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(71) Applicant: **CARELLO S.p.A.**
Corso Unione Sovietica, 600
I-10135 Torino(IT)

(72) Inventor: **Toso, Roberto**
Via Raffaello Sanzio, 8/A
I-10040 Druento(IT)

(74) Representative: **Jorio, Paolo et al**
Studio Torta, Via Viotti, 9
I-10121 Torino(IT)

(54) Vehicle headlamp.

(57) Vehicle headlamp (1) in which a reflector (2) of stamped plastic material is provided with a seat (9) engaged by a lamp (3) which is axially locked by a bistable elastic member (14) which is snap-locked on the reflector (2) and is adapted to be switched between a configuration in which the lamp (3) is locked on the relative seat (9) and a configuration for assembly in which the lamp (3) can be inserted into and disengaged from the seat (9).

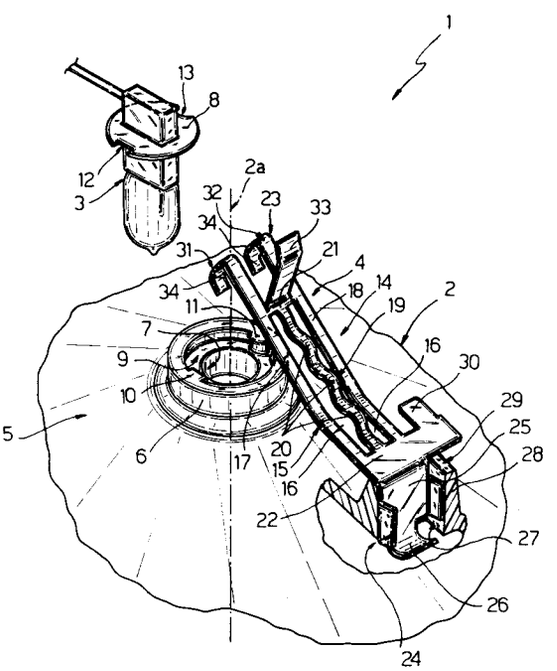

Fig.1

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The present invention relates to a vehicle headlamp.

The present invention relates in particular to a headlamp of the type comprising a reflector of stamped or die-cast plastic material provided with an axial rear opening engaged by a lamp which is kept connected to the reflector by a locking device which can be released.

The locking devices known up to now used to lock the lamp on such a reflector normally comprise an outer metal ring mounted on the end of the reflector and forming a bearing seat for an intermediate flange of the lamp. These known locking devices normally comprise two axial projections, which extend rearwards from diametrically opposite points of the metal ring, one of which forms a hinge connection for a respective end of a leaf spring and the other forms a hook for the other end of the leaf spring when the leaf spring itself is disposed in a locking position, in which an intermediate curved portion of the spring presses elastically on the intermediate flange of the lamp, maintaining the lamp in contact with its seat.

These known locking devices described above have certain drawbacks of an economic nature resulting chiefly from the use of the metal ring for supporting and hooking the leaf spring, whose manufacturing and assembly costs are fairly high and have a substantial impact on the total production cost of the headlamps.

The object of the present invention is to provide a vehicle headlamp which is free from the above drawbacks.

In accordance with the present invention, a vehicle headlamp is provided comprising a reflector of plastic material provided with an axial rear aperture, a lamp mounted through this rear aperture and having an intermediate flange so that it can be supported on the reflector and a locking device which can be released for holding the lamp in connection with the reflector, characterized in that the reflector comprises, in one piece, a seat surrounding the aperture and acting as a support for the intermediate flange and in that the locking device comprises a bistable elastic member and snap-locking means for connecting the bistable elastic member to the reflector, the bistable elastic member being adapted to be switched between a configuration locking the lamp on the seat and an assembly configuration in which the lamp can be inserted into and disengaged from the seat.

The invention is now described with reference to the accompanying drawings, which show a non-limiting embodiment thereof and in which:

Fig. 1 is a partial exploded perspective view, with some parts removed for clarity, of a preferred embodiment of a vehicle headlamp of the present invention;

Figs. 2 and 3 are axial sections through the headlamp of Fig. 1 in two different operating positions;

Fig. 4 is a rear view of the headlamp in the operating position of Fig. 3.

