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(54) Lamp-holder for vehicle headlights.

(57) A lamp (5) for a vehicle headlight, comprising a bulb, a socket and a flange disposed between the bulb and the socket, and provided with axial centring pins, is carried by a device (12) in which a cup (13) which may be housed securely in a collar of a reflector of the headlight is joined by means of a bayonet connection (15) to a frame (14) which receives internally the socket of the lamp and has, on the side nearest the cup, a plate (20) through an aperture in which the lamp bulb is made to pass, a first face (26) of the plate, facing the cup, being completely flat; the frame carries an elastic fork-shaped element (16) which is hinged transversely to the socket and in one of whose operating positions the prongs (56) of the said element elastically secure the flange (8) of the lamp against a second face (27) of the plate, which is opposite the first, and is provided with recesses (28) to receive the axial pins of the flange.

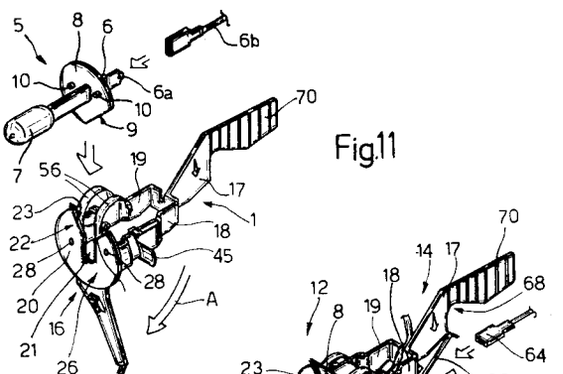

Fig.11

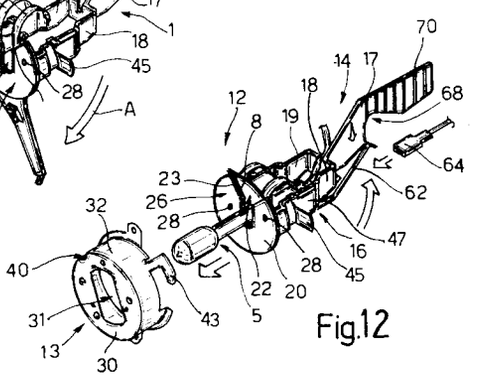

Fig.12

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The present invention relates to a lamp-holder for vehicle headlights.

In particular, the present invention relates to a lamp-holder capable of being fitted through a rear aperture in a reflector of a headlight to keep in position, on the said reflector, a conventional halogen lamp, in other words a lamp comprising a bulb, a socket and an intermediate flange interposed between them, of generally circular shape and provided with a lateral cut-out and axial centring pins, designed to be received in and bear on a supporting seat of the lamp-holder provided with reference holes for the centring pins.

Known lamp-holders of the type mentioned above have the disadvantage of generally having projections in the form of springs or of orientating teeth or pins, which form part of the lamp-holder or the lamp, and which easily catch, when replacing the lamp, on other projections of the headlight or of the lamp-holder elements designed to be fixed securely to the headlight reflector. This situation may cause incorrect positioning of the lamp and, ultimately, possible distortion of the projecting elements (which are usually formed from thin sheet) with consequent difficulties in the insertion and removal of the lamp.

The object of the invention is to provide a lamp-holder of the type described above, which is capable of facilitating the fitting of a corresponding lamp in its correct position, and, in particular, the replacement of the said lamp in cases where the headlight is disposed, as is frequently the case, in a position where access is difficult, while simultaneously reducing to a minimum the risks of catching on any projecting elements of the lamp-holder and/or of the lamp.

On the basis of the present invention, a lamp-holder for vehicle headlight lamps is produced, the lamp comprising a bulb, a socket and a flange disposed between the bulb and the socket and provided with axial centring pins, the lamp-holder being characterised in that it comprises a cup which may be housed securely in a collar of a reflector of the headlight and provided with a through aperture for the passage of the lamp bulb, a frame element supporting the lamp in such a way that it may be released, and a bayonet connection by means of which the frame element is inserted into and connected to the cup in such a way that it may be released; the frame element comprising a transverse plate which is disposed to face the cup and through an aperture in which the lamp bulb is made to pass, the said plate having a first face, which is completely flat and free of projections, facing the cup and capable of interacting with an end wall of the cup by bearing on it, and a second face, opposite the first, capable of receiving the flange of the lamp to bear on it and provided with recesses to receive the said axial centring pins of the flange; the lamp-holder further comprising an elastic pressure element to secure the flange of the lamp by pressure, in such a way that it may be released, against the second face of the plate.

To enable the invention to be more clearly understood, a non-restrictive description of a preferred embodiment of the invention will now be given, with reference to the figures of the attached drawings, of which

- Figure 1 is a lateral elevation and partial section of a reflector of a headlight provided with a lamp-holder produced according to the present invention;
- Figures 2, 3 and 4 are, respectively, a plan view and sections through the planes passing through III-III and IV-IV of a first component of the lamp-holder according to the invention;
- Figures 5 and 6 are a plan and elevation of a further component of the lamp-holder shown in Figure 1;
- Figures 7, 8 and 9,10 are, respectively, plans and sections through VII-VII and X-X of two further components of the lamp-holder shown in Figure 1;
- Figures 11 and 12 illustrate the operation of the lamp-holder shown in Figure 1; and
- Figures 13 and 14 show a detail of Figure 12 on an enlarged scale in two different operating positions.

With reference to Figure 1, 1 indicates a reflector of a headlight 1a (illustrated only in part, for simplicity's sake) of a vehicle, in particular of a motor vehicle which is not illustrated. The reflector 1 comprises a reflecting body 2 provided, at its rear end, with a collar 3 forming a passage 4 for a lamp 5.

