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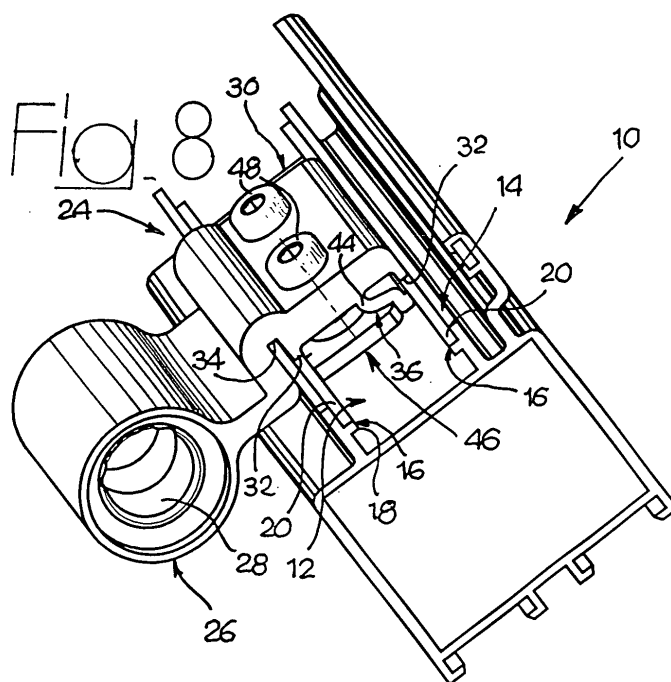
(54) Hinge element for aluminium door and window frames

(57) A hinge element destined for mounting on an aluminium door or window frame (10) having a longitudinal channel (12) with an undercut profile, including:

- a mounting section (30) having contact surfaces (32) suitable for resting against corresponding portions of the external longitudinal surfaces (20) of the groove (42),
- an anchorage plate (46) suitable for being inserted into said groove (12), and
- at least one mounting screw (48) for fixing said an-

chorage plate (46) to said mounting portion (30).

The mounting section (30) includes a projecting anchorage portion (36) having an anchorage surface (38) that is destined to be pressed against a portion of a first internal longitudinal surface (22) of the groove (12), the anchorage plate (46) having a first longitudinal surface (58) that is destined to press against the projecting anchorage portion (36) and a second longitudinal surface (54) that is destined to press against a second internal longitudinal surface (22).



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Description

[0001] The present invention concerns a hinge element for aluminium door and window frames of the type defined in the preamble of claim 1.

[0002] In the known solutions, the framework of aluminium door and window frames includes a longitudinal groove with an undercut profile that serves for fixing the hinge elements in positions adjustable in the longitudinal direction. Each of the two hinge elements that form the complete hinge is fixed to the frame of a door or window via an anchorage plate that is inserted inside the undercut groove and is connected to a mounting section of the hinge element via a pair of mounting screws. The anchorage plate is inserted into the undercut groove in the longitudinal direction, starting from one end of the groove. To do this it is necessary, however, to first insert the anchorage plate inside the undercut groove of the frame before assembling the framework.

[0003] European patent application n. 02005578.6, filed by the same Applicant (still unpublished at the date of filing of the present application), describes a hinge for aluminium door and window frames equipped with two substantially L-shaped anchorage plates that can be inserted inside the undercut groove by making them pass through the longitudinal aperture. This solution therefore allows hinges to be mounted on finished frameworks without having to first insert the hinges' anchorage plates inside the undercut grooves before completing the assembly of the frame.

[0004] The object of the present invention is to provide a simple and economic solution that allows the fixing of a hinge element to the frame of an aluminium door or window without the need of inserting the relative anchorage plate from one end of the longitudinal groove.

[0005] According to the present invention, this objective is achieved by a hinge element possessing the characteristics specified in the claims.

[0006] The present invention will now be described in detail with reference to the attached drawings, supplied merely as a non limitative example, where:

- Figures 1, 3 and 5 are perspective views illustrating the mounting sequence of a hinge element in accordance with the present invention,
- Figures 2, 4 e 6 are cross-sections relative to the same mounting sequence in Figures 1, 3 and 5,
- Figure 7 is a larger-scale cross-section illustrating the position in which the clamping screws are not yet tightened,
- Figure 8 is a perspective view illustrating the final mounting state of the hinge element,
- Figure 9 is a cross-section corresponding to Figure 7 illustrating the final mounting state, and
- Figure 10 is a perspective view of the anchorage plate.

