the first to the second limit position (and/or vice versa).

[0029] Prongs 29 are preferably defined by straight portions of metal wire bent into a V outside the plane of crosspiece 33, so as to flex elastically in controlled manner in planes parallel to axis A and exert a relatively strong elastic reaction force.

[0030] According to a further aspect of the invention, lampholder 1 also comprises guide means 50 for guiding the fully movable sliding member defined by fork-shaped spring 26. Guide means 50 engage and cooperate in sliding manner with second end 31 of sliding member or spring 26 - in the example shown, cooperate with and rest on loop 32.

[0031] Guide means 50 are defined by a flat surface 51 (Figure 2), on which loop 32 slides, and onto which at least part of loop 32 is pushed by constraint means 27.

[0032] Figures 3 to 5 show a possible variation 100 of lampholder 1 in Figures 1 and 2, in which any details similar or identical to those already described are indicated for the sake of simplicity using the same reference numbers.

[0033] The only differences with respect to lampholder 1 lie in a simplified version of fully movable sliding member or spring 26, which comprises prongs 29 directly engaging the constraint means defined by screw 27, and a corresponding slide surface 151 of guide means 50 underneath; and slide surface 151, as opposed to being a flat surface perpendicular to optical axis A, like surface 51, is shaped differently and defines a trajectory crosswise and sloping with respect to axis A - more specifically, a curved trajectory crosswise to axis A, with its convexity facing away from reflector 3.

[0034] Prongs 29 of spring 26 are connected by a crosspiece 33, from which a loop 132 extends on the opposite side to the prongs, is bent at a right angle to crosspiece 33, and exclusively defines a grip 35 which, in the first limit position (shown by the continuous line in Figure 3), rests on head 41 of screw 27.

[0035] Lamp 5 is also a different model, with one connector 5b; and an oblique side 60 on base 6 is substituted for appendix 6a.

[0036] In both the embodiments described, prongs 29 clamp lamp 5 in use by means of base 6, which is gripped against the relative supports formed on surface 21, in the

same way as rotating-spring lampholders.

[0037] To remove and change lamp 5, e.g. in the event of a malfunction, the user, working through opening 13 in casing 7, simply presses (or pulls, depending on the position of lampholder 1 or 100) grip 35 manually to elastically deform prongs 29 and/or the tapered lateral branches of loop 32 (Figure 1 and 2 embodiment) to slide the whole of spring 26 along surface 51 (or 151) and on constraint means 27 into the second limit position, clear of base 6, and with most of prongs 29 outside seat 11.

