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(54) Striking plate device capable of receiving one or more locking members of a lock

(57) A striking plate device, capable of receiving one or more locking members of a lock and designed to be fitted on a fixed part (18) of a structure to be locked by means of the lock, consists of at least one element (3) having one or more apertures (12) which can receive the locking member or members of the lock, and means (11, 11', 4, 4') of adjusting the element on the fixed part (18) of the structure to provide a fixed position aligned with the locking member or members (17) of the lock. The striking plate device (1) is easily adapted to structures of different dimensions and also provides easy adjustment and a saving of time during fitting.

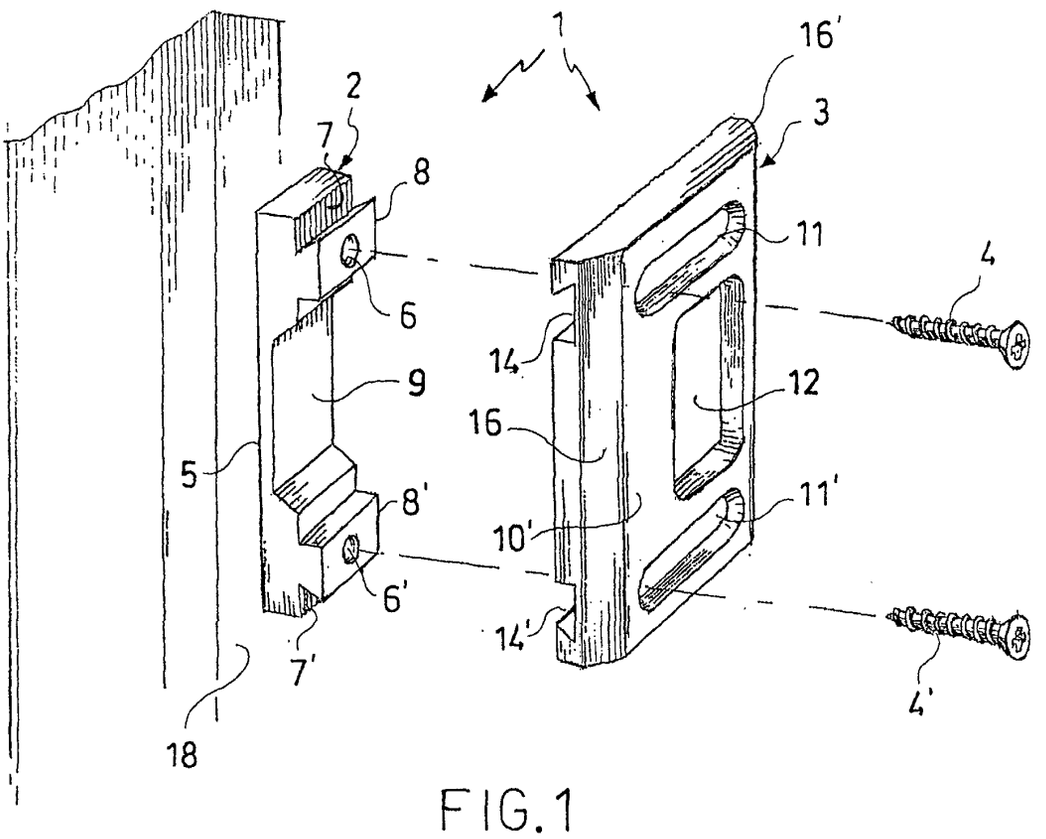

FIG.1

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Description

[0001] The present invention relates to a striking plate device capable of receiving one or more locking members of a lock.

[0002] There are known striking plates made from metal or from rigid plastic material, for use in conjunction with locks of the spring-latch and/or bolt type, particularly for locking doors in which the striking plate is fitted on the fixed part of the door, while the lock is fitted on the moving part of the door. The striking plate normally has an aperture which can receive the spring-latch or the bolt of the lock, according to the type of lock, or two apertures, one of which can receive the spring-latch of the lock while the other can receive the bolt.

[0003] It should be noted that there is a great variety of sizes of doors to which striking plates are to be applied, and therefore the jambs on which the striking plates are to be fitted vary significantly in their width. Furthermore, there can be differences between two doors of equal dimensions, because of various factors, for example the variations in profile of the fixed part of the door, or the imperfections of mechanical machining or other.

