

(19)



(11)

**EP 1 988 237 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:

**05.11.2008 Bulletin 2008/45**

(51) Int Cl.:

**E05B 17/00** (2006.01)

**E05B 17/20** (2006.01)

**E05B 63/12** (2006.01)

**E05B 15/02** (2006.01)

(21) Application number: **08155299.4**

(22) Date of filing: **28.04.2008**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT  
RO SE SI SK TR**

Designated Extension States:

**AL BA MK RS**

(30) Priority: **27.04.2007 NL 1033779**

(71) Applicant: **Lips Nederland B.V.  
4941 SK Raamsdonksveer (NL)**

(72) Inventors:

- **Praet, Petrus Johannes Laurentius  
3311 AA Dordrecht (NL)**
- **Schoen, Niels  
3063 JH Rotterdam (NL)**

(74) Representative: **Bras, Pieter**

**Octrooibureau Vriesendorp & Gaade B.V.  
Dr. Kuiperstraat 6  
2514 BB Den Haag (NL)**

(54) **Locking latch and strike case with locking means**

(57) Lock assembly comprising a lock (10) and a strike case (100) for the lock, wherein the lock comprises a lock case (11) with a front plate (12) and a latch (20) that is movable with respect to the front plate in a first direction of movement (8), and the strike case comprises an accommodation space having a first access opening for accommodating the latch in a closing position of the latch, wherein the latch is provided with a first closing surface and the accommodation space is bounded by a second closing surface which in the closing position co-operate together in a substantially abutting manner,

wherein the latch and the strike case are provided with locking means comprising a locking chamber having a second access opening in at least a portion of the first or second closing surface, and a locking member having an extremity that is positioned to enter the locking chamber in the closing position of the latch, wherein the locking means are adapted for bringing the extremity of the locking member into the locking chamber in response to a pressure force exerted by the latch on the strike case substantially transverse to the first closing surface.

**EP 1 988 237 A1**

## Description

### BACKGROUND OF THE INVENTION

**[0001]** The invention relates to a lock assembly comprising a lock and a strike case for the lock, wherein the lock comprises a lock case with a front plate and a latch that is movable with respect to the front plate, and the strike case comprises an accommodation space for accommodating the latch.

**[0002]** Such lock assemblies may for instance be designed as a rim lock assembly for a door, wherein the lock and the strike case are attached to the door and a jamb of the door casing, respectively. The jamb can then also serve as rebate for a window extending alongside the door. In that case the jamb has a relatively slim design. When for instance a burglar pushes hard against the door, it cannot be ruled out that the slim jamb twists at the location of the strike case, as a result of which the distance between the strike case and the lock is widened to such an extent that the latch in its closing position leaves the accommodation space as yet. The burglar then has free access.

**[0003]** It is an object of the invention to provide a lock assembly that may be particularly burglary-resistant when it locks with respect to a relatively slim door jamb.

**[0004]** It is an object of the invention to provide a reliably locking lock assembly.

### SUMMARY OF THE INVENTION

**[0005]** The invention, according to one aspect, provides a lock assembly comprising a lock and a strike case for the lock, wherein the lock comprises a lock case with a front plate and a latch that is movable with respect to the front plate in a first direction of movement, and the strike case comprises an accommodation space having a first access opening for accommodating the latch in a closing position of the latch, wherein the latch is provided with a first closing surface and the accommodation space is bounded by a second closing surface which in the closing position cooperate together in a substantially abutting manner, wherein the latch and the strike case are provided with locking means comprising a locking chamber having a second access opening in at least a portion of the first or second closing surface, and a locking member having an extremity that is positioned to enter the locking chamber in the closing position of the latch, wherein the locking means are adapted for bringing the extremity of the locking member into the locking chamber substantially transverse to the first closing surface in response to a pressure force exerted by the latch on the strike case substantially transverse to the first closing surface.

**[0006]** By exerting the pressure force the extremity of the locking member may enter into the locking chamber to ensure a form-closed relation between the latch and the strike case. The latch retracting out of the first access opening, for instance when a burglar pushes against the

door, can be counteracted. In case the lock assembly locks with respect to a relatively slim door jamb, the door jamb may tend to bend substantially along with the latch, instead of away therefrom.

**[0007]** In one embodiment the locking means are adapted for bringing the extremity of the locking member into the locking chamber in response to exceeding a threshold value for the predetermined pressure force. The locking means can then only become active when the pressure force exceeds the regular forces that the cooperating first and second closing surface exert on each other for keeping a door closed.