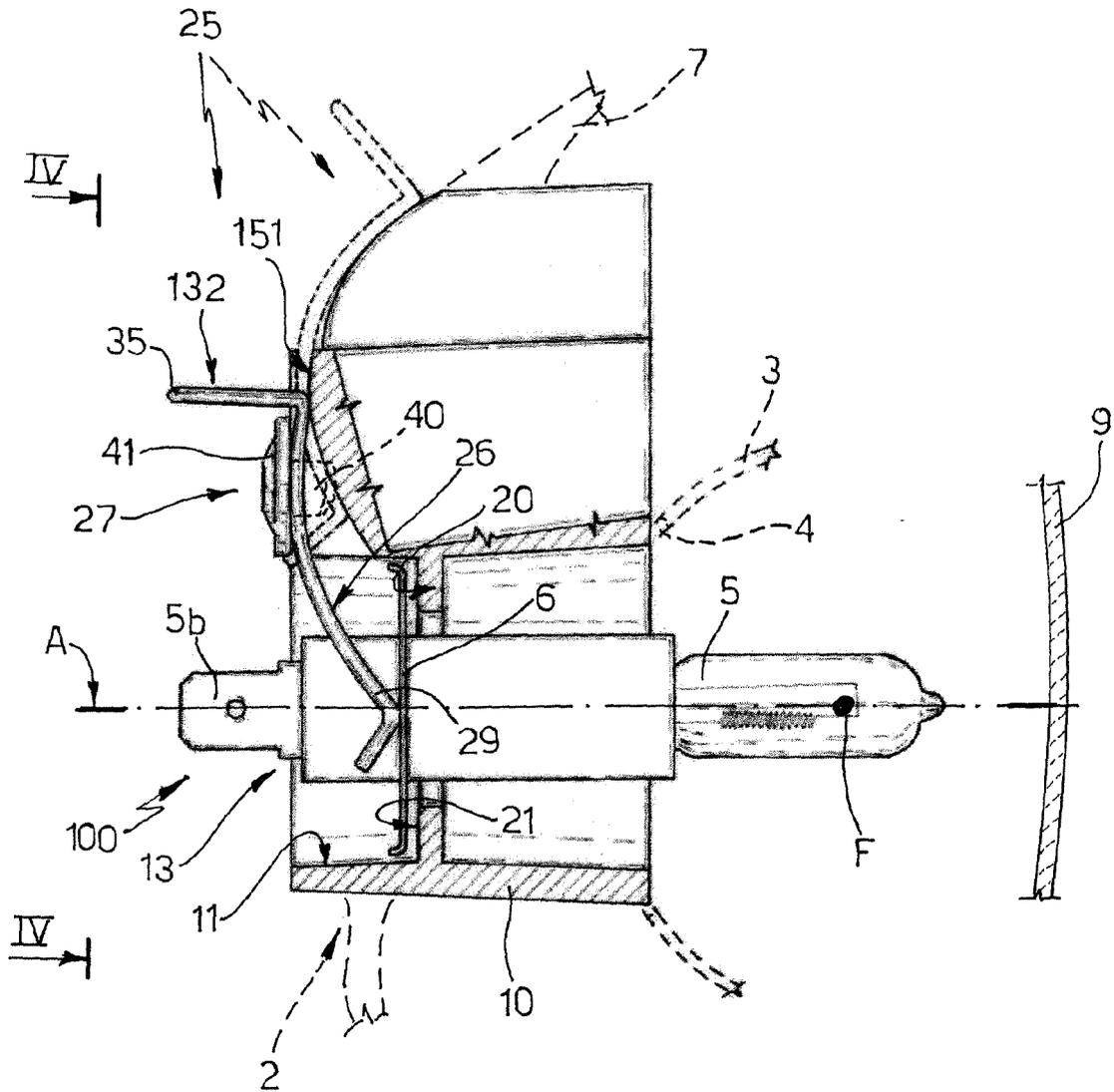
[0038] In one simple movement, and with no increase in the axial size of the lampholder, base 6 can therefore be released to extract the faulty light source 5 manually from seat 11 by sliding it parallel to axis A, and to replace it with a new light source by simply performing the same movements in reverse. Support 38 may be fitted with an actuator controlled electrically to act on grip 35 - especially if this is hard to reach - to move spring 26 automatically between the first and second limit position.

Claims

1. A lampholder (1; 100) for a vehicle headlight, of the type comprising a collar (10) for receiving a light source (5) having a flange-shaped base (6); the collar can be fitted functionally to a reflector (3) in turn housed functionally inside a casing (7) closed at the front by a transparent shield or lens (9); said collar comprising stop means (20) for axially arresting said base towards said reflector, and being functionally associated with elastic retaining means (25) for maintaining said base in contact with said stop means (20) to establish a predetermined position of said light source (5) with respect to the focus of the reflector to achieve a desired light distribution; **characterized in that** said elastic retaining means (25) are defined by at least one sliding member (26) fully movable with respect to the collar (10) so as to slide at all times in a direction crosswise to said optical axis (A).
2. A lampholder (1; 100) as claimed in Claim 1, **characterized in that** said sliding member (26) fully movable with respect to the collar (10) has constraint means (27) functionally integral with the collar (10), and which selectively allow the sliding member to slide, in said direction crosswise to the optical axis (A), between a first and a second limit position; in said first limit position, a first end (28) of said sliding member (26) projecting inside a seat (11) in the collar (10) to engage said base (6), which seat in the collar and a corresponding seat (4) in the reflector (3) are aligned and house, in use, said light source (5); and, in said second limit position, at least part of said first end (28) of the sliding member (26) being located laterally outwards of said seat (11) for the light source in the collar, being located clear of said base (6) and

preferably of the stop means (20), and lying in a plane perpendicular to the optical axis (A).