[0007] Referring to the figures, reference 10 indicates

a section of an element in extruded aluminium forming part of a frame for a door or window fitting for houses, offices, shops, etc. The frame section 10 includes a longitudinal groove 12 with an undercut profile. The groove 12 is defined between two integral projecting portions 14 having respective longitudinal ribs 16 that face each other to define a longitudinal opening 18. Each of the two longitudinal ribs 16 has an external longitudinal surface 20 and an internal longitudinal surface 22.

[0008] The shape of the aluminium profile forming the frame is to be considered as substantially conventional and has been described here simply to render the manner in which the hinge element is mounted easier to understand, but it has been understood that this form in no way limits the scope of application of the present invention. For the purposes of this invention, it is sufficient that the frame section 10 has an undercut profile groove with two internal longitudinal surfaces to permit the anchorage of the hinge element in the manner that will be described in the following.

[0009] Reference 24 indicates a hinge element in accordance with the present invention. The hinge element 24 is destined to cooperate with a complementary hinge element (non illustrated) for hinging a door or window (not illustrated) onto the frame 10. The hinge element 24 includes an articulated joint section 26 equipped with a pivot hole 28 or a hinge pin. The hinge element 24 includes a mounting section 30 preferably obtained in a monolithic form with the articulated joint section 26. Preferably, the hinge element 24 is obtained via the extrusion of aluminium bars. Consequently, the profile of the hinge element 24 remains substantially constant in the longitudinal direction.

[0010] The mounting section 30 of the hinge element 24 includes two longitudinal contact surfaces 32 that are destined to rest against corresponding portions of the external longitudinal surfaces 20 of the frame section 10. The hinge element 24 includes a longitudinal groove 34 adjacent to the longitudinal contact surface 32 closest to the articulated joint section 26.

[0011] The mounting section 30 of the hinge element 24 also includes a projecting anchorage portion 36 obtained in an integral manner with the remaining part of the hinge element 24. The projecting anchorage portion 36 has an anchorage surface 38 facing onto the contact surface 22 furthest away from the articulated joint section 26. The anchorage surface 38 is destined to engage the corresponding internal longitudinal surface 22 of the rib 16 in a manner that will be described further on. The projecting anchorage portion 36 has a contact surface 40 and, at 90° with respect to the latter, a reference surface 42. The projecting anchorage portion 36 is connected to the remaining part of the mounting section 30 via a deformable zone 44 that is somewhat removed in the transverse direction with respect to the contact surface 40. With reference to Figures 5 to 10, the hinge element 24 includes an anchorage plate 46 that is connected to the mounting section 30 via at least one mounting screw

48. In the form of embodiment illustrated in the figures, two mounting screws 48 are provided, which extend through the respective holes 50 of the mounting section 30 with play and engage the respective threaded holes 52 of the anchorage plate 46. The width L (Figure 10) of the anchorage plate 46 is such that the plate 46 can be inserted into the groove 12 by passing through the longitudinal opening 18. In the form of embodiment illustrated in the figures, the width L of the anchorage plate 46 is less than the width of the longitudinal opening 18. Alternatively, as long as the anchorage plate 46 can always be inserted through the longitudinal opening 18, the width of the plate 46 could be equal or greater than the width of the longitudinal opening 18. For example, in the case where the width L of the anchorage plate 46 is greater than the width of the opening 18, the anchorage plate 46 could be made to pass through the opening 18 in an inclined position. The anchorage plate 46 is preferably made of steel and has a longitudinal edge 54 equipped with anchorage teeth 56.

[0012] The mounting sequence of the hinge element in accordance with the present invention is as follows.