**[0008]** In one development thereof the first and/or second closing surface is defined on a wall portion of the latch and the strike case, respectively, which via a connection with a predetermined failure section is connected to the locking member. The connection with predetermined failure section then substantially defines the above-mentioned threshold value.

**[0009]** In addition the wall portion can be connected to the latch and strike case, respectively, at a distance from the connection with the pre-determined failure section, wherein the wall portion is adapted for bending out away from the extremity by exerting the pressure force on the wall portion. The locking member can then with its extremity move apart from the first or second wall portion to enter the locking chamber.

**[0010]** The connection with the pre-determined failure section or a portion thereof can thus contribute to a self-locking form-closed relation between the latch and the strike case when the connection with predetermined failure section is adapted for leaving a first hook edge on the locking member.

**[0011]** In a simple embodiment the locking member substantially has a block shape, wherein the locking member preferably has an elongated block shape, wherein the extremity in its longitudinal direction extends substantially parallel to the first or second surface and substantially transverse to the direction of movement.

**[0012]** In one embodiment an extremity of the locking member defines a continuation of the first or second closing surface. In that way the latch with the first closing surface can then smoothly move in an out of the accommodation space guided by the second closing surface.

**[0013]** In one simple embodiment the locking member is securely connected to the latch or the strike case.

**[0014]** In one development of the locking chamber at least a portion of the second access opening is bounded by a transition edge from the first or second closing surface to an internal inner surface of the locking chamber.

**[0015]** The transition edge may over a large part of its length engage onto the locking member when the transition edge extends substantially transverse to the first direction of movement. Preferably the transition edge extends substantially straight.

**[0016]** In one embodiment the internal inner surface and the first or second closing surface at the location of the transition edge include an angle smaller than or

equalling 90 degrees for defining a second hook edge. The transition edge may then contribute to a self-locking form-closed relation between the latch and the strike case.

**[0017]** Alternatively formulated a part of the internal inner surface adjacent to the transition edge defines a hook surface for engagement onto the locking member, wherein the hook surface preferably is substantially straight. The hook surface can then face towards a bottom area of the internal inner surface.

**[0018]** In one embodiment the second access opening has a rectangular contour or outline.

**[0019]** In one embodiment the second access opening is situated entirely within the first or second closing surface. In that way the latch with the first closing surface can then smoothly move in and out of the accommodation space guided by the second closing surface, without or with only slight hindrance coming from the locking chamber.

**[0020]** In one development of the lock assembly the latch is provided with the locking chamber and the strike case is provided with the locking member.

**[0021]** In one embodiment thereof the first accommodation opening has a rectangular contour or outline, wherein the extremity of the locking member defines a part of a circumferential edge portion of the first access opening, which circumferential edge portion extends parallel to the first closing surface.

**[0022]** In one embodiment the latch is movable between a position retracted in the case, and an extended intermediate position in which the latch may abut the strike case in order to subsequently enter the accommodation space, and an ultimate closing position in which the latch projects further than it does in the intermediate position to block getting out of the accommodation space, wherein the locking chamber in the ultimate closing position is situated entirely outside of the front plate of the lock case. Due to the location of the locking chamber outside of the front plate it is able to accommodate the locking member over a large range when in the ultimate closing position. The lock assembly can then be used with various widths of the slit between a door leaf and a door casing.

**[0023]** In addition the locking chamber in the intermediate position can be situated entirely within the lock case.

**[0024]** In one embodiment in the first direction of movement the latch can only be moved in a translatory manner with respect to the front plate, wherein the first direction of movement preferably is oriented substantially transverse to the front plate.

**[0025]** In one development the lock is designed as a rim lock.

**[0026]** The aspects and measures described in this description and the claims of the application and/or shown in the drawings of this application, may where possible also be used individually. Said individual aspects may be the subject of divisional patent applications relating thereto. This particularly applies to the measures

and aspects described per se in the sub claims.

## SHORT DESCRIPTION OF THE DRAWINGS

**[0027]** The invention will be elucidated on the basis of a number of exemplary embodiments shown in the attached drawings, in which:

Figure 1 shows a front view of a door and a door jamb provided with a rim lock and a strike case, respectively, according to the invention;

Figure 2 shows a top view of the rim lock and the strike case according to figure 1, wherein some parts have been cut away according to the line II-II in figure 1;

Figure 3 shows the top view of the rim lock and the strike case, in forced condition of the door and the strike case;

Figure 4A shows an isometric view of the strike case and a part of the rim lock according to the previous figures, which for the sake of illustration have been placed at a distance from each other;

Figure 4B shows the isometric view of the strike case and the rim lock according to figure 4A, according to the line IVB-IVB in figure 1; and

Figure 5 shows an isometric view of the inside of the strike case according to the previous figures.