[0004] Because of all these considerations, it is necessary to have a large number of striking plates of different sizes, and it is also necessary to continually readjust the position of the striking plate on the jamb during fitting, to eliminate excessive clearances or stresses in the door.

[0005] The object of the present invention is to propose a striking plate device which enables the aforesaid drawbacks to be overcome.

[0006] This object is achieved by means of a striking plate device capable of receiving one or more locking members of a lock and designed to be fitted on a fixed part of a structure to be locked by means of the lock, characterized in that it comprises at least one element having one or more apertures which can receive the locking member or members of the lock, and means of adjusting the element on the fixed part of the structure to provide a fixed position aligned with the locking member or members of the lock.

[0007] To enable the invention to be understood more clearly, a description is given below of an embodiment of the invention, provided by way of example and without restrictive intent, in which

Figure 1 is an exploded perspective view of a striking plate device according to the invention during its fitting to a jamb of a door;
Figure 2 is a perspective view of the aforesaid device when fitted;
Figure 3 is a front view of a fixed element of the aforesaid striking plate device according to the invention;
Figure 4 is a view from above of the fixed element of Figure 3;
Figure 5 is a section through the fixed element along the line V-V of Figure 3;
Figures 6 and 7 are two views, front and rear respectively, of an adjustable element of the aforesaid striking plate device according to the invention;
Figure 8 is a partial section through the said adjustable element along the line VIII-VIII of Figure 6;
Figure 9 is a section through the said adjustable element along the line IX-IX of Figure 6;
Figure 10 is a front view of the aforesaid striking plate device fitted on the jamb of a door in a predetermined adjustment position;
Figure 11 shows, in a sectional plan view, the striking plate device of Figure 10 engaged with a lock;
Figure 12 is a front view of the aforesaid striking plate device fitted on the jamb of a door in a further predetermined adjustment position;
Figure 13 shows, in a sectional plan view, the striking plate device in the position of Figure 12, engaged with another lock.

[0008] With reference to Figures 1 and 2, the illustrated striking plate device, indicated in a general way by 1, consists of a fixed or base element, indicated by 2, and an adjustable device or stop, indicated by 3. With particular reference to Figures 3, 4 and 5, the base 2 is an essentially rectangular plate with two longitudinal sides much longer than the two transverse sides. The base 2 comprises an inner face 5 and an outer face 5'. Two projections 8 and 8', with undercuts on their outer sides, are formed at short distances from the two transverse sides of the base 2, and extend from the outer face 5'. Two milled areas 7 and 7' are formed between the projections 8 and 8' and the corresponding transverse edges of the base 2. Two through holes 6 and 6' for housing fixing screws are provided in the projecting areas 8 and 8'. The said through holes are countersunk on the outer surface 5' of the base 2. The central part of the base also has a recess 9. Figure 4 shows in section the form of the milled area 7 with fine teeth.

[0009] With reference to Figures 6, 7, 8 and 9, the stop 3 is an elongate plate, of essentially rectangular shape, with two essentially parallel narrow or transverse edges, two essentially parallel longitudinal edges, an outer face 10' and an inner face 10. The outer face 10' of the stop 3, shown in Figure 6, forms the visible surface of the striking plate device 1 when it is fitted on a fixed structure, for example the jamb of a door. As in Figures 1 and 2, the stop 3 has two slots 11 and 11', countersunk on the outer face 10', which extend parallel to each other at short distances from the two transverse edges of the stop 3. A rectangular aperture 12 is located halfway between the said transverse edges and is displaced towards one of the elongate edges of the stop 3. In this specific example, the aperture 12 has the shape of an elongate rectangle, in which the two longitudinal sides act as a stop device for the locking member, for example a spring-latch which springs into the aperture 12. Addi-

tionally, as shown in Figure 6, the corners of this aperture 12 are rounded. Each of the two longitudinal edges of the stop 3 has a chamfer 16 and 16' on its outer surface 10'.

[0010] Figure 7 shows the inner face 10 of the stop 3. Two channels 14 and 14' are cut in this inner face 10 at short distances from the transverse edges of the stop 3. These channels 14 and 14' extend parallel to each other and to the transverse edges, opening towards one of the longitudinal sides of the stop 3. The slots 11, 11', described previously with reference to Figure 6, are located in the bases the channels 14, 14' respectively. Two milled areas 13 and 13' are also formed between the channels 14, 14' and the corresponding transverse edges of the stop 3. A void 15 of rectangular shape is formed on the inner face 10 of the stop 3 in the area between the longitudinal edge farther from the aperture 12 and the aperture 12 itself.