With reference to Figure 11 also, the lamp 5 is a halogen lamp consisting of a socket 6, a bulb 7 and an intermediate flange 8 disposed between the bulb 7 and the socket 6; the flange 8 is of generally circular shape and is provided with a straight lateral cut-out 9 and two cylindrical axial centring pins 10 extending towards the bulb 7. A connector 6a carried by the socket 6 enables it to be connected electrically to a power supply cable 6b of the vehicle when in use (Figure 11).

The lamp 5 is connected to the collar 3 of the reflector 1 through a lamp-holder indicated as a whole by 12, comprising a cup 13 which may be joined securely to the collar 3, a frame element 14 supporting the lamp 5, a bayonet connection 15 by means of which the frame element 14 is joined to the cup 13 in such a way that it may be released, being inserted and connected inside the cup, and an elastic pressure element 16 carried by the frame element 14 to secure the lamp 5 against the frame element in such a way that it may be re-

leased.

The frame element 14 (Figures 2, 3 and 4) is preferably formed by pressing in one piece from a metal alloy and comprises a rectilinear grip bar 17, a pair of longitudinal arms or side members 18, 19 extending asymmetrically from the bar 17, and a transverse plate 20 which joins the side members 18, 19 together at their ends opposite the bar 17; the side members extend substantially parallel to the bar 17, but are shaped with a non-rectilinear form when seen from above (Figure 2), so that the distance between them at the position of the plate 20 is greater than in the proximity of the bar 17, where the side members 18, 19 are joined.

The plate 20 is disposed to face the cup 13 and is provided with an aperture 21 (Figure 4) through which the bulb 7 of the lamp 5 is made to pass when in use (Figure 12); the aperture 21, of generally rectangular shape, has, at its edge nearer the outside of the plate 20, a flared V-shaped portion 22 delimited by opposite radial oblique edges 23 and extending to form a gap which interrupts a perimetric edge 24 of the plate 20, substantially in a position opposite a prominence or projection 25 shaped so that it can interact with the cut-out 9 of the flange 8 of the lamp 5 by bearing on it, in a way which is known and which, for simplicity, is not illustrated.

According to the invention, the plate 20 has a first face 26 which faces the cup 13 and is completely flat and free of projections, and a second face 27, opposite the face 26, which is capable of receiving the flange 8 of the lamp 5 so that it bears on it, and which is provided with the said projection 25 towards the inside of the frame element 14, the projection being made to project from the face 27 from the edge 24 towards the aperture 21. The face 27 is also provided with appropriate recesses to receive the pins 10, the recesses consisting of a pair of reference through holes 28 formed to pass completely through the plate 20 and capable of receiving the pins 10, and corresponding guide channels 29 to facilitate the insertion of the pins 10 into the holes 28, the channels forming, on the face 27, shallow grooves which extend from the edges 23, interrupting the edge 24, to the positions of the holes 28.

With reference to Figures 1, 7, 8 and 12, the cup 13 comprises an end wall 30 facing the reflector 1, this wall being provided with a through aperture 31 for the passage of the bulb 7 of the lamp 5, and a substantially cylindrical lateral wall 32, which extends orthogonally to the end wall 30 and is connected to the internal lateral wall of the collar 3; the cup 13 is preferably formed in one piece from pressed sheet and is fixed securely to the body 2 of the headlight 1 inside the collar 3 by means of self-tapping screws 33 (or other suitable fixing means) inserted through corresponding holes 34 formed so that they pass through corresponding terminal lugs 35, bent at 90°, of the lateral wall 32. A hole for the earth connection 36 is also formed on one lug.

An internal face 37 of the wall 30, facing the frame element 14, is provided with appropriate retaining bosses 38 for the transverse plate 20 of the element 14, which can thus interact with the wall 30 by bearing on it, by having its flat face 26, which is free of projections, bearing on the bosses 38. The lateral wall 32 is also provided with a longitudinal semi-cylindrical reference boss 40 (Figure 4), disposed radially on the inside along the whole axial extension of the wall from the end wall 30 in a predetermined angular position, this boss being capable of interacting with one of the radial edges 23 of the flared portion 22 of the aperture 21 (the left-hand edge in Figure 12 in the present case) to guide the insertion of the element 14, and particularly its plate 20, into the cup 13 and, simultaneously, to guide the bulb 7 of the lamp 5 so that it is correctly inserted into the aperture 31 of the cup 13.

Finally, the end wall 30 of the cup 13 is also provided with apertures 41, of a known type, for the attachment of a coloured filter, for example a yellow filter, which is known and which, for simplicity, is not illustrated.

The bayonet connection 15 comprises, according to the invention, a pair of L-shaped flanges 43 (Figures 8 and 12-14) formed by partial cuts in the lateral wall 32 and coplanar with it, each of the flanges being provided with a corresponding indentation 44 on a side facing the end wall 30 of the cup 13, and a pair of corresponding wings 45 capable of being inserted with a bayonet fitting into the indentations 44 of the flanges 43 and extending laterally on opposite sides from the frame element 14, parallel to the transverse plate 20 and in a position to its rear; the wings 45 (Figures 5 and 6) are formed by corresponding rounded extensions 46 of corresponding metal springs 47 carried by and secured to the frame element 14, being clamped to the side members 18, 19 on opposite sides.