In Fig. 1, a vehicle headlamp is shown overall by 1 and comprises a reflector 2 formed from stamped or die-cast plastic material and having an optical axis 2a, a lamp 3 and a locking device 4 for locking the lamp 3 on the reflector 2.

The reflector 2 has an outer surface 5 from which there projects rearwards a cylindrical projection 6 coaxial with the axis 2a and having a through bore 7 engaged by the lamp 3, an intermediate flange 8 of which engages with an axial seat 9 provided on the free end of the projection 6 about the bore 7 and is disposed in contact with a base surface of the seat 9.

Projections 10 and 11 disposed at diametrically opposite points of the seat 9 engage respective recesses 12 and 13 provided on the periphery of the flange 8 to lock the lamp 3 angularly with respect to the reflector 2 within the seat 9.

With reference to Fig. 1, the locking device 4 comprises a bistable elastic member 14, an intermediate portion of which is formed by a flat elastic blade 15 of substantially rectangular shape which has two longitudinal slots 16 disposed symmetrically with respect to a longitudinal axis of the blade 15. The length of the slots 16 is less than the length of the blade 15 and the slots provide on the blade 15 two bars 17 and 18 disposed on opposite sides of a central elastic member 19 which is formed by a bar similar to the bars 17 and 18 but having transverse corrugations 20 which reduce the distance between its opposite ends to a value slightly lower than the distance between the corresponding opposite ends of the bars 17 and 18. The corresponding ends of the bars 17 and 18 and of the elastic member 19 are rigidly connected by two end crossbars 21 and 22, the first of which is rigid with a pressure member 23 adapted to cooperate with the flange 8 so as to hold this flange 8 in contact with the base surface of the relative seat 9 and the second of which is rigid with a member 24 for connecting the bistable elastic member 14 to the reflector 2.

As shown in detail in Fig. 1, the connection member 24 comprises an arm 25 extending in a direction substantially perpendicular to the blade 15 and having, in cross-section, substantially the shape of a C. An end section of the arm 25 is folded into a U shape so as to form an elastic hook 26 adapted to allow the snap-locking of the arm 25 within a hole 27 provided axially along a projection 28 projecting rearwards from the outer surface 5 of the reflector 2 and provided in one piece by stamping with the reflector 2.

As shown in detail in Figs. 2 and 3, the projection 28 is disposed on the reflector 2 laterally to the projection 6 and at a distance from the optical axis 2a substantially equal to the total length of the blade 15 and the pressure member 23. When the arm 25 is snap-locked through the hole 27, an end surface 29 of the projection 28 forms a bearing surface for the crossbar 22 one end of which has connected to it an end blade 30 for the connection to the elastic member 14 of an earth wire (not shown).

The pressure member 23 extends from the crossbar 21 coaxially to the blade 15 and is subdivided, by axial notches, into three arms 31, 32 and 33, the first two of which, disposed on opposite sides of the arm 33, each have an end portion 34 folded into the shape of a C and adapted to come into contact with the rear surface of the flange 8, while the arm 33 is folded substantially at right angles with respect to the blade 15 and extends from the opposite side of the end portions 34 to form a lever for the actuation of the bistable elastic member 14.

In use, by applying an actuating force to the arm 33 in the clockwise or anti-clockwise direction in Figs. 2 and 3, it is possible to cause the blade 15 to assume, against the axial elastic force exerted by the recall member 19, a first bent assembly configuration (Fig. 2) in which the pressure member 23 is disposed remote from the seat 9 and allows the mounting of the lamp 3 on the reflector 2 or a second bent operating or locking configuration in which the pressure member 23 presses via the C-shaped ends 34 of its arms 31 and 32 on diametrically opposite points of the flange 8 so as to hold the flange 8 in contact with the base surface of the seat 9.

It can be seen from the above description that, given its configuration, the bistable elastic member 14 may be connected directly to the reflector 2 without the interposition of any metal connection member and that the seat 9 may be provided directly on the reflector 2 without the need for any metal insert.

It should also be noted that the bistable elastic member 14, as it is snap-locked to the reflector 2, may be readily replaced without needing any destructive action on the reflector 2.