[0013] With reference to Figures 1 and 2, the hinge element 24 is initially positioned in an inclined manner with respect to the longitudinal groove 12, in a position whereby the contact surface 32 furthest away from the articulated joint section 26 rests against the corresponding surface 20 and the contact surface 32 closest to the articulated joint section 26 is set apart from the corresponding longitudinal contact surface 20 (condition illustrated in Figures 1 and 2). Subsequently, the hinge element 24 is then made to rotate as shown in Figure 4. Following this rotation, the projecting portion 14 enters into the groove 34 of the hinge element 24 and both of the contact surfaces 32 of the hinge element 24 rest against the corresponding longitudinal contact surfaces 20. During the rotation from the configuration in Figure 2 to the configuration in Figure 4, the projecting anchorage portion 36 enters into the undercut groove 12 and the anchorage surface 38 of the projecting portion 16 comes into a position facing the internal longitudinal surface 22.

[0014] At this point, as is illustrated in Figures 5 and 6, the anchorage plate 46 is inserted into the groove 12, after making it pass through the opening 18. The anchorage plate 46 is positioned such that its threaded holes 52 are aligned with the holes 50 of the mounting section 30. The mounting screws 48 are then inserted into the holes 50 and 52. Figure 7 illustrates the state in which the screws 48 have engaged the threaded holes 52 but have not yet been tightened. In this state, it can be noted that the anchorage edge 54 of the anchorage plate 56 and the anchorage surface 38 of the projecting anchorage portion 36 are slightly separated from the respective internal longitudinal surfaces 22.

[0015] Lastly, the mounting screws 48 are tightened with a tool (a socket head key for example). During tightening of the screws 48, the anchorage edge 54 of the

plate 46 is clamped against the corresponding internal longitudinal surface 22 and the anchorage teeth 56 bite into the surface 22. Simultaneously, the opposite longitudinal edge 58 of the anchorage plate 46 rests against the surface 40 of the projecting anchorage element 46 and applies a force on this surface that produces a small deformation of the projecting anchorage portion 36. Following this deformation, the anchorage surface 38 of the projecting anchorage portion 36 is brought into contact with the internal longitudinal surface 22, as shown in Figure 9. At this point, the mounting of the hinge element 24 is complete.

[0016] The solution in accordance with the present invention offers the advantage of using a single anchorage plate 46 that is inserted into the longitudinal groove 12 through the opening 18, and thus without the necessity of inserting the anchorage plate 46 in the groove 12 before having completed the assembly of the framework. The solution in accordance with the invention is economical due to the use of a single anchorage plate 46. The projecting anchorage portion 36 is obtained in an integral manner with the mounting section 30 by opportunely shaping the extrusion head utilized for the production of the hinge element 24 and therefore without any particular increment in production costs for the hinge element. In addition, the mounting operation for the hinge element 24 results as being particularly simple due to the fact that a single anchorage plate 46 is used.

[0017] Naturally, the principle of the invention being understood, the constructional details and forms of embodiment could be extensively changed with respect to that described and illustrated without leaving the scope of the present invention, as defined by the following claims.

Claims

1. A hinge element destined to be fixed to a frame (10) of an aluminium door or window having a longitudinal groove (12) with an undercut profile, in which said frame (10) presents, in correspondence with said groove (12), a pair of external longitudinal surfaces (20) and a pair of internal longitudinal surfaces (22) arranged on opposite sides of two longitudinal ribs (16) defining the opening (18) of said longitudinal groove (12), the hinge element (24) including:
 - a mounting section (30) having contact surfaces (32) suitable for resting against corresponding portions of said external longitudinal surfaces (20),
 - an anchorage plate (46) suitable for being inserted into said groove (12), and
 - at least one mounting screw (48) for fixing said anchorage plate (46) to said mounting portion (30),