[0011] As shown, for example, in Figure 8, the slots 11, 11' are countersunk on the surface 10' of the stop 3. In this specific example, the channels 14, 14', which both have undercuts on their outer sides, have trapezoidal cross-sections.

[0012] Figure 9 shows a section through the tapers 16, 16' on the outer face 10' at the lateral edges of the stop 3, together with the void 15 and the aperture 12. The aperture 12 is also countersunk on the outer face 10' of the stop 3.

[0013] The fitting and the operation of the striking plate device 1 comprising the base 2 and the stop 3 are described below with reference to Figures 1 and 2.

[0014] After one or more holes have been made in the fixed part of the structure to be locked, for example the jamb 18 of a door, the stop 3 is connected to the base 2 by inserting the projections 8, 8' into the guide channels 14, 14'. The trapezoidal engagement between the said projections 8, 8' present on the outer face 5' of the base 2 and the guide channels 14, 14' present on the inner face 10 of the stop 3 creates an adjustable connection between the base 2 and the stop 3. In this configuration it is possible to insert fixing screws 4, 4' from the outer face 10' of the stop 3 through the slots 11, 11' into the through holes 6, 6' of the base 2, in such a way that the ends of the shanks of the screws 4, 4' project from the inner face 5 of the base 2. When the striking plate device, prepared in this way, is placed with the inner face 5 of the base 2 against the jamb 18 of the door, the ends of the fixing screws 4, 4' are inserted into the holes present in the jamb 18 and are screwed in, but not yet tightened. The base 2 of the striking plate 1 is therefore fixed, while the stop 3 remains adjustable in the direction of extension of the slots 11, 11' and is therefore adaptable to the specific position of the lock. The stop 3 is then pushed into its desired position, in which the aperture 12 corresponds to the stop position of the spring-latch or the bolt 17 of the lock, as shown for example in figures 11 and 13. When the fixing screws 4, 4' are tightened, the inner face 10 of the stop 3 is pushed against the outer face 5' of the base 2 and the milled areas 7, 7' of the base 2 engage with the corresponding milled areas 13, 13' of the stop 3. Further movement of the stop 3 is thus prevented.

[0015] The slots 11, 11' are advantageously countersunk so that they can fully accommodate the heads of the said fixing screws 4 and 4'. This prevents any interference with the operation of a door due to the heads of fixing screws projecting from the face 10' of the stop 3.

[0016] During the closing of the structure, the inclined side of the spring-latch 17 strikes the longitudinal edge of the stop 3 and is pushed towards the inside of the lock, while it slides over the said longitudinal edge. The said sliding of the spring-latch 17 over the edge of the stop 3 is facilitated by the tapers 16, 16'. Having passed over the thickness of the tapered edge, the spring-latch 17 springs into the aperture 12 of the stop 3 and is checked between the two longitudinal edges of the aperture 12. In the case of a bolt, the door is first closed, after which the bolt 17 is inserted into the aperture 12 of the stop 3. The recess 9, provided on the outer face 5' of the base 2, decreases the overall dimensions of the base 2 in this area and thus ensures a sufficiently deep insertion of the locking members 17 into the apertures 12 present in the stop 3.

[0017] When the structure, for example a door, is locked, any force pushing against the said door is transmitted by the locking members 17 to the inner longitudinal edge of the aperture 12 of the stop 3. The said pushing force is transmitted from the stop 3 through the milled areas 7, 7' and 13, 13' to the base 2, and from there to the jamb 18 of the door through the fixing screws 4, 4'. The said milled areas prevent an undesired movement of the spring-latch stop position, in other words of the aperture 12, with respect to the base 2 and to the jamb 18 of the door.

[0018] Figure 10 shows the striking plate device 1 in a possible fitted configuration. The screws 4 and 4' are inserted into the slots 11, 11' of the stop 3 and into the through holes 6, 6' of the base 2, and are screwed into corresponding internally threaded holes of a door jamb 18. Figure 11 shows in horizontal section the jamb 18 with the striking plate device 1 fitted according to Figure 10. The spring-latch 17 of a lock is inserted into the aperture 12 and checked between the two inner longitudinal sides of the aperture. In Figures 10 and 11, the base 2 has its wide longitudinal edge, recognizable by the void 15, pointing towards the direction of opening of the door. Consequently, the aperture 12 and the check position of the spring-latch 17 are displaced towards the direction of closing of the door.