In particular, the springs 47 are made in the form of rectangular metal plates, each carrying at one end an extension 46, disposed substantially at a right angle and on the outside of the frame 14 with respect to the side members 18, 19, and rounded so that it is convex on the side opposite the plate 20; the springs 47 are also provided on their longitudinal edges with two pairs of opposing wings bent at right angles, and indicated by 48 and 49 respectively, the first being formed in intermediate positions and the second at the ends opposite the wings 45. In use (Figures 1 and 12), the wings

48 on opposite sides bear on corresponding upper and lower edges 50 and 51 (Figure 3) of the side members 18, 19, while the wings 49 are clamped to the side members 18, 19 by engagement in corresponding slots 52 (Figure 3) formed in a rear position towards the bar 17 on the edges 50, 51 of both side members 18, 19.

According to a last characteristic of the invention, the elastic pressure element 16 designed to retain the lamp 5 securely on the frame 14 consists of a fork-shaped element (Figures 9 and 10) carried on the frame element 14 so that it is free to swing (Figure 1), being hinged to the frame element about an axis parallel to the plate 20 and shaped, as is the frame 14, in such a way that, when the lamp 5 is secured, the socket 6 of the lamp 5 is disposed inside the frame element 14, between corresponding prongs 56 of the fork-shaped element 16.

In particular, the fork-shaped element 16 is formed in one piece from pressed sheet and has its prongs 56 shaped, in its terminal portion 57, to form arcs of a circumference having an axis of symmetry parallel to and eccentric with respect to the axis of hinging of the element 16. This is defined by a pair of opposing holes 58 (only one of which is visible in Figure 10) formed through corresponding opposing lug-shaped lateral extensions 59 of the element 16; transverse pins 60 (Figures 2 and 3) carried on opposite sides of the side members 18, 19, and formed in one piece on the side members on the inside of the frame element 14, pass freely through the holes 58.

In this way the fork-shaped element 16 may be moved selectively between a first operating position (Figure 12) in which the prongs 56 secure the flange 8 of the lamp 5 elastically under pressure (as a result of their elasticity and the eccentricity of their curvature with respect to the axis of rotation defined by the pins 60) against the face 27 of the plate 20, and a second operating position (Figure 11) in which the prongs 56 are disposed virtually parallel to the plate 20 as a result of a rotation of the element 16 in the direction of the arrow A, so that (because of the cam effect due to the eccentricity of their curvature with respect to the axis of rotation) it does not interact with the flange 8.

To enable it to be moved between the said first and second positions, the fork-shaped element 16 has an actuating arm 62 disposed parallel to and below the bar 17 and provided below, on the side opposite the prongs 56, with a strip 63 partially cut to form a Faston connector for a known earth wire 64 (Figure 12); at the free end, opposite the prongs 56, the element 16 has an extension 66 forming a grip element for the fingers of a user's hand (not illustrated) and/or for a tool. In order to facilitate grasping, the grip element 66 is formed so that it is disposed next to a concavity 68 (Figures 1 and 3) of the bar 40, formed in the lower edge of the said bar, in a position below a suitably shaped milled end grip 70. Similarly, to facilitate the passage of the power supply cable 6b to the socket 6 of the lamp 5 when in use, the frame 14 is provided with a channel 72 at the base of the bar 17 (Figures 2 and 3).

The operation of the lamp-holder 12 is as follows. The lamp 5 is connected to the power supply cable 6b and then, with the fork-shaped element 16 held in the said second operating position (Figure 11), the lamp 5 is inserted into the aperture 21 and, by following the channels 29, the pins 10 of the flange 8 are inserted into the holes 28 in the plate 20, thus correctly positioning the lamp 5, whose cut-out 9 will bear on the prominence 25. Subsequently (Figure 12), the element 16 is rotated so that the prongs 56 press against the flange 8, securing the lamp 5 to the frame 14, the earth wire 64 is connected to the strip 63, and, with the grip 70 of the bar 17 grasped in the hand, the assembly consisting of the frame 14 and the lamp 5 is inserted into the aperture 31 of the cup 13 along the boss 40. Finally (Figures 13, 14), the frame 14 is rotated (arrow B) so that the wings 45 are engaged under the flanges 43 of the cup 13. During these operations, any accidental catching of the frame and lamp assembly is prevented since there are no projecting parts, except for the wings 45, which are shielded by the flat face 26 of the flange 20. To replace the lamp 5, the operations described are performed in reverse order, the element 16 being released by pressing the extension 66.

Claims

1. Lamp-holder (12) for vehicle headlight lamps, the lamp (5) comprising a bulb (7), a socket (6) and a flange (8) disposed between the bulb and the socket, and provided with axial centring pins (10), characterised in that it comprises a cup (13) which may be housed securely in a collar (3) of a reflector of the headlight and is provided with a through aperture (31) for the passage of the lamp bulb, a frame element (14) supporting the lamp in such a way that it may be released, and a bayonet connection (15) by means of which the frame element is inserted into and connected to the cup (13) in such a way that it may be released; the frame element comprising a transverse plate (20) which is disposed to face the cup and through an aperture (21) in which the lamp bulb is made to pass, the said plate having a first face (26), which is completely flat and free of projections, facing the

cup and capable of interacting with an end wall (30) of the cup by bearing on it, and a second face (27), opposite the first, capable of receiving the flange (8) of the lamp to bear on it and provided with recesses (28, 29) to receive the said axial centring pins of the flange; the lamp-holder further comprising an elastic pressure element (16) to secure the flange of the lamp by pressure, in such a way that it may be released, against the second face (27) of the plate (20).