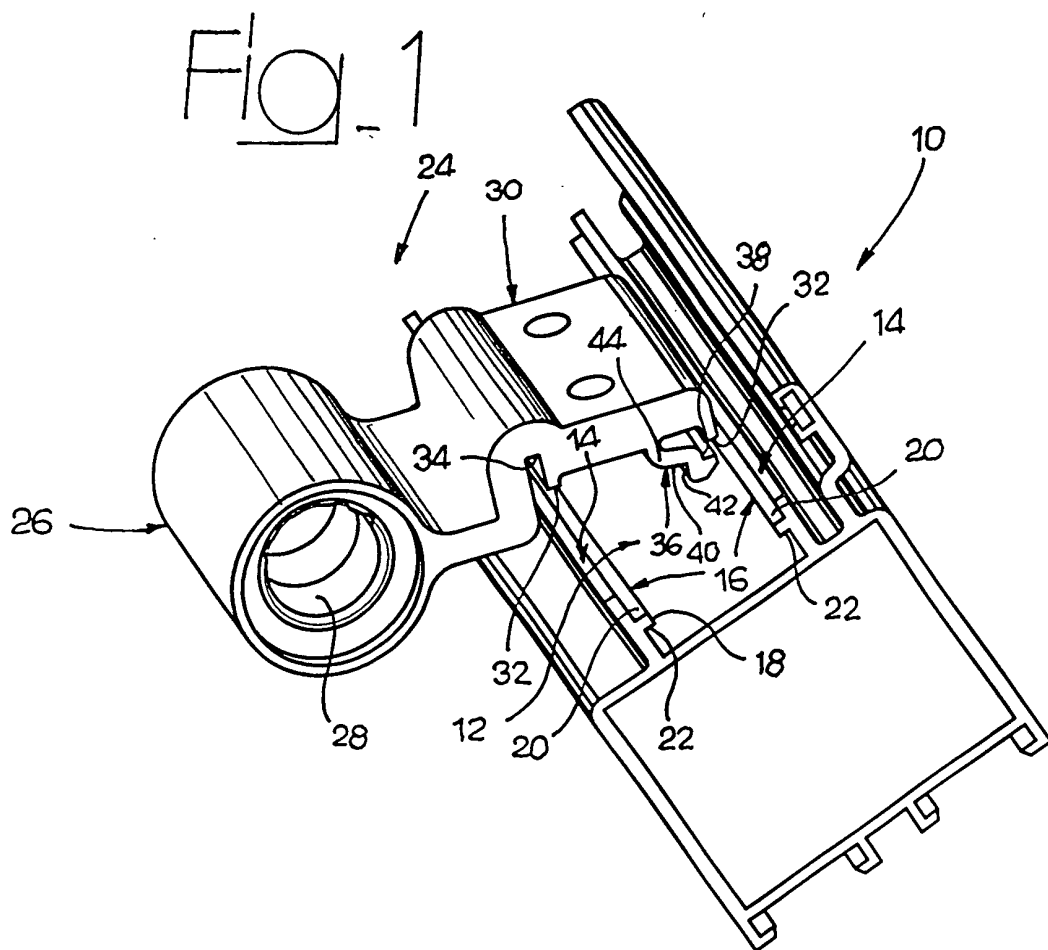
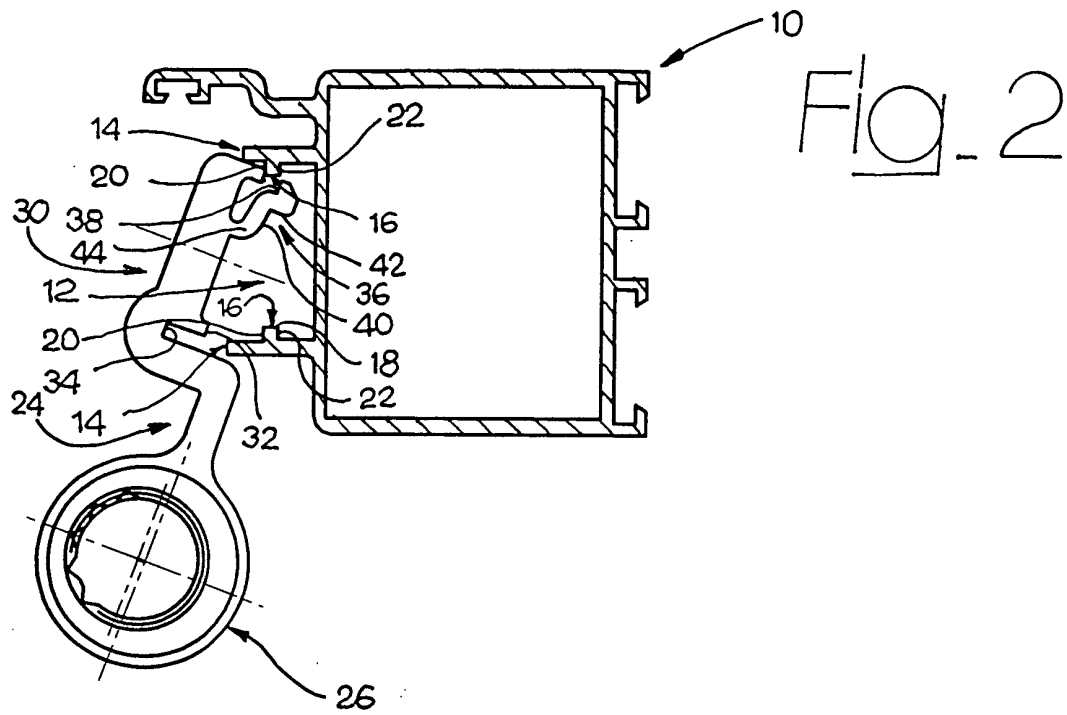
characterized in that said mounting section (30) includes a projecting anchorage portion (36) having an anchorage surface (38) that is destined to be pressed against a portion of a first one of said internal longitudinal surfaces (22) of the groove (12), the anchorage plate (46) having a first longitudinal surface (58) that is destined to press against said projecting anchorage portion (36) and a second longitudinal surface (54) that is destined to press against a second one of said internal longitudinal surfaces (22). 5 10