Claims

1. A vehicle headlamp (1) comprising a reflector of plastic material provided with an axial rear aperture (7), a lamp (3) mounted through this rear aperture (7) and having an intermediate flange (8) so that it can be supported on the reflector (2) and a locking device (4) which can be released for holding the lamp (3) in connection with the reflector (2), characterized in that the reflector (2) comprises, in one piece, a seat (9) surrounding the aperture (7) and acting as a support for the intermediate flange (8) and in that the locking device (4) comprises a bistable elastic member (14) and snap-locking means (24, 28) for connecting the bistable elastic member (14) to the reflector (2), the bistable elastic member (14) being adapted to be switched between a configuration locking the lamp (3) on the seat (9) and an assembly configuration in which the lamp (3) can be inserted into and disengaged from the seat (3).

2. A headlamp as claimed in claim 1, characterized in that the bistable elastic member (14) comprises a rectangular blade (15) in turn comprising two lateral bars (17, 18), elastic recall means (19) disposed longitudinally and interposed between these bars (17,18) and two crossbars (21, 22) connecting between one another corresponding longitudinal ends of the bars (17, 18) and the elastic recall means (19).

3. A headlamp as claimed in claim 2, characterized in that the elastic recall means (19) comprise a transversely corrugated bar (19) having a total length substantially identical to that of the lateral bars (17, 18).

4. A headlamp as claimed in claim 2, characterized in that the bistable elastic member (14) comprises a pressure member (23) extending axially from one end of the blade (15), the pressure member (23) being formed by two first arms (31, 32) each having an end portion (34) folded substantially into the shape of a C which is disposed separate from the flange (8) when the bistable elastic member (14) is in its assembly configuration and disposed in pressure contact with the flange (8) when the bistable elastic member (14) is in its locking configuration.

5. A headlamp as claimed in the preceding claims, characterized in that the pressure member (23) comprises an actuation arm (33) extending substantially at right angles to the blade (15) and the first two arms (31, 32) and disposed in an intermediate position with respect to these first two arms (31, 32).

6. A headlamp as claimed in any one of claims 2 to 5, characterized in that the bistable elastic member (14) has in one piece an electrical terminal (30) for the supply of the lamp (3).

7. A headlamp as claimed in any one of claims 2

to 6, characterized in that the connection means (24, 28) comprise a connection member (24) rigid with one end of the blade (15), the reflector (2) having seat means (27, 28) snap-locked by the connection member (24).

8. A headlamp as claimed in claim 7, characterized in that the seat means (27, 28) comprise a projection (28) provided in one piece on the reflector and an axial bore (27) provided along the projection (28) and snap-locked by the connection member (24).

9. A headlamp as claimed in claim 8, characterized in that the connection member (24) comprises an arm (25) extending substantially at right angles to the blade (15) and having a curved end portion (26) which snap-locks with the axial bore (27).