2. Lamp-holder (12) according to Claim 1, characterised in that the said recesses comprise corresponding reference through holes (28) formed to pass through the said plate (20) and capable of receiving the said pins (10) of the lamp flange, and corresponding guide channels (29) for the pins formed on the second face of the said plate, extending from corresponding opposite radial oblique edges (23) of a flared portion (22) of the said through aperture (21) for the bulb formed through the said plate to the positions of the said holes (28), the said flared portion of the through aperture extending to form a gap which interrupts a perimetric edge (24) of the said plate, substantially in a position opposite a prominence (25) facing the inside of the frame element (14) and formed on the said second face (27) of the plate from the said perimetric edge towards the said aperture, the said prominence (25) being shaped so that it can interact with a lateral cut-out (9) of the said intermediate flange (8) of the lamp by bearing on it.

3. Lamp-holder (12) according to Claim 2, characterised in that the said cup (13) comprises the said end wall, which is provided with the said through aperture for the passage of the lamp bulb and, on an internal face (37) facing the frame element (14), with corresponding retaining bosses (38) for the said transverse plate of the frame element; and a substantially cylindrical lateral wall (32) provided with a longitudinal semicylindrical reference boss (40), disposed radially on the inside along the whole axial extension of the wall from the end wall in a predetermined angular position, this boss being capable of interacting with one of the said radial oblique edges (23) of the flared portion (22) of the aperture of the plate to guide the insertion of the lamp bulb into the aperture (31) of the cup.

4. Lamp-holder (12) according to Claim 3, characterised in that the end wall of the cup (13) is provided with apertures (41) for the attachment of a coloured filter.

5. Lamp-holder (12) according to Claim 3 or 4, characterised in that the said bayonet connection (15) comprises a pair of L-shaped flanges (43) formed by partial cuts in the lateral wall (32) of the cup and each provided with a corresponding indentation (44) on a side facing the end wall of the cup, and a pair of corresponding wings (45) capable of being inserted with a bayonet fitting into the indentations of the flanges of the cup, the said wings extending laterally on opposite sides from the frame element (14), parallel to the transverse plate (20) and in a position to its rear, and being formed by corresponding rounded extensions (46) of corresponding metal springs (47) carried by and secured to the frame element, being clamped to corresponding opposite side members 18, 19 of the said frame element.

6. Lamp-holder (12) according to one of the preceding claims, characterised in that the said elastic pressure element consists of a fork-shaped element (16) carried on the frame element (14) so that it is free to swing, being hinged to the frame element about an axis parallel to the said plate (20), the socket of the lamp being disposed inside the frame element between corresponding prongs (56) of the fork-shaped element, the latter element being selectively movable between a first operating position in which the said prongs (56) secure the flange of the lamp elastically under pressure against the second face of the plate (20), and a second operating position in which the prongs (56) are disposed so that they do not interact with the intermediate flange (8) of the lamp (5).

7. Lamp-holder (12) according to Claim 6, characterised in that the said fork-shaped element (16) is formed in one piece from pressed sheet and has its prongs (56) shaped, in its terminal portion, to form arcs of a circumference having an axis of symmetry parallel to the axis of hinging of the element, which is defined by a pair of opposing holes (58) formed through corresponding opposing lateral extensions (59) of the fork-shaped element, with transverse pins (60), carried on opposite sides of the side members (18, 19) of the frame element on the inside of the said element, passing freely through the holes.

8. Lamp-holder (12) according to Claim 7, characterised in that the said frame element (14) is provided, on the side opposite the said transverse plate (20), with a grip bar (17) which is

parallel to the side members (18, 19) and from which the side members extend towards the plate in an asymmetrical way; and in that the fork-shaped element has an actuating arm (62) disposed parallel to and below the said bar (17) of the frame element and provided below, on the side opposite the prongs, with a strip (63) partially cut to form a Faston connector for an earth wire and, at the free end, with an extension (66) capable of forming a grip element and disposed next to a concavity (68) of the grip bar which is shaped in such a way as to enable the grip element to be grasped.