[0019] Figures 12 and 13 show a second fitted configuration of the striking plate device 1, in which the position of the spring-latch 17 is different from the situation in Figure 11; in other words, the spring-latch is displaced in the direction of opening of the door. When the stop 3 is rotated through 180° in its plane and fitted on the base 2 in such a way that the wide edge of the base 3 points

towards the direction of closing of the door, the aperture 12 is displaced in the direction of opening of the door. In this particular configuration, the striking plate device 1 is adapted to the position of the lock and the spring-latch 17 in Figure 13, which is changed from that in Figure 11, without any further adjustment by means of the slots 11, 11'.

[0020] In one particular embodiment, the individual elements of the striking plate device according to the example are formed from nylon by press-moulding.

[0021] The striking plate device 1 has numerous advantages.

[0022] Because of the adjustable stop 3, the device 1 can be used with jambs 18 having different widths and with locks having their locking members 17 located in different positions. Because the base 2 is relatively thin, the striking plate device 1 is also easily adapted to doors with profiled frames. In order to compensate for additional clearances between the door and jamb, it is possible to use additional washers or shims between the base 2 of the device 1 and the structure, without adversely affecting the securing of the stop 3 in position. This all leads to a drastic reduction in fitting time and consequently a reduction of cost. In addition to the saving of time and money, the striking plate device according to the invention allows unusually precise adjustment of the stop position of the locking members.

[0023] Clearly, variants of what has been described and illustrated above, and/or additions thereto, can be provided without departure from the scope of the invention.

[0024] For example, it is possible for the striking plate device to comprise only one element, namely the one which is adjustable by means of the slots 11, 11', which is screwed directly to the jamb 18 of the door. In a further embodiment, the said base 2 or individual characteristics thereof can be formed directly from the fixed part 18 of the structure to be locked. In a further embodiment, the said stop 3 can have more than one aperture for receiving the locking members 17. The said apertures 12 can have shapes different from rectangles, and in particular they can be circular, for pin bolts. Clearly, in a striking plate device in which a plurality of apertures 12 are provided, the said apertures 12 can be shaped differently from each other. According to a further embodiment, a single aperture 12 is capable of receiving more than one locking member.

[0025] The connection between the projections 8, 8' and the guide channels 14, 14' can logically be inverted, in other words projections can be provided on the inner face 10 of the stop 3 and corresponding guide channels of complementary shape can be provided on the outer face 5' of the base 2.

[0026] The striking plate device 1 according to the present invention can be made from any type of material capable of withstanding the mechanical stresses during use, for example steel, aluminium, brass or synthetic material. The use of nylon and the forming of the individual elements of the striking plate device by press-moulding have been shown to be particularly advantageous.

[0027] According to a further embodiment, the base 2 has a group of internally threaded holes to receive the fixing screws of the stop 3 and a further group of through holes for fixing the base 2 to the structure. In this case, the through holes in the base 2 are advantageously countersunk to receive the heads of the fixing screws. The said through holes in the base 2 can be of any shape, and in particular they can be slots which enable the position of the base 2 to be adjusted on the fixed part of the structure. Advantageously, these slots are orientated perpendicularly to each other, enabling the base 2 to be fixed to a structure with pre-existing holes having different spacings and alignments.

[0028] The projections 8, 8' and the guide channels 14, 14' can form different types of connection between the base 2 and the stop 3 of the striking plate device. An undercut or dovetail connection, as shown in Figure 1 and 2, allows the stop 3 to be adjusted only in the direction of the slots 14, 14'. In one embodiment, the said connection is formed with a clearance such that it permits a rotational adjustment, albeit a limited one, in the plane of the stop 3.

[0029] A further embodiment of the present invention omits the said projections 8, 8' and the said guide channels 14, 14' completely. Their guiding and adjusting function is provided exclusively by the fixing screws 4, 4' and the slots 11, 11'.

[0030] The said screws 4 and 4' can be ordinary screws, or self-tapping screws, for use with timber, aluminium, steel or synthetic frames, for example.

[0031] Evidently, a person skilled in the art can, in order to meet contingent and specific requirements, make further modifications and variations to the striking plate device according to the present invention, all such modifications and variations falling within the scope of protection of the invention, as defined by the following claims.