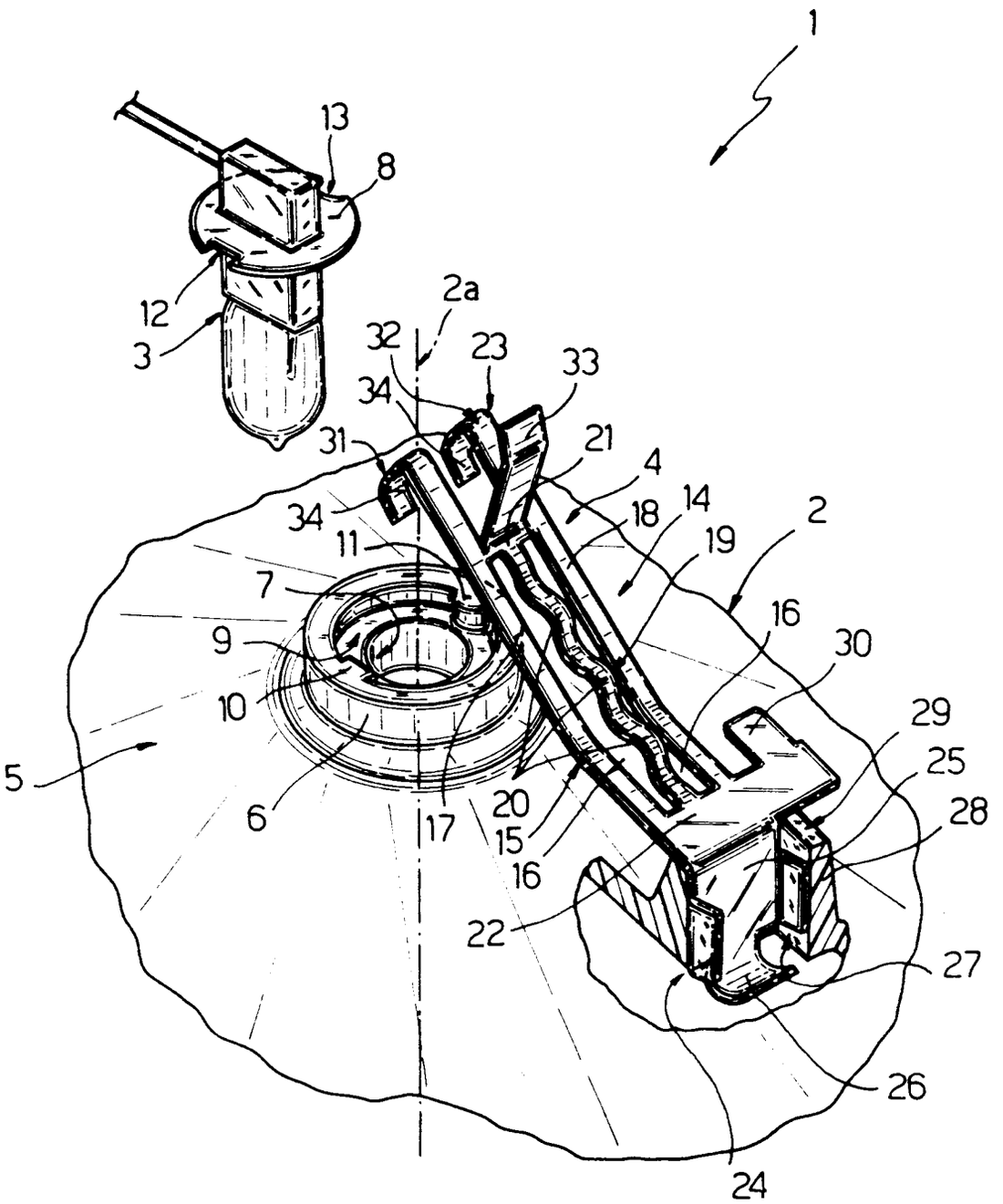
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Fig.1