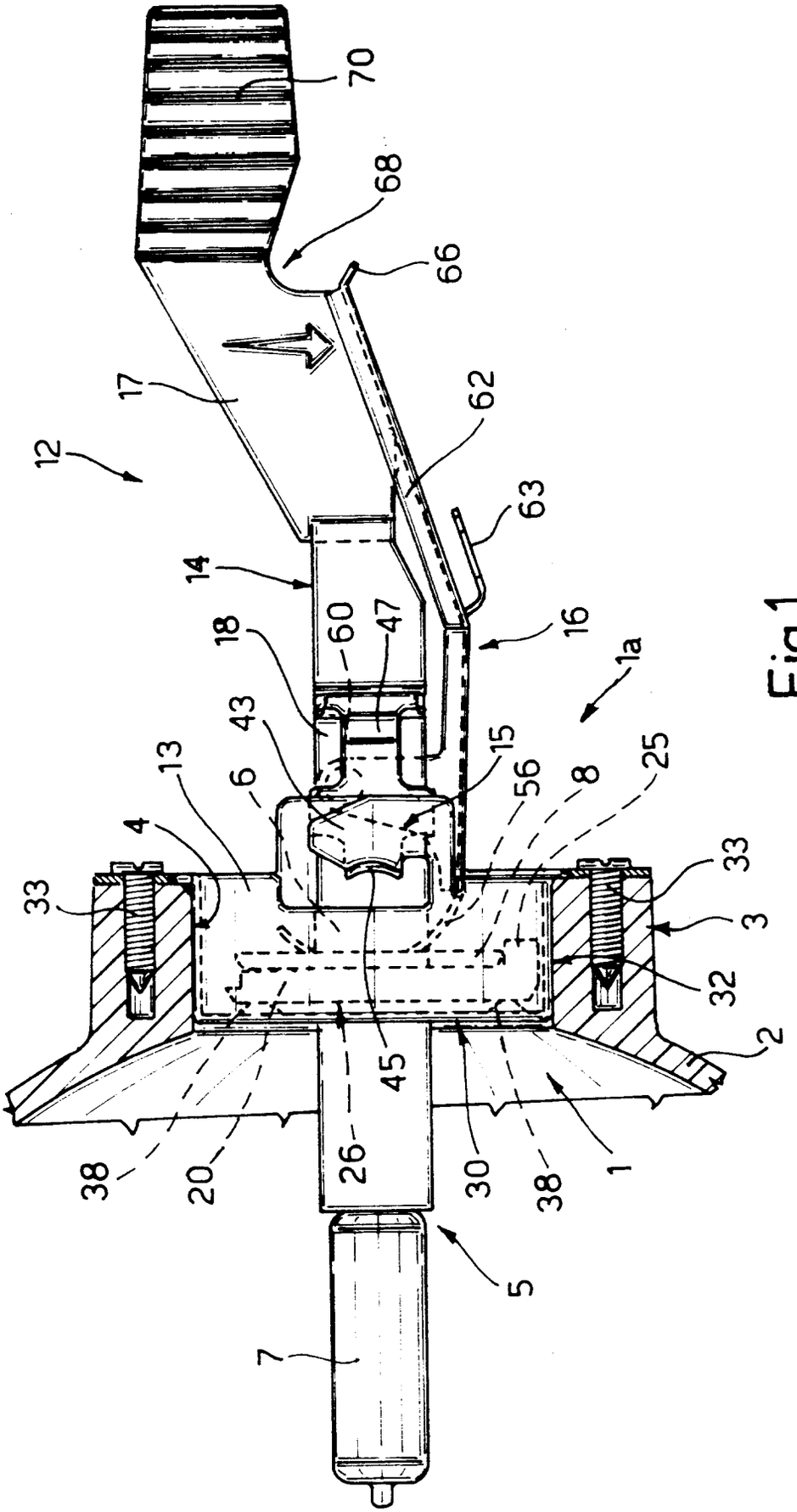
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Fig.1

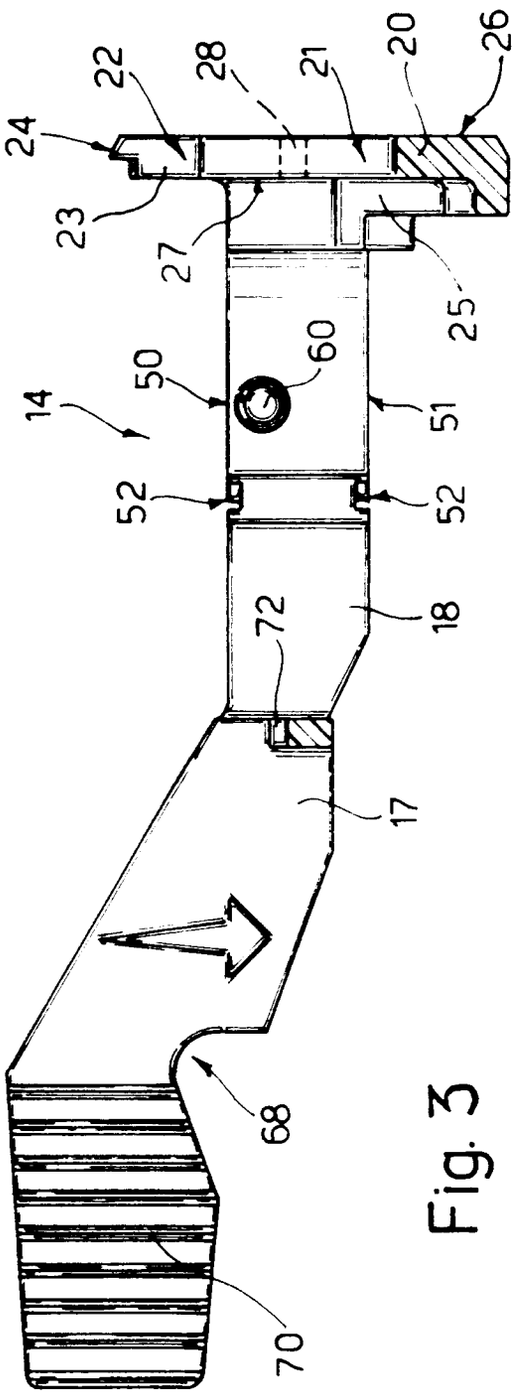
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Fig. 3