Claims

1. Striking plate device capable of receiving one or more locking members (17) of a lock and designed to be fitted on a fixed part (18) of a structure to be locked by means of the lock, **characterized in that** it comprises at least one element (3) having one or more apertures (12) which can receive the locking member or members (17) of the lock, and means (11, 11', 4, 4') for adjusting the element on the fixed part (18) of the structure to provide a fixed position aligned with the locking member or members (17) of the lock.

2. Device according to Claim 1, comprising at least one fixed element (2) which can be fixed to the fixed

part of the structure (18), and a further element (3) which is connected adjustably to the fixed element (2).

3. Device according to Claim 1 or 2, in which the adjustable element (3) is connected to the fixed element (2) by means of at least one slot (11, 11') present in the adjustable element (3), and at least one fixing screw (4, 4').

4. Device according to Claim 3, in which the said adjustable element (3) has two parallel slots (11, 11') located on its two opposite ends.

5. Device according to Claim 4, in which the said fixed element (2) has through holes (6, 6') at positions corresponding to the slots (11, 11') present in the adjustable element (3), and in which the said fixing screws (4, 4') inserted in the slots (11, 11') of the adjustable element (3) pass through the said through holes (6, 6') of the fixed element (2) and are screwed into holes provided in the fixed part (18) of the structure to be locked.

6. Device according to any one of Claims 2 to 5, in which the fixed element (2) has one or more projections (8, 8') on one of its faces and the adjustable element (3) has on one of its faces the same number of guide channels (14, 14'), having profiles complementary to those of the said projections (8, 8'), the said projections (8, 8') being capable of engaging in the said guide channels (14, 14') to form a sliding connection between the said fixed element (2) and the said adjustable element (3).

7. Device according to Claim 6, in which the said engagement between the said projections (8, 8') and the said channels (14, 14') is an engagement of the trapezoidal profile type.

8. Device according to any one of Claims 2 to 7, in which the fixed element (2) has, on its face opposite the face in contact with the fixed part (18) of the structure, at least one milled area (7, 7') coming into contact with at least one milled area (13, 13') on the face of the adjustable element (3) which is in contact with the fixed element (2).

9. Device according to any one of Claims 2, 4, 6, 7 and 8, in which the fixed element (2) has at least two through holes for receiving the screws for fixing the said fixed element (2) to the fixed part (18) of the structure, and at least two further internally threaded holes for receiving the fixing screws of the adjustable element (3).

10. Device according to Claim 9, in which the said through holes for receiving the screws for fixing the fixed element (2) to the fixed part (18) of the structure are countersunk in such a way that the heads of these screws are completely accommodated.

11. Device according to Claim 10, in which at least one of the through holes capable of receiving the screws for fixing the fixed element (2) to the fixed part (18) of the structure is a slot.

12. Device according to Claim 11, in which the said holes for receiving the fixing screws are two slots which extend in directions essentially perpendicular to each other.

13. Device according to any one of Claims 2 to 12, in which the said fixed element (2) has one or more recesses (9) at the possible positions of the locking members (17).

14. Device according to Claim 2, in which the said adjustable element (3) is a plate with two essentially parallel edges.

15. Device according to Claim 14, in which at least one of the said edges is tapered on the surface on which the locking members (17) slide during locking.

16. Device according to any one of Claims 2 to 15, in which at least one of the said apertures (12) capable of receiving the locking members (17) is of essentially rectangular shape.

17. Device according to any one of Claims 2 to 16, in which at least one of the said apertures (12) capable of receiving the locking members (17) is of essentially circular shape.

18. Device according to Claims 5, 7, 15 and 16, in which the said fixed element (2) is an elongate plate and the said milled areas (7, 7') are located on the two opposite narrow sides of the said elongate plate,

the said projections (8, 8') with trapezoidal profiles are two in number and are located next to the said milled areas (7, 7') on the located on the two opposite narrow sides of the said fixed element (2),

the said two through holes (6, 6') are located, respectively, in the two projections (8, 8') with trapezoidal profile,