3. A lampholder (1; 100) as claimed in Claim 2, **characterized in that** said sliding member is defined by a fork-shaped spring (26) made of bent metal wire; said first end of the sliding member being defined by two prongs (29) fitted, to slide radially with respect to the optical axis (A) inside the seat (11) for said light source in the collar, through two lateral openings (30) in the collar. 5 10
4. A lampholder (1) as claimed in Claim 3, **characterized in that** a second end (31), engaging said constraint means (27), of the sliding member is defined by a transverse loop (32) of a crosspiece (33) forming part of said spring of bent metal wire and connecting the prongs (29); said loop (32) extending parallel to and on the opposite side to said prongs, and defining, at one end opposite the prongs and bent outwards of the plane of the crosspiece, a grip (35) by which to manoeuvre the sliding member manually or automatically. 15 20
5. A lampholder (1; 100) as claimed in Claim 4, **characterized in that** said constraint means comprise a screw (27) or equivalent member fitted to a support (38) integral with and possibly forming part of the collar; the screw having a shank (40) fitted through the spring (26) of bent metal wire, and a head (41) defining an axial shoulder parallel to and opposite that defined by said stop means (20) of the collar. 25 30
6. A lampholder (1) as claimed in Claim 4 or 5, **characterized in that**, in a plane perpendicular to said optical axis (A), said loop (32) tapers towards said prongs (29), so as to click from the first to the second limit position and/or vice versa. 35
7. A lampholder (1; 100) as claimed in one of Claims 4 to 6, **characterized in that** said prongs (29) are bent into a V outside the plane of the crosspiece (33). 40
8. A lampholder (1; 100) as claimed in one of Claims 4 to 7, **characterized by** comprising guide means (50) for guiding said sliding member (26); which guide means engage and cooperate in sliding manner with said second end (31) of the sliding member. 45
9. A lampholder (1) as claimed in Claim 8, **characterized in that** said guide means are defined by a slide surface, onto which said constraint means (27) guide at least part of said loop (32) of the crosspiece of the spring of bent metal wire defining said sliding member (26). 50 55
10. A lampholder (100) as claimed in Claim 8, **characterized in that** said guide means are defined by a
- slide surface (51) defining a trajectory crosswise to and sloping with respect to the optical axis (A).
11. A lampholder (100) as claimed in Claim 10, **characterized in that** said slide surface (51) defines a curved trajectory crosswise to the optical axis (A) and whose convexity may face towards or away from the reflector (3).