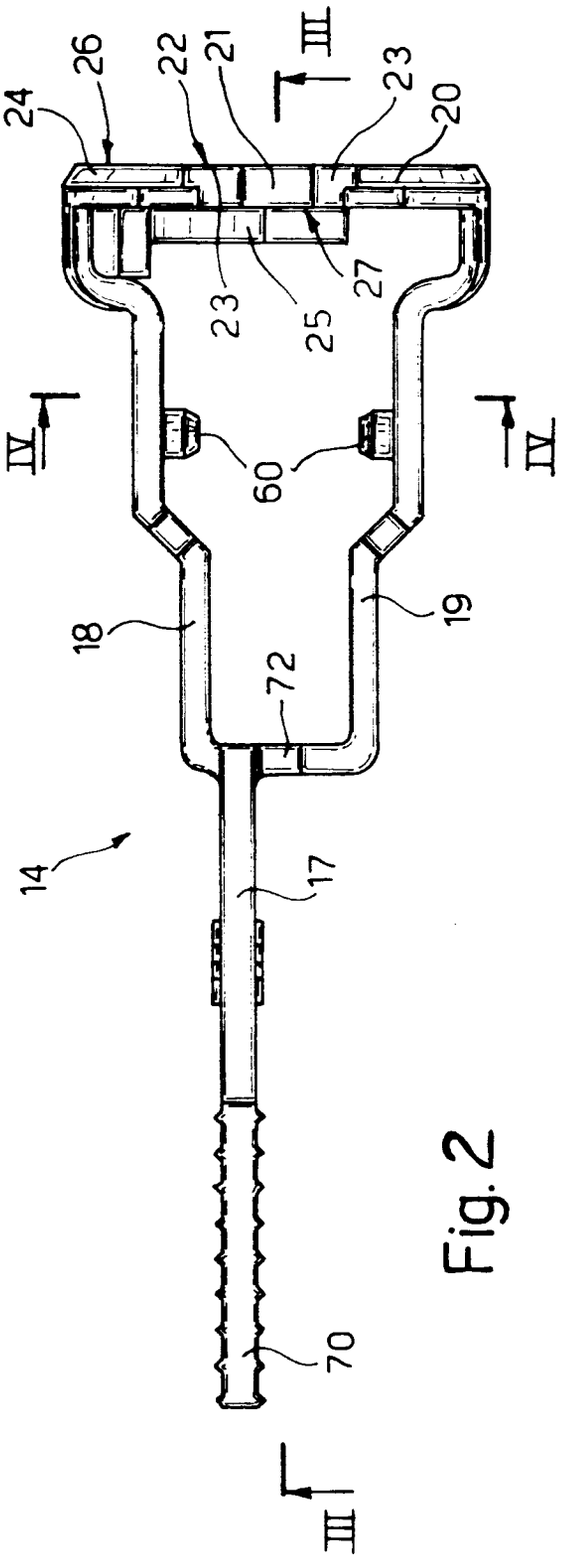
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Fig. 2

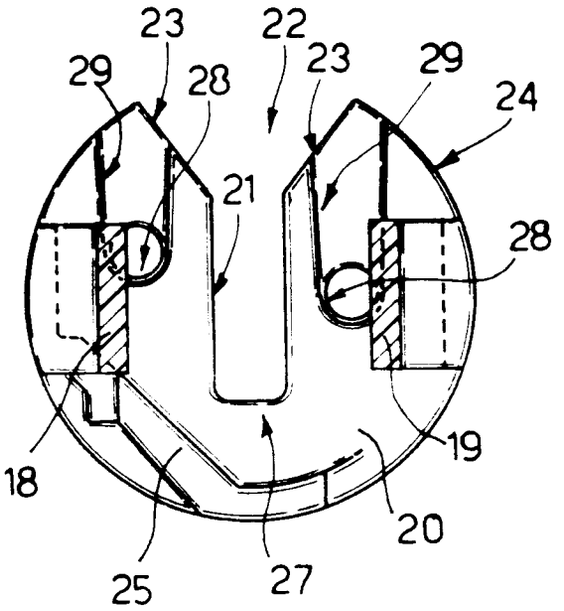
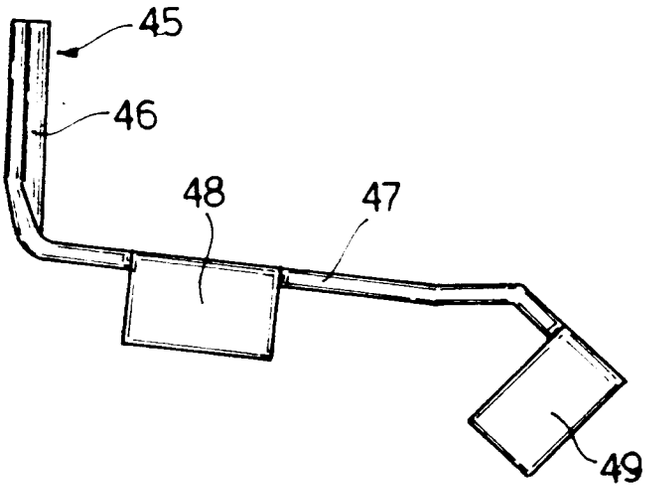