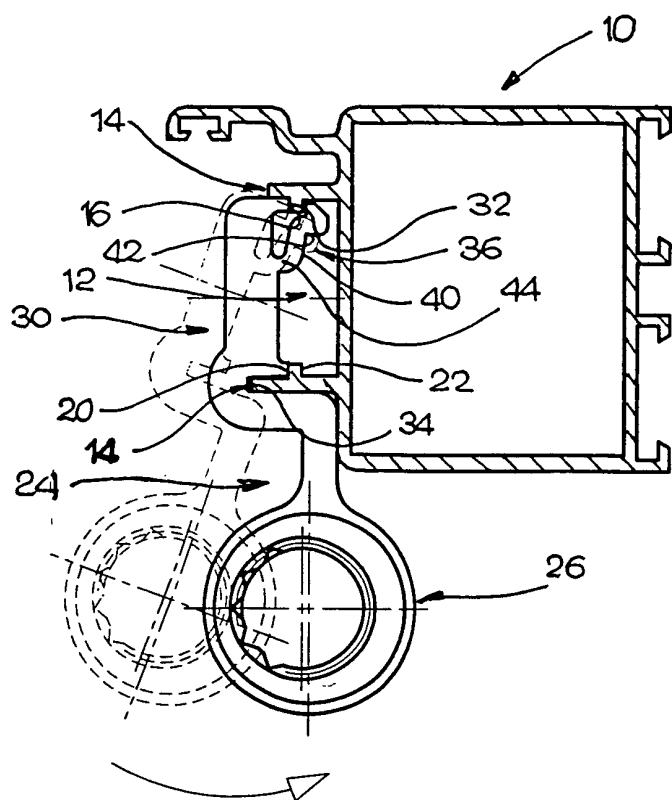
2. A hinge element according to claim 1, **characterized in that** said projecting anchorage portion (36) is obtained in an integral manner with said mounting section (30). 15
3. A hinge element according to claim 1, **characterized in that** said second longitudinal surface (54) of the anchorage plate (46) is equipped with anchorage teeth (56). 20
4. A hinge element according to claim 1, **characterized in that** said projecting anchorage portion (36) is connected to the remaining part of the mounting section (30) via a deformable zone (44). 25
5. A hinge element according to claim 4, **characterized in that** said projecting anchorage portion (36) has a contact surface (40) against which a longitudinal edge of the anchorage plate (46) acts, said contact surface (40) being spaced from said deformable zone (44) in the transverse direction. 30
6. A hinge element according to claim 1, **characterized in that** the width of said anchorage plate (46) is such that it can be inserted into said longitudinal groove (12) by passing through the opening (18) of said groove (12). 35 40
7. A hinge element according to claim 6, **characterized in that** the width of said anchorage plate (46) is less than the width of said opening (18). 45