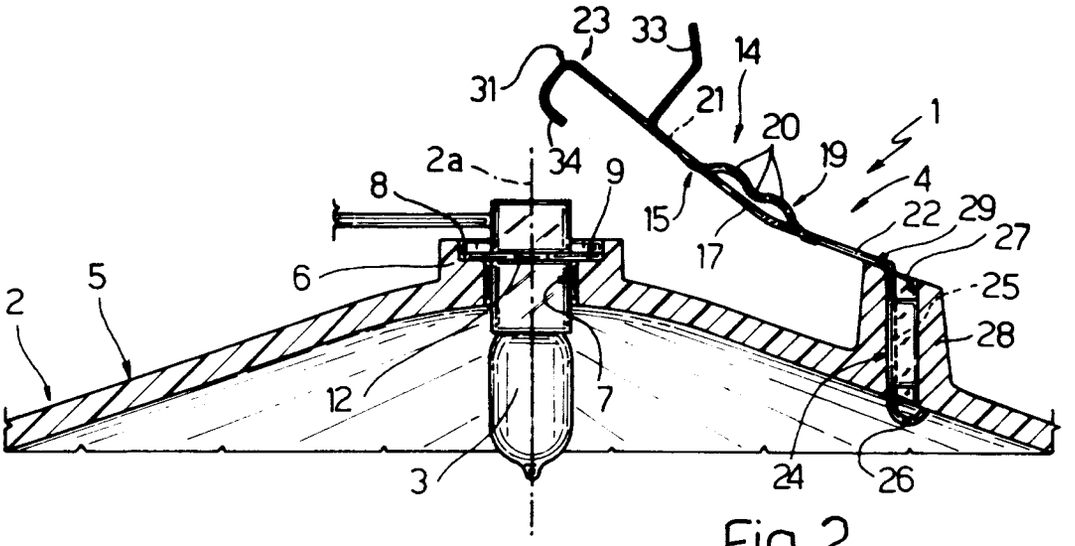

Fig. 2

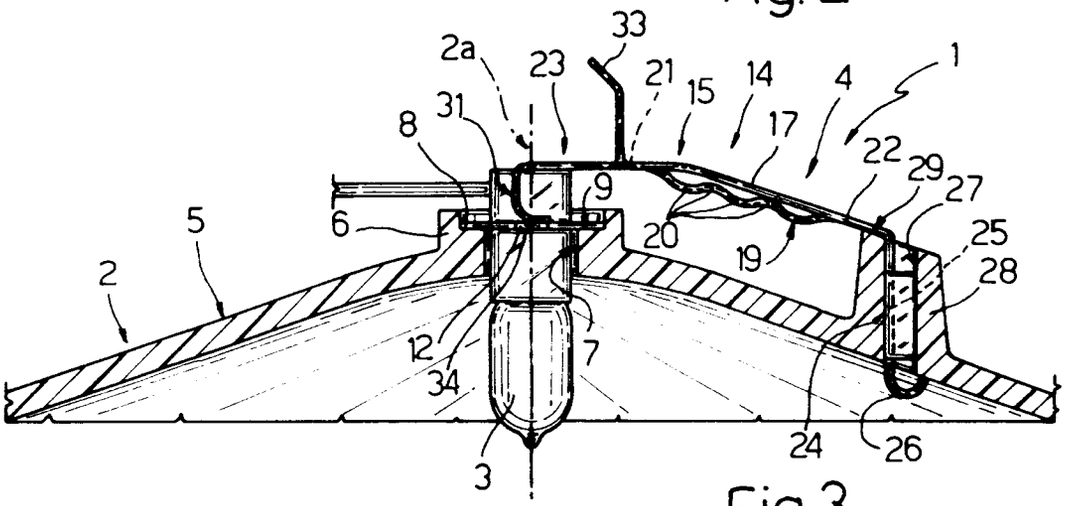

Fig.3

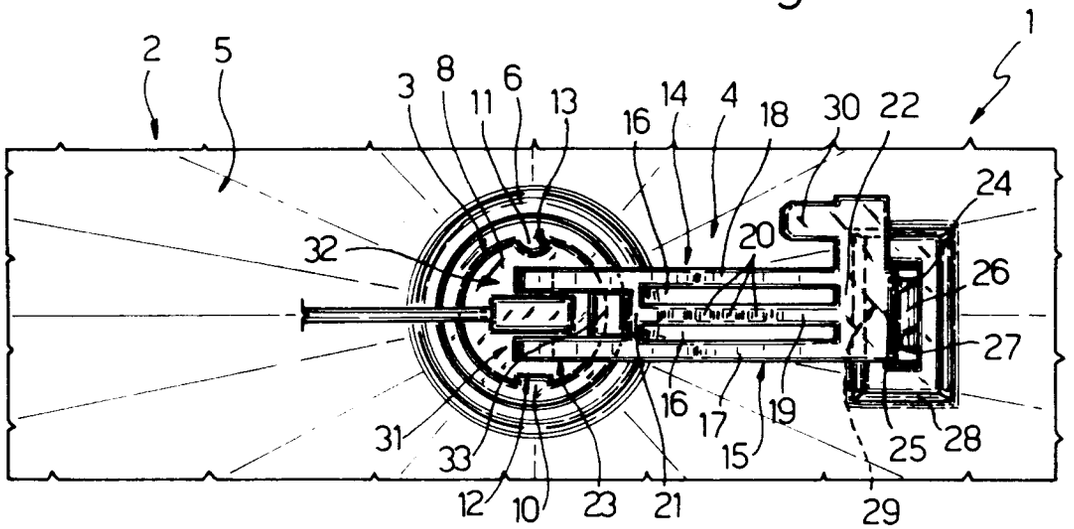

Fig.4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 10 7649

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-C-3 606 538 (HELLA KG & HUECK & CO) * column 6, line 39 - column 7, line 9 * * figure 1 *	1,6,7	F21M7/00
A	FR-A-2 638 128 (CIBIE PROJECTEURS) * page 2, line 3 - line 28; figure 5 *	1	
A	FR-A-2 639 090 (CIBIE PROJECTEURS) * page 3, line 26 - page 4, line 21 * * figures 1,2 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F21M
F21V
F21Q

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 AUGUST 1992	DE MAS A.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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