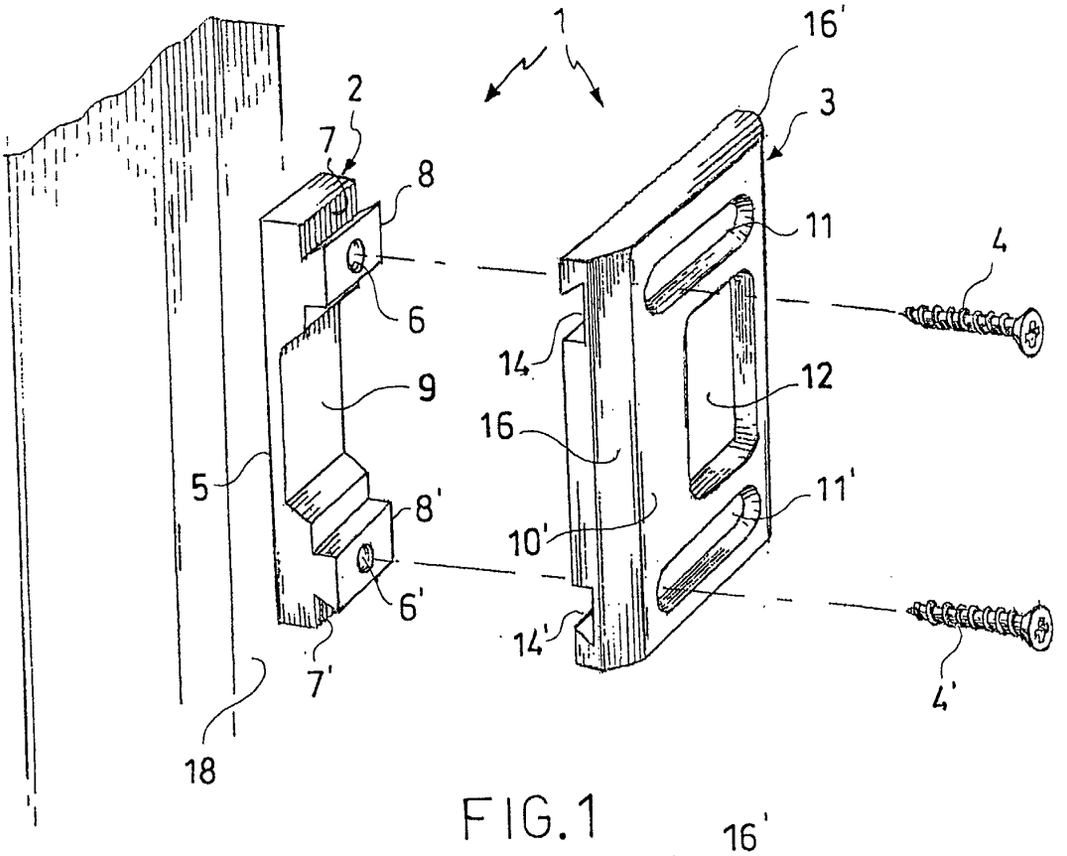
the said adjustable element (3) is an elongate plate,

the said guide channels (14, 14') are parallel, located on the opposite narrow edges and open towards one of the long edges of the adjustable element (3),

the said slots (11, 11') extend along the bases of the said guide channels (14, 14').

19. Device according to any one of the preceding claims, in which the said guide channels (14, 14') are countersunk and completely accommodate the heads of the fixing screws (4, 4').

20. Device according to any one of the preceding claims, made from nylon by press-moulding.


1
16'
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3
7
8
11
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6
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12
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16
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11'
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14'
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4'
18

FIG.1

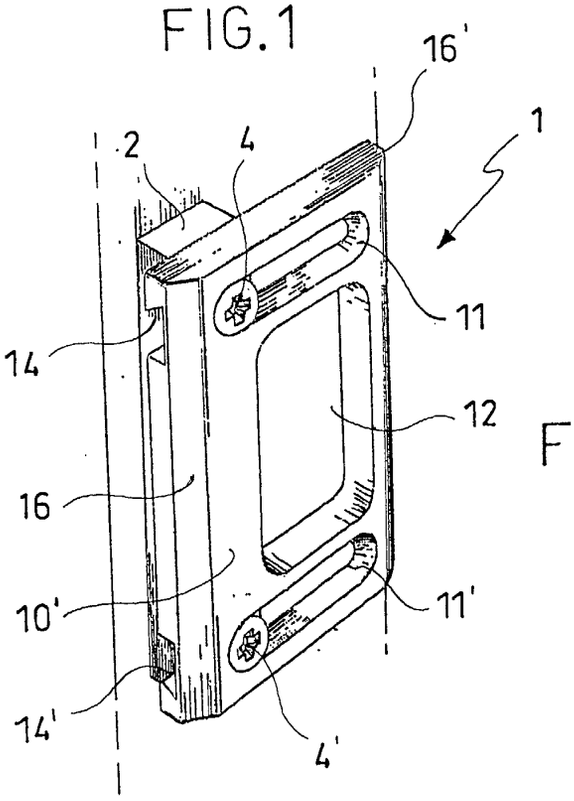
16'
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FIG.2