## DETAILED DESCRIPTION OF THE DRAWINGS

**[0028]** Figures 1 and 2 show a closed door 1 in a rebate of a door jamb 2. The door jamb 2 supports the edge of a window pane 3 in the façade at the leaf side of the door 1. With its outer surface 4 the door 1 abuts an inner surface 5 of the rebate of the door jamb 2, wherein at the front side of the door 1 a slit 6 has been left open. At the inside the door 1 has been provided with a rim lock 10 according to the invention, which engages onto a strike case 100 according to the invention on the door jamb 2. Due to its shape the slim jamb 2 offers only slight resistance against twisting about its centre line.

**[0029]** The rim lock 10 comprises a metal lock case 11 having a front plate 12 attached to the door 1 by means of screws that are not shown. The front plate 12 is partially placed flush with the front side of the door 1. The rim lock 10 comprises a metal latch 20 which by operating a pull knob 13 in pull direction A can be moved in the same direction of movement B (first direction of movement) with respect to the front plate 12 to come in and out of the strike case 100. The operation of the pull knob 13 can be blocked by means of a mechanism (not shown) in the lock case 11 by inserting a key in the key cylinder 14 and subsequently turning it. In this example the lock

case 11 and the latch 20 have been made of a zinc-aluminium alloy, such as Zamak/Zamak.

**[0030]** The latch 20 and the front part of the lock case are shown in detail in figures 4A and 4B. The latch 20 comprises a closing surface 21 (first closing surface) and a rear surface 23 extending parallel to each other in the direction of movement B, and a run-on surface 22 oriented diagonally to the direction of movement B. By means of the mechanism, the latch 20 can be moved between the shown ultimate position, a position retracted in the case 11, and an intermediate partially extended position in which the transition edge from the rear surface 23 to the run-on surface 22 is at a short distance (a few millimetres at the most) from the front plate 12.

**[0031]** The latch 20 comprises a locking chamber 25 that is bounded by a straight abutment surface 26 positioned recessed within the closing surface 21 and by a hook surface 27 between the closing surface 21 and the abutment surface 26. The closing surface 21 therefore extends with a front section 21 a, two longitudinal sections 21 b and a rear section 21 c about the locking chamber 25, as result of which the latch 20 runs smoothly with respect to the opening in the front plate 12 through which the latch 20 moves.

**[0032]** The abutment surface 26 is oriented diagonally to the direction of movement B, and merges into the rear section 21c of the closing surface 21. In the shown ultimate closing position of the latch 20 the transition extends along or at a short distance (a few millimetres at the most) from the front plate 12 of the rim lock 10. The normal of the hook surface 27 faces the closing surface 26, and is at an acute angle of approximately 80 degrees to the closing surface 21. The acute transition from the hook surface 27 to the front section 21 a of the closing surface 21 defines a straight hook edge 28 (second hook edge) of the latch 20. The hook edge 28 extends transverse to the direction of movement B.

**[0033]** The metal strike case 100 comprises a substantially hollow housing 102 having a front plate 101 attached to door jamb 2. The front plate 101 is partially placed flush with the rebate of the door jamb 2. The strike case 100 comprises a removable cover 103 with which the front side of the housing 102 is covered for decorative purposes. In this example the housing is made of a zinc-aluminium alloy, such as Zamak/Zamak. The cover 103 in this example is made of plastic, such as POM.

**[0034]** The strike case 100 without the cover 103 is shown in detail in figures 4A, 4B and 5. The housing 102 behind the front plate 101 comprises a circumferential edge 105 that is offset to the inside for placing the cover 103, and two recessed screw holes 106 covered by the cover 103. The strike case 100 is secured to the door jamb 2 by means of two screws (not shown) through the screw holes 106 in the front plate 101 and the upper side of the housing 102. The front plate 101 comprises a rectangular opening 110 (first access opening) for accommodation of the latch 20 in the housing 102, and a run-on surface 117 for pushing back the latch 20 prior to

accommodation in the housing 102.