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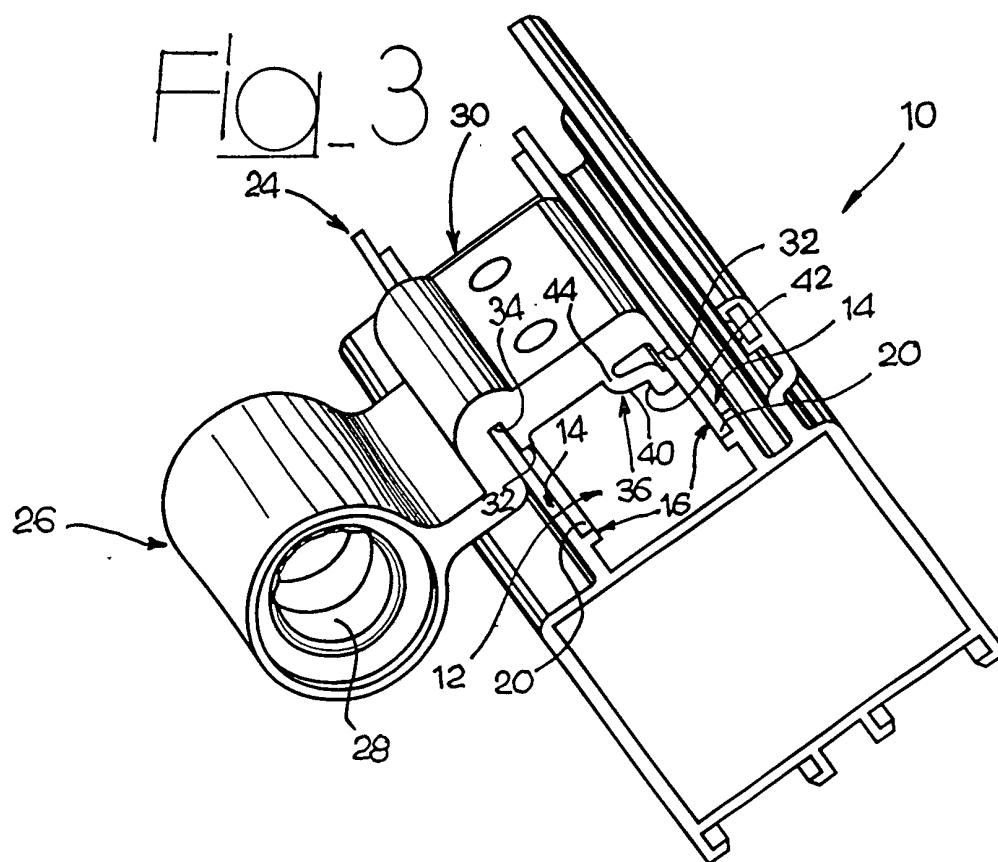
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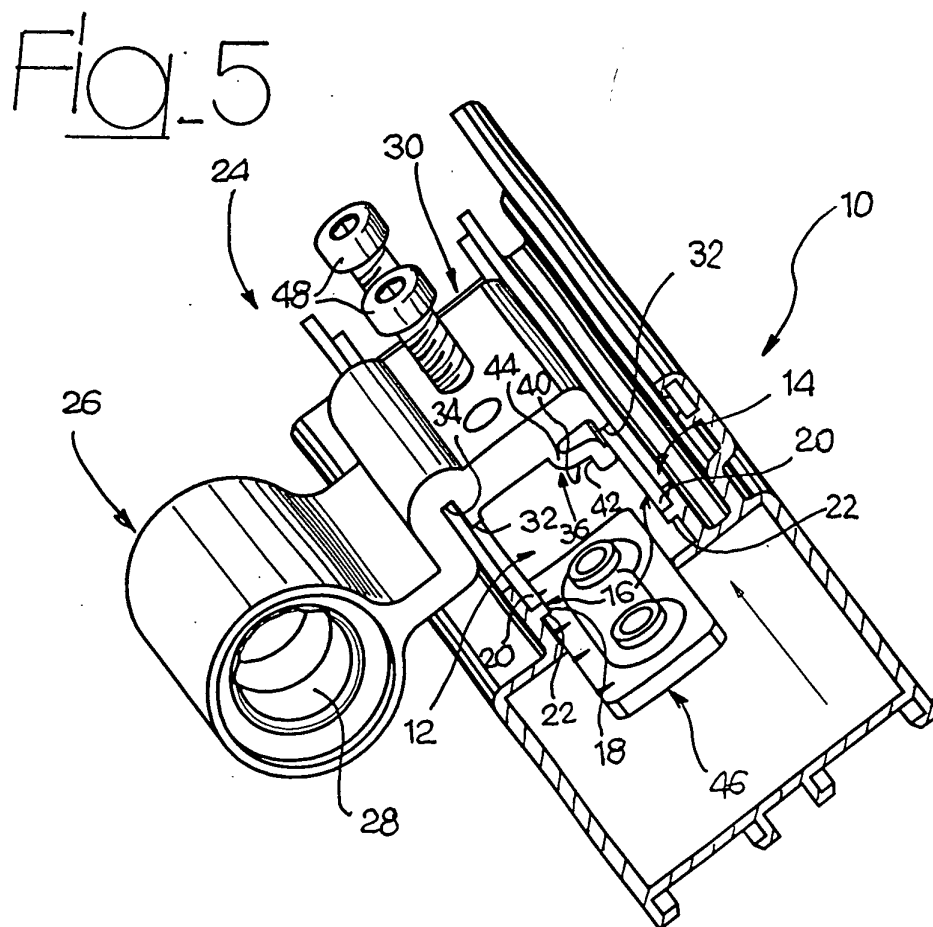
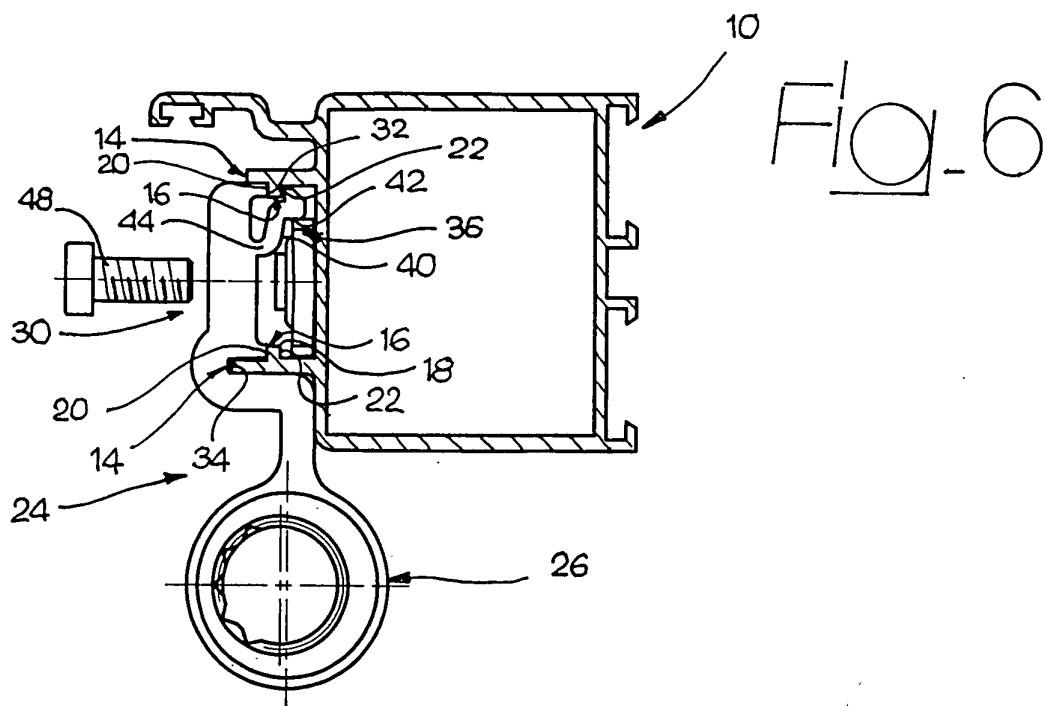
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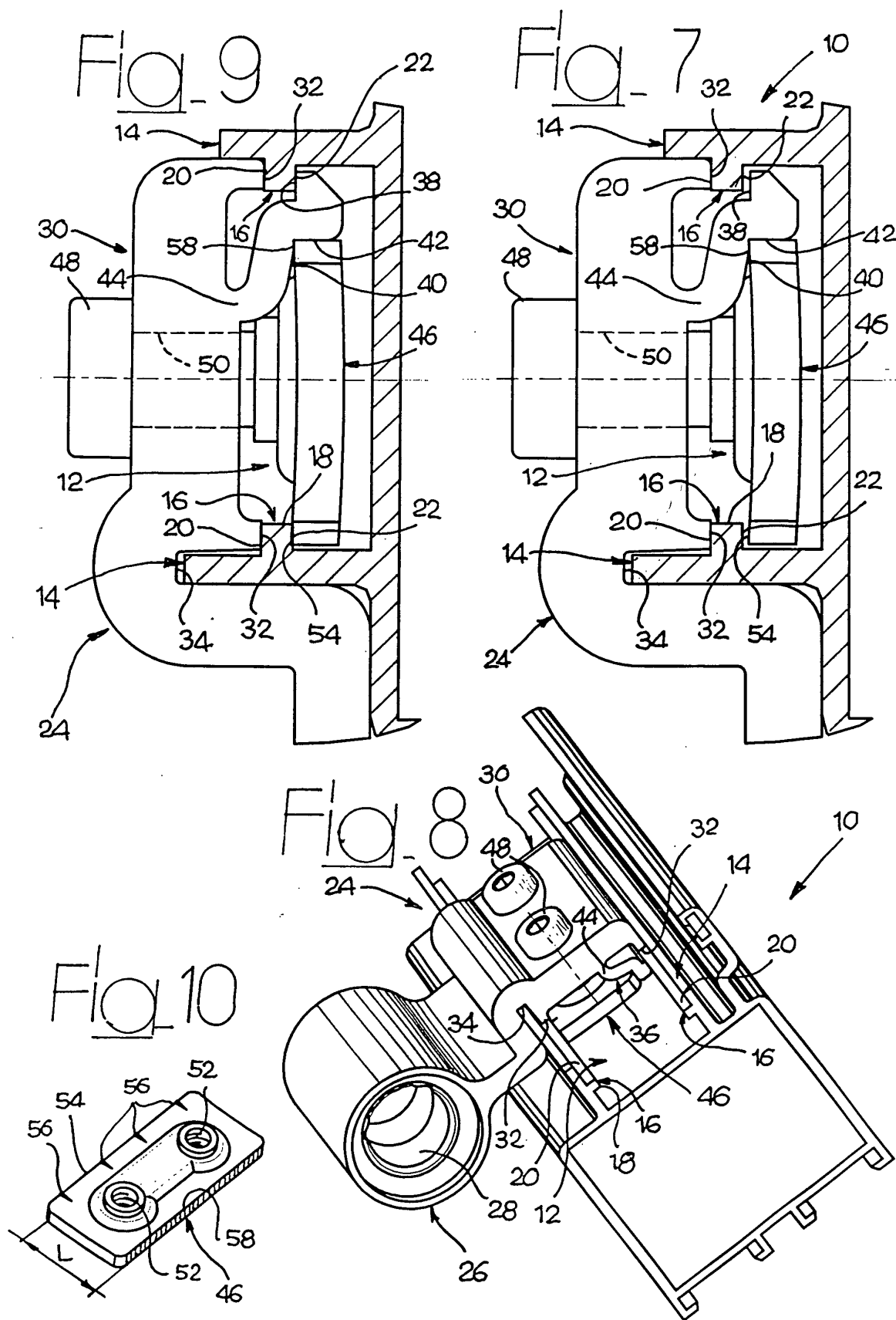




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EUROPEAN SEARCH REPORT

Application Number
EP 02 02 6668

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	CH 541 058 A (KOLLER METALLBAU AG) 31 August 1973 (1973-08-31)	1,2,6,7	E05D5/02
Y	* column 1, line 37-44 *	3	
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Y	EP 0 659 967 A (ERRETI SRL) 28 June 1995 (1995-06-28)	3	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		5 March 2003	Mund, A
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			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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