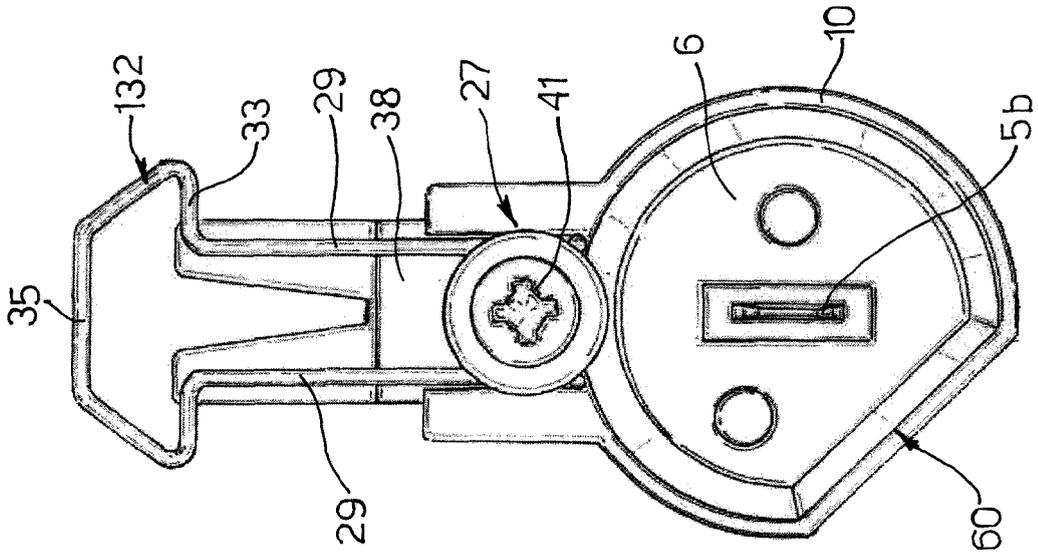


Fig 5

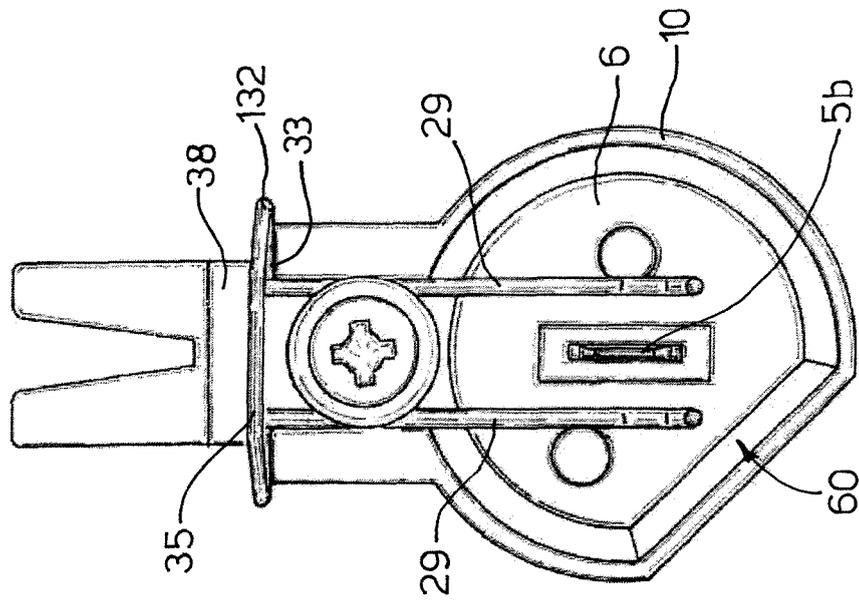


Fig 4



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 4 774 645 A (IWAMOTO MIYOSHI [JP]) 27 September 1988 (1988-09-27) * column 4, line 5 - line 46 * * column 5, line 21 - line 40 * * column 6, line 47 - line 59 *	1	INV. F21V19/00
A	* figures 9-13 * -----	2,3	ADD. F21W101/10
X	US 6 923 555 B2 (BYGGMASTAR KLAS [FI]) BYGGMAESTAR KLAS [FI] 2 August 2005 (2005-08-02) * abstract; figures 1-3 *	1	
X	FR 2 284 821 A1 (AUTEROUCHE [FR]) 9 April 1976 (1976-04-09) * figures 1,2 * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21V
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		15 February 2007	Allen, Katie
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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EPO FORM 1503 03.82 (P/4C01)

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

EP 06 12 6237

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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15-02-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4774645	A	27-09-1988	NONE	

US 6923555	B2	02-08-2005	AT 344908 T	15-11-2006
			EP 1302721 A2	16-04-2003
			FI 20011971 A	11-04-2003
			US 2003067788 A1	10-04-2003

FR 2284821	A1	09-04-1976	ES 208320 Y	01-08-1976

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- FR 2726631 A [0002]
- US 4872096 A [0002]
- FR 2732749 A [0006]