**[0035]** At the inside the housing 102 comprises a support wall 114 which over a straight transition 115 merges into a thinner and as a result less bending-stiff bending wall 113. Due to the material used the surface thereof facing the latch 20 is hard. The support wall 114 and the bending wall 113 define an internal closing surface 112 (second closing surface) of the strike case 100, which internal closing surface 112 extends substantially in the accommodation direction and/or direction of movement B. The inner edge or inner wall 118 of the opening 110 situated at a short distance from the run-on surface 117, comprises a straight hook wall 111 (locking member) that is situated offset to the inside in the plane of the front plate 101. At the free extremity the hook wall 111 is connected to the bending wall 113 by means of an elongated connection with a predetermined failure section 116. The connection with the predetermined failure section 116 is adapted for collapsing when a predetermined threshold value for a force C (figure 3) exerted transverse to the closing surface 112 on the bending wall 113 is exceeded. After collapsing the bending wall 113 will bend out from the transition 115, after which the collapsed half of the connection with predetermined failure section 116 on the hook wall 111 leaves a hook edge (first hook edge) at the extremity of the hook wall 111.

**[0036]** Figure 2 shows the door 1 in the normal closing position, wherein the latch 20 in its ultimate position extends through the rectangular opening 110 in the strike case 100. The closing surfaces 21, 112 abut each other such that the front section 21 a of the closing surface 21 of the latch 20 rests on the centre area of the bending wall 113. When for instance a burglar exerts a great pressure force D on the leaf of the door 1, the front section 21 a exerts a force C exceeding the threshold value on the bending wall 113, as a result of which the connection with predetermined failure section 116 collapses. Subsequently the bending wall 113 bends away due to the force C, as a result of which the door swings slightly in opening direction E and the hook wall 111 enters the locking chamber 25 substantially transverse to the support surface 21 or substantially transverse to the direction of movement B of the latch 20.

**[0037]** When the pressure force D is so great that even the door jamb 2 twists away from the door in direction F so that the slit 6 is widened, the hook surface 27 of the latch 20 will abut the hook edge of the connection with predetermined failure section 116 left on the hook wall 111, as a result of which a form-closed engagement into each other is realised. The hook edge 28 on the latch 20 and the hook edge left behind by the connection with predetermined failure section 116 hook behind each other. Due to this relation a further twisting deformation of the door jamb 2 is counteracted. The latch 20 remains in the strike case 100 despite a possible widening of the slit 6 between the door 1 and the door jamb 2.

**[0038]** The above description is included to illustrate the operation of preferred embodiments of the invention

and not to limit the scope of the invention. Starting from the above explanation many variations that fall within the spirit and scope of the present invention will be evident to an expert. It will for instance be clear that the said latch and the strike case can also be used in mortise locks that have been built in in the door and in the door casing, respectively.

## Claims

1. Lock assembly comprising a lock and a strike case for the lock, wherein the lock comprises a lock case with a front plate and a latch that is movable with respect to the front plate in a first direction of movement, and the strike case comprises an accommodation space having a first access opening for accommodating the latch in a closing position of the latch, wherein the latch is provided with a first closing surface and the accommodation space is bounded by a second closing surface which in the closing position cooperate together in a substantially abutting manner, wherein the latch and the strike case are provided with locking means comprising a locking chamber having a second access opening in at least a portion of the first or second closing surface, and a locking member having an extremity that is positioned to enter the locking chamber in the closing position of the latch, wherein the locking means are adapted for bringing the extremity of the locking member into the locking chamber substantially transverse to the first closing surface in response to a pressure force exerted by the latch on the strike case substantially transverse to the first closing surface.
2. Lock assembly according to claim 1, wherein the locking means are adapted for bringing the extremity of the locking member into the locking chamber in response to exceeding a threshold value for the pressure force.
3. Lock assembly according to claim 1 or 2, wherein the first and/or second closing surface is defined on a wall portion of the latch or the strike case, respectively, which via a connection with a pre-determined failure section is connected to the locking member, wherein, preferably, the wall portion is connected to the latch or strike case, respectively, at a distance from the connection with the pre-determined failure section, wherein the wall portion is adapted for bending out away from the extremity by exerting the pressure force on the wall portion, wherein the connection with the pre-determined failure section preferably is adapted for leaving a first hook edge on the locking member.
4. Lock assembly according to any one of the preceding

claims, wherein the locking member substantially has a block shape, wherein the locking member preferably has an elongated block shape, wherein the extremity in its longitudinal direction extends substantially parallel to the first or second surface and substantially transverse to the direction of movement.