Fig. 4

Fig. 5



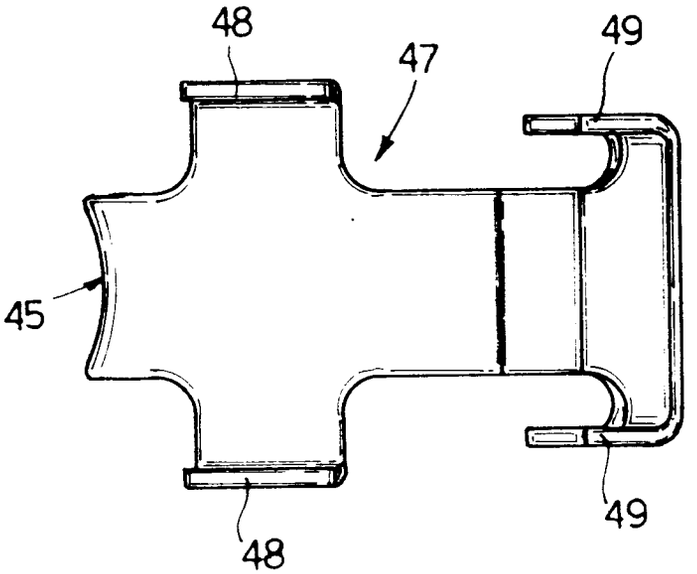


Fig. 6

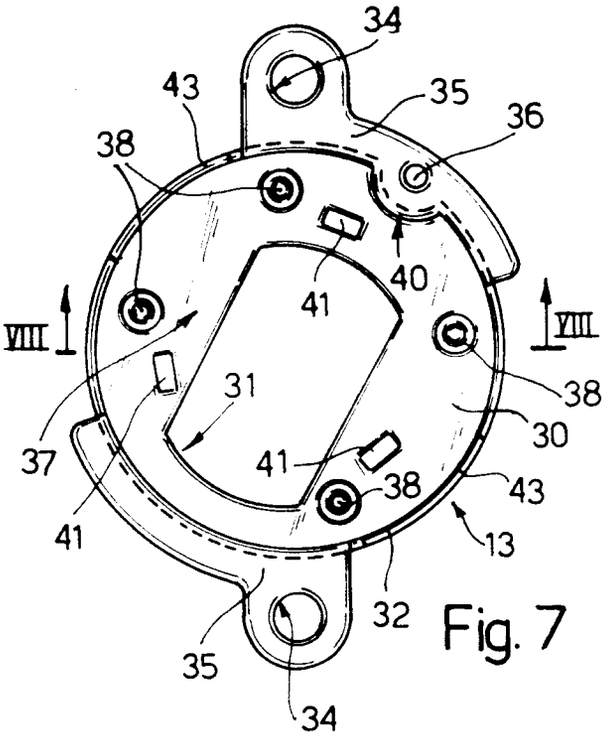


Fig. 7

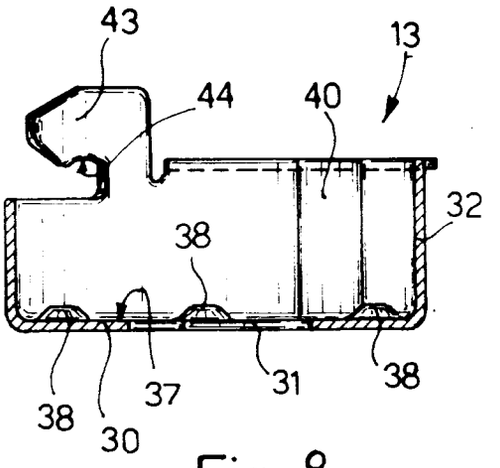


Fig. 8

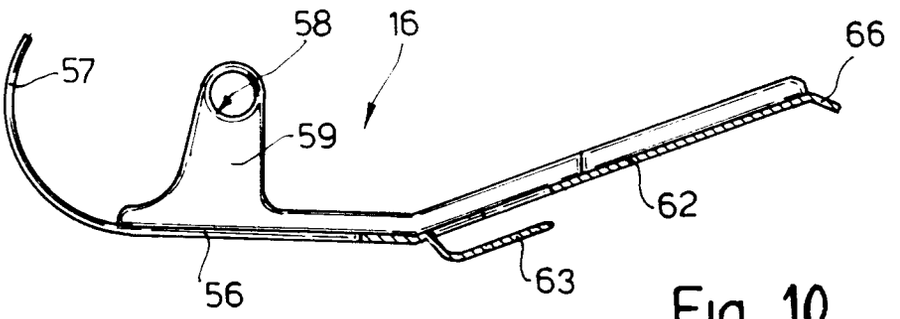


Fig. 10

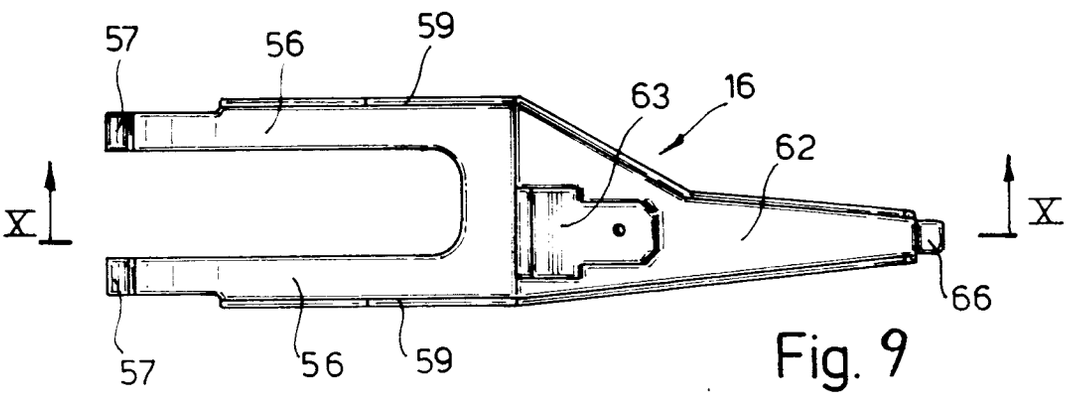


Fig. 9

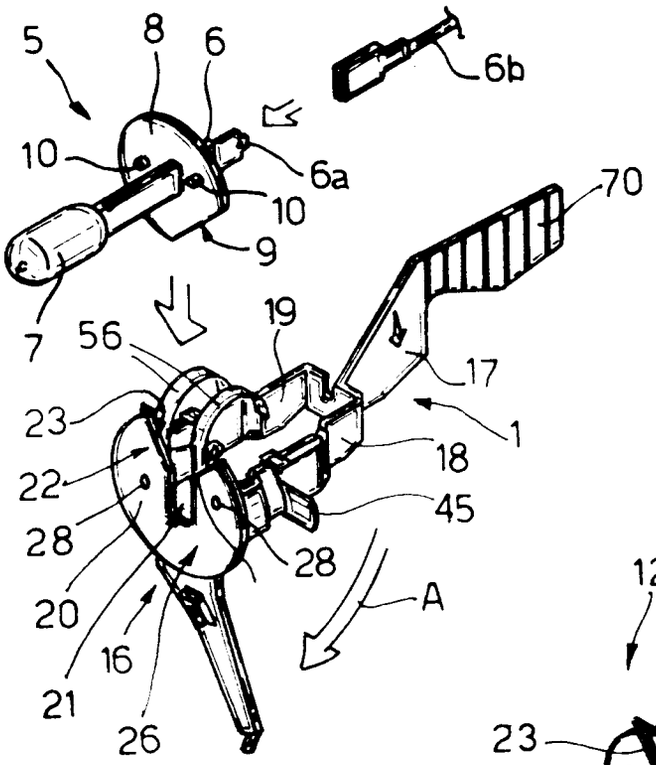


Fig.11

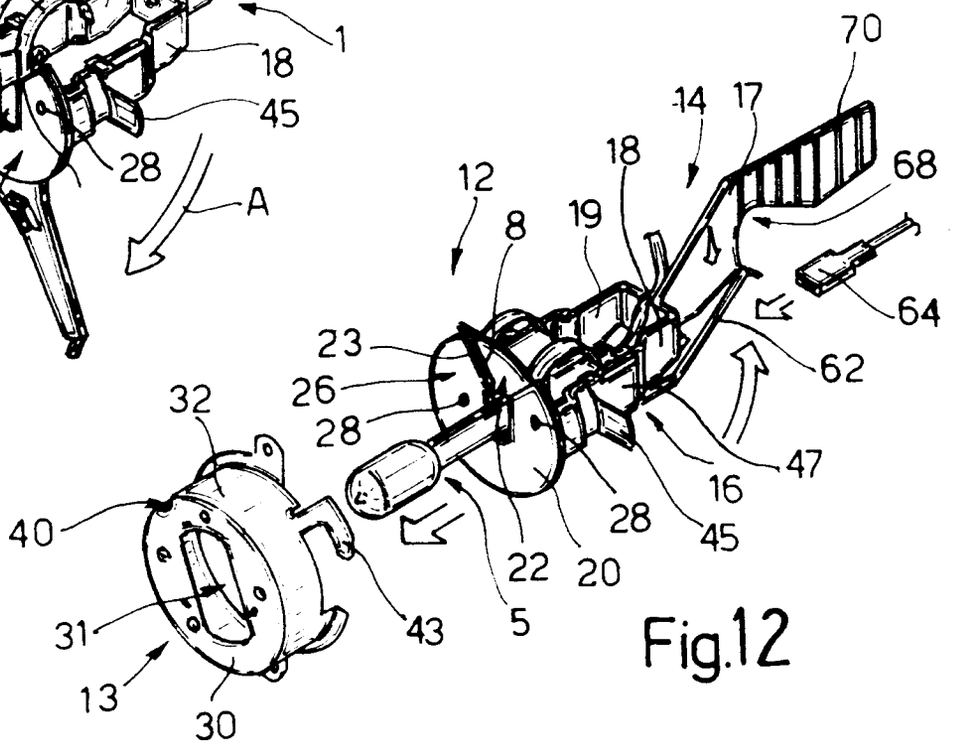


Fig.12

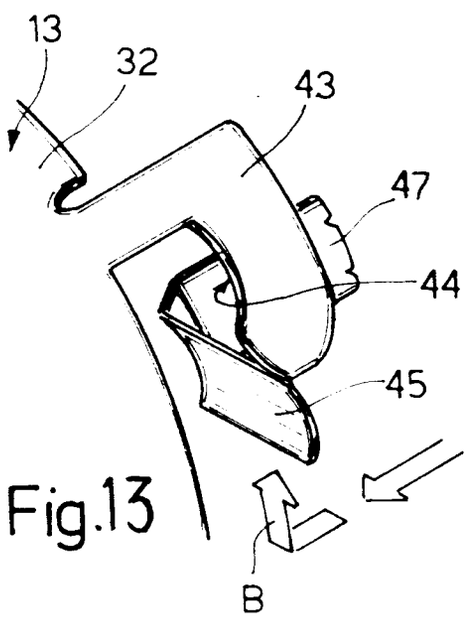


Fig.13

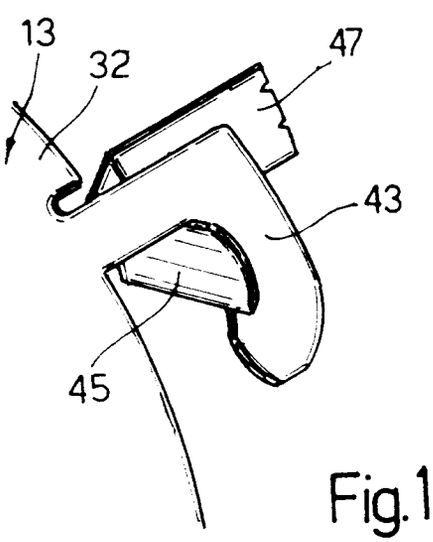


Fig.14

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 11 7596

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	FR-A-2 670 271 (CARELLO S.P.A.) * the whole document * ---	1	F21M7/00
A	FR-A-2 050 587 (S. A. POUR L'EQUIPEMENT ELECTRIQUE DES S.E.V. MARCHAL) * page 2, line 9 - page 4, line 6 * * figures 1,2 * ---	1	
A	DE-A-21 22 103 (ROBERT BOSCH GMBH) * page 4, line 12 - line 23 * * page 5, line 11 - page 6, line 14 * * page 6, line 21 - page 7, line 3 * * figure 1 * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

F21M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 February 1994	De Mas, A

CATEGORY OF CITED DOCUMENTS

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