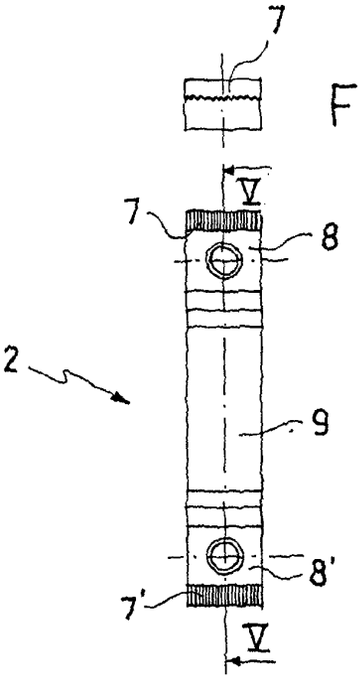

FIG.4

FIG.3

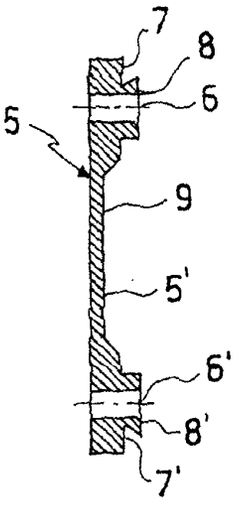

FIG.5

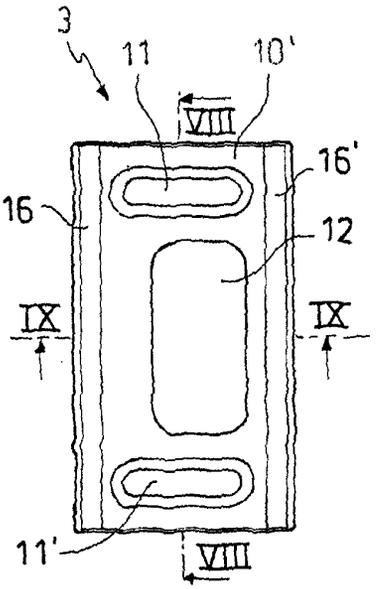

FIG.6

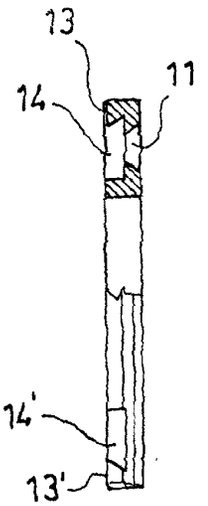

FIG.8

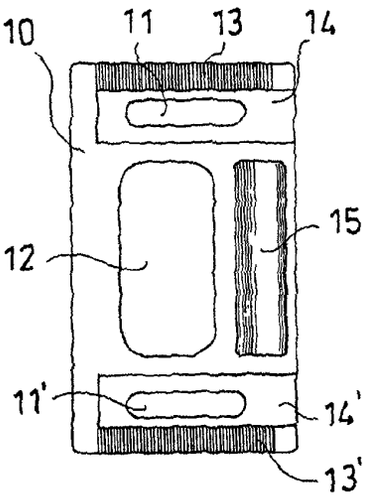

FIG.7

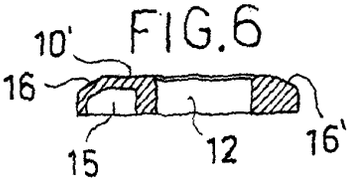

FIG.9

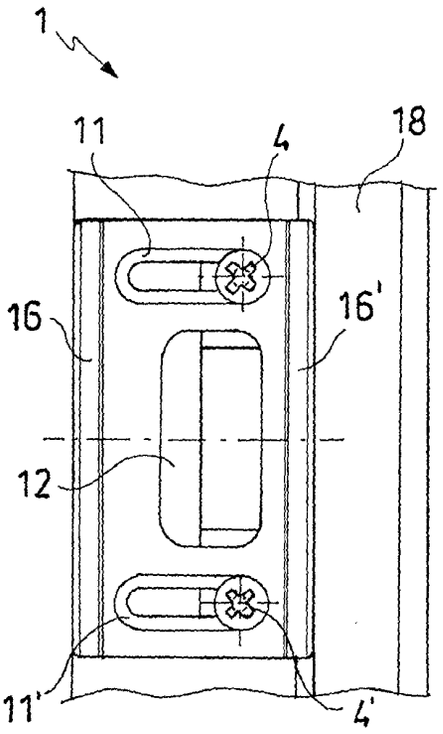

FIG.10

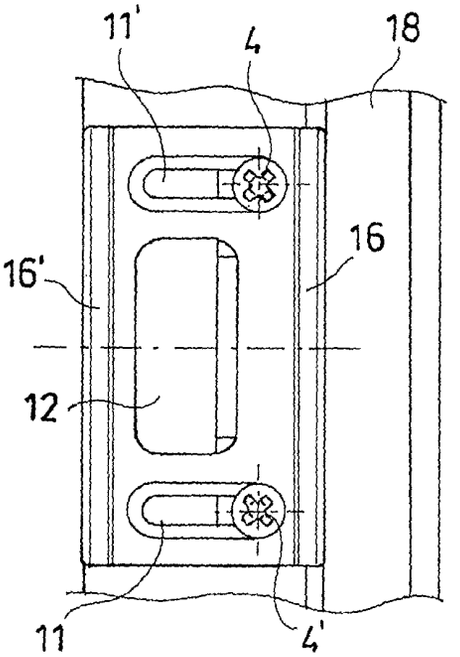

FIG.12

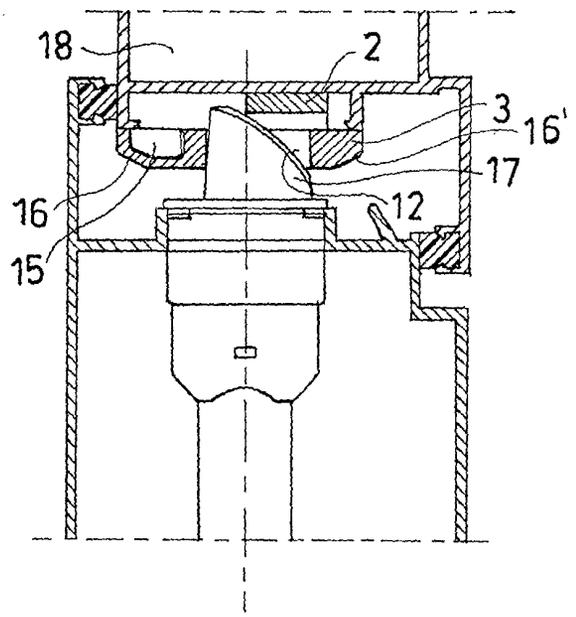

FIG.11

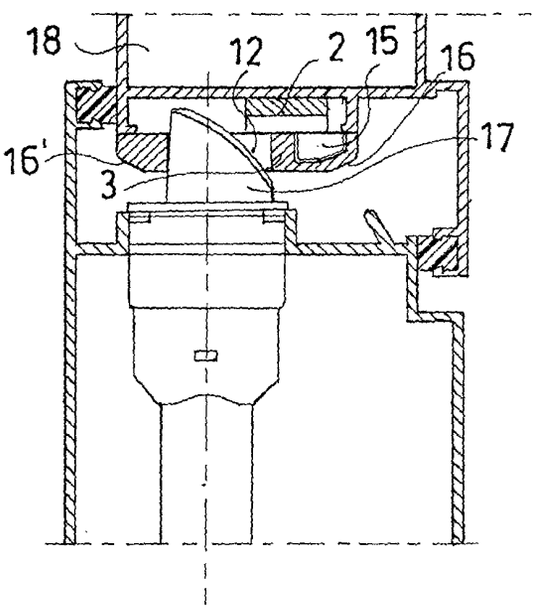

FIG.13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0281

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.7)
X	DE 92 16 214 U (CARL FUHR GMBH & CO) 7 April 1994 (1994-04-07) * the whole document *	1-4,6, 8-11,13, 16,17	E05B15/02
X	EP 0 597 484 A (KARL FLIETHER GMBH & CO .) 18 May 1994 (1994-05-18) * the whole document *	1-5,8, 13,14, 16,17	
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A	US 2 401 854 A (BERRY, JR.) 11 June 1946 (1946-06-11) * figure 1 *	12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17 September 2001	Westin, K

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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17-09-2001

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