5. Lock assembly according to any one of the preceding claims, wherein an extremity of the locking member defines a continuation of the first or second closing surface.
6. Lock assembly according to any one of the preceding claims, wherein the locking member is securely connected to the latch or the strike case,
7. Lock assembly according to any one of the preceding claims, wherein at least a portion of the second access opening is bounded by a transition edge from the first or second closing surface to an internal inner surface of the locking chamber, wherein the transition edge preferably extends substantially transverse to the first direction of movement.
8. Lock assembly according to claim 7, wherein the transition edge extends substantially straight.
9. Lock assembly according to claim 7 or 8, wherein the internal inner surface and the first or second closing surface at the location of the transition edge include an angle smaller than or equalling 90 degrees for defining a second hook edge.
10. Lock assembly according to claim 7-9, wherein a part of the internal inner surface adjacent to the transition edge defines a hook surface for engagement onto the locking member, wherein the hook surface preferably is substantially straight, wherein the hook surface preferably faces towards a bottom area of the internal inner surface.
11. Lock assembly according to any one of the preceding claims, wherein the second access opening has a rectangular contour or outline.
12. Lock assembly according to any one of the preceding claims, wherein the second access opening is situated entirely within the first or second closing surface.
13. Lock assembly according to any one of the preceding claims, wherein the latch is provided with the locking chamber and the strike case is provided with the locking member, wherein the first accommodation opening preferably has a rectangular contour or outline, wherein the extremity of the locking member defines a part of a circumferential edge portion of the first

access opening, which circumferential edge portion extends parallel to the first closing surface.

14. Lock assembly according to claim 13, wherein the latch is movable between a position retracted in the case, and an extended intermediate position in which the latch may abut the strike case in order to subsequently enter the accommodation space, and an ultimate closing position in which the latch projects further than it does in the intermediate position to block getting out of the accommodation space, wherein the locking chamber in the ultimate closing position is situated entirely outside of the front plate of the lock case, wherein the locking chamber in the intermediate position preferably is situated entirely within the lock case.
15. Lock assembly according to any one of the preceding claims, wherein in the first direction of movement the latch can only be moved in a translatory manner with respect to the front plate, wherein the first direction of movement preferably is oriented substantially transverse to the front plate.

5

10

15

20

25

30

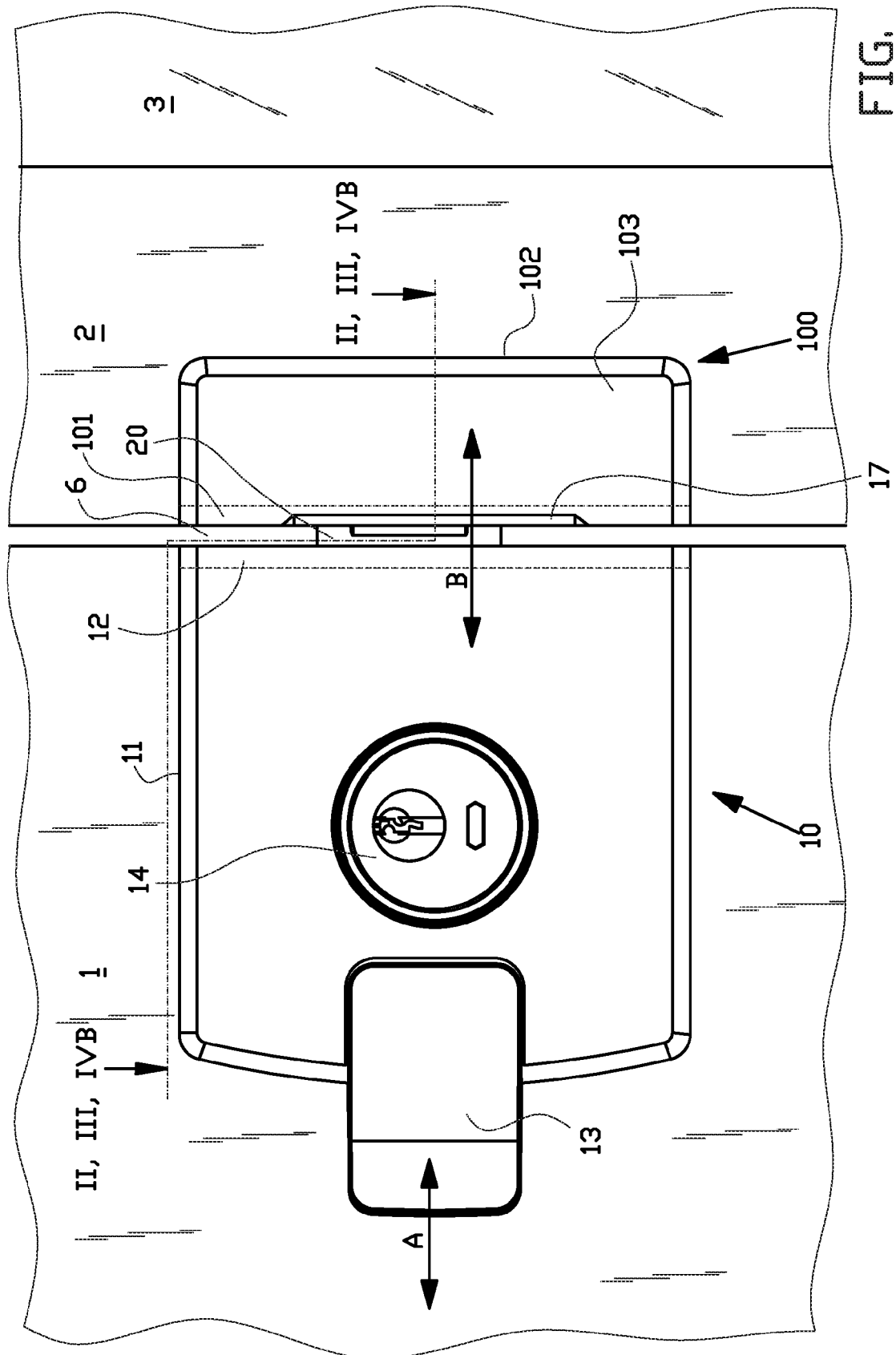
35

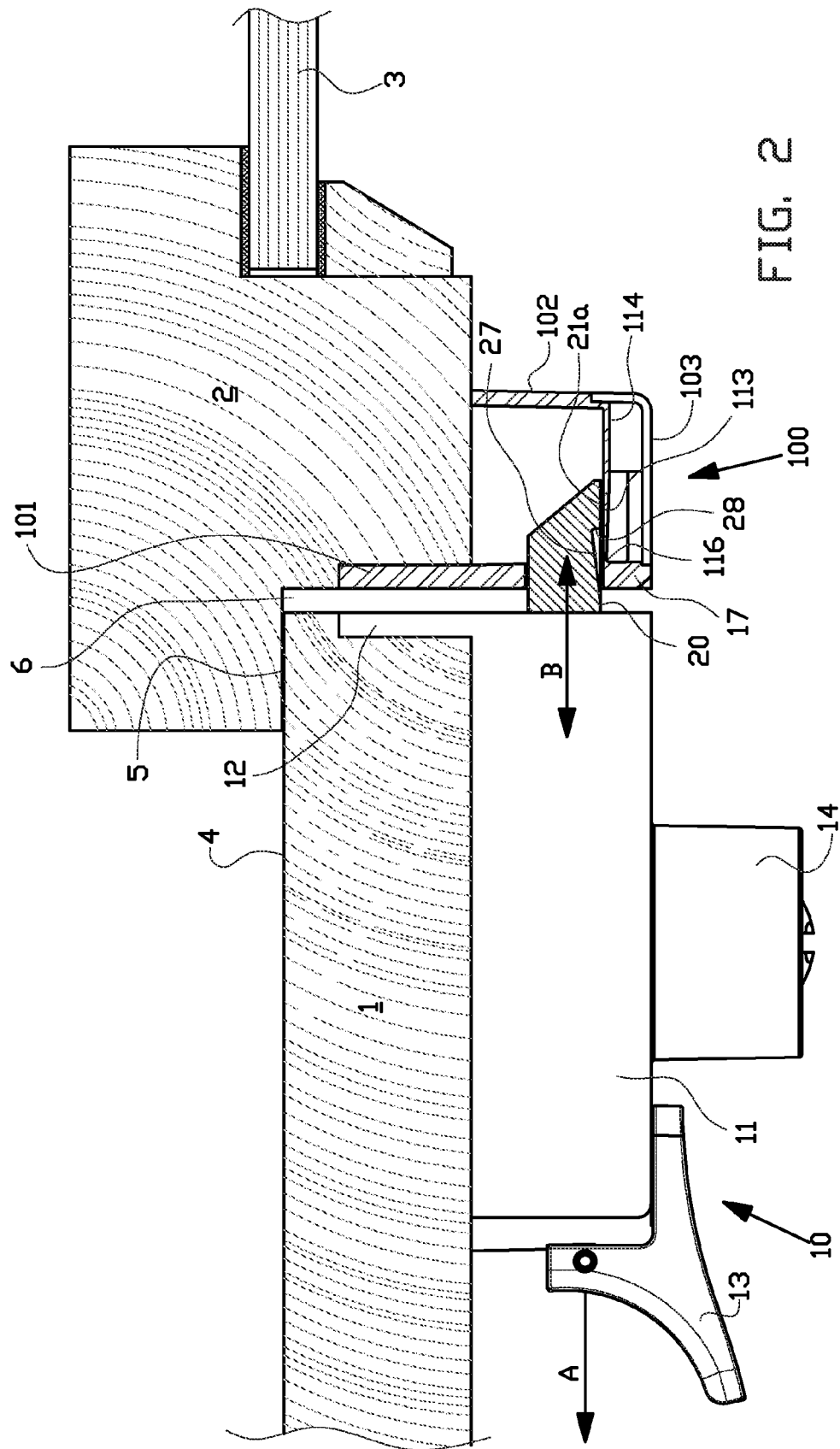
40

45

50

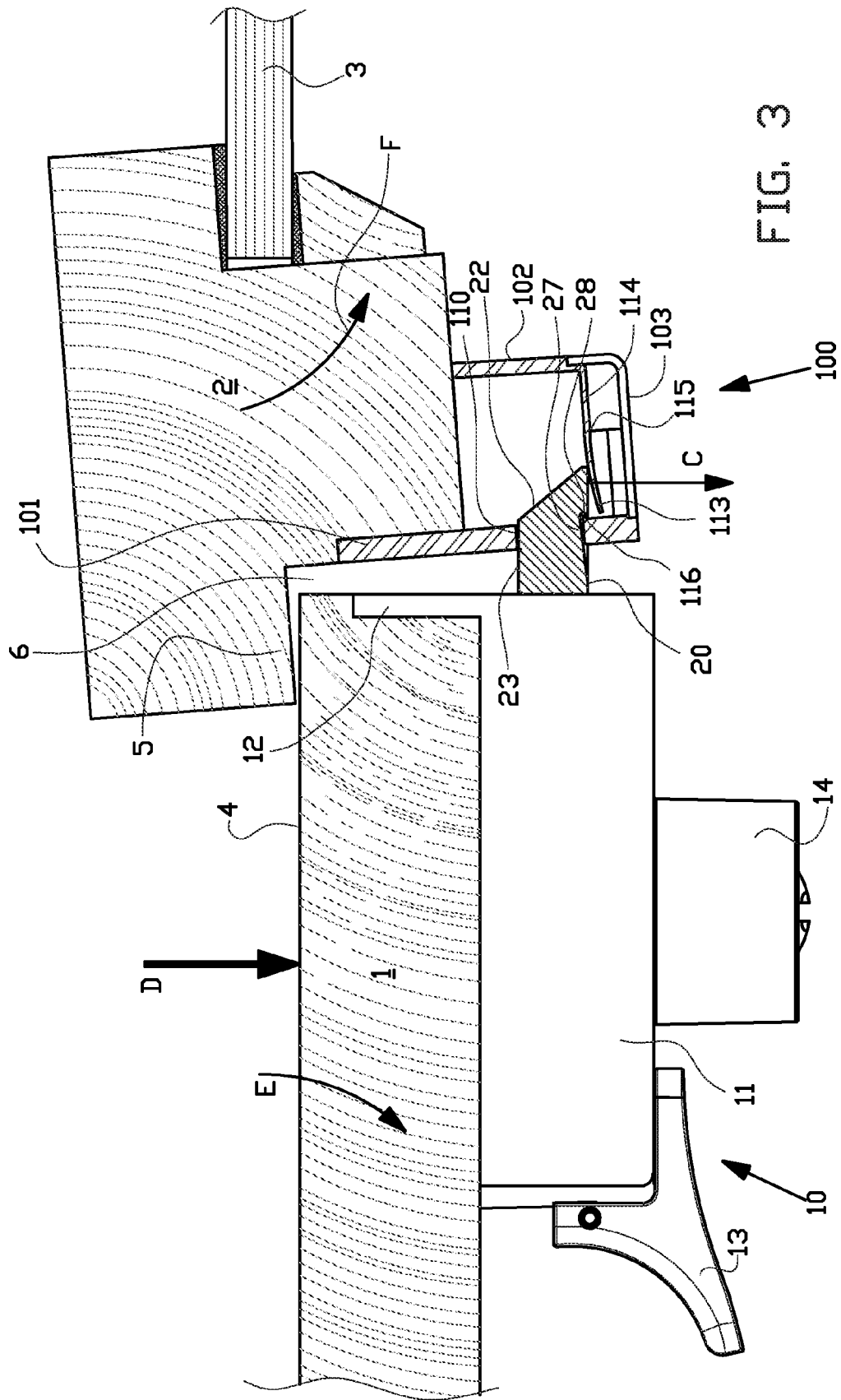
55





251





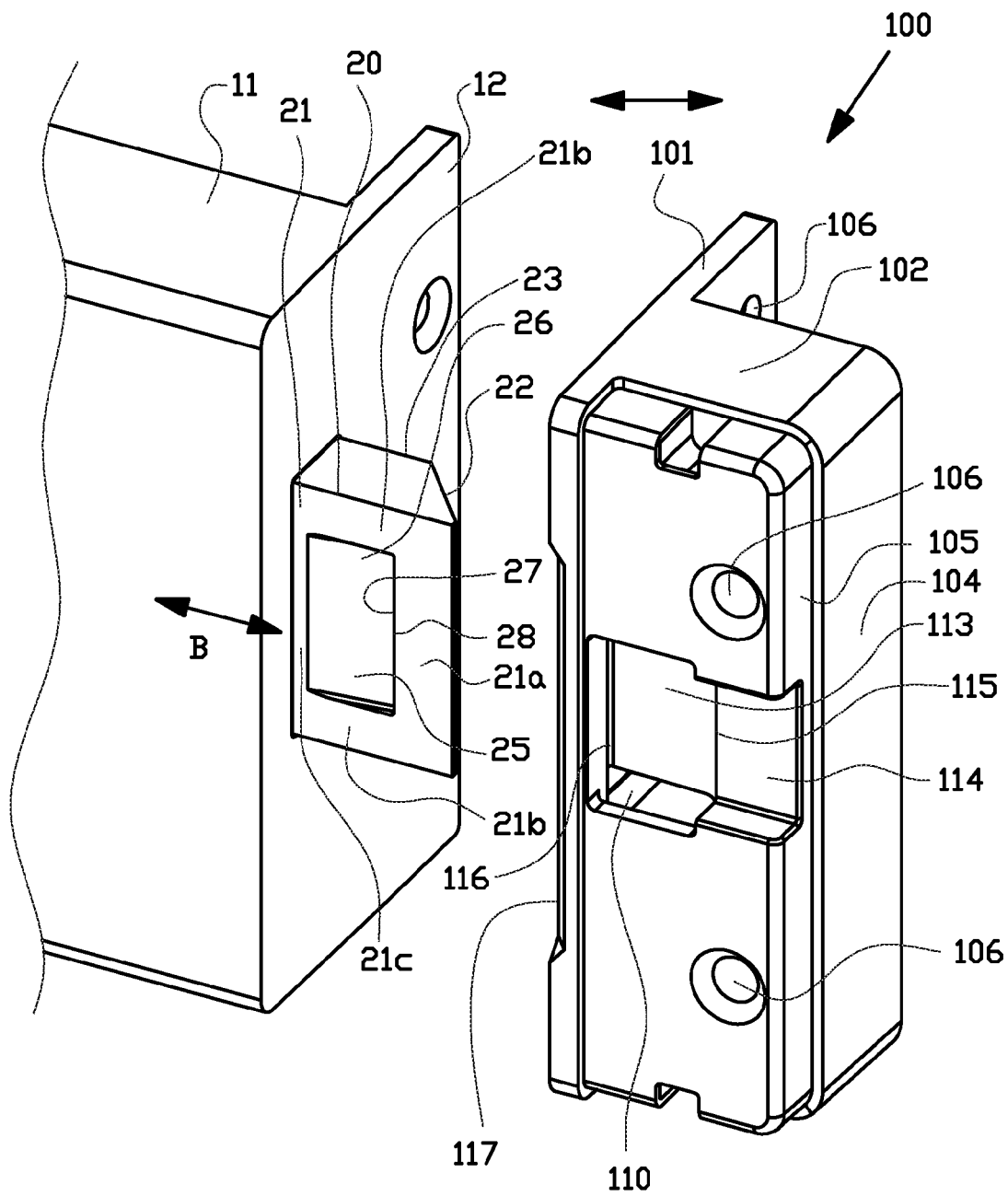


FIG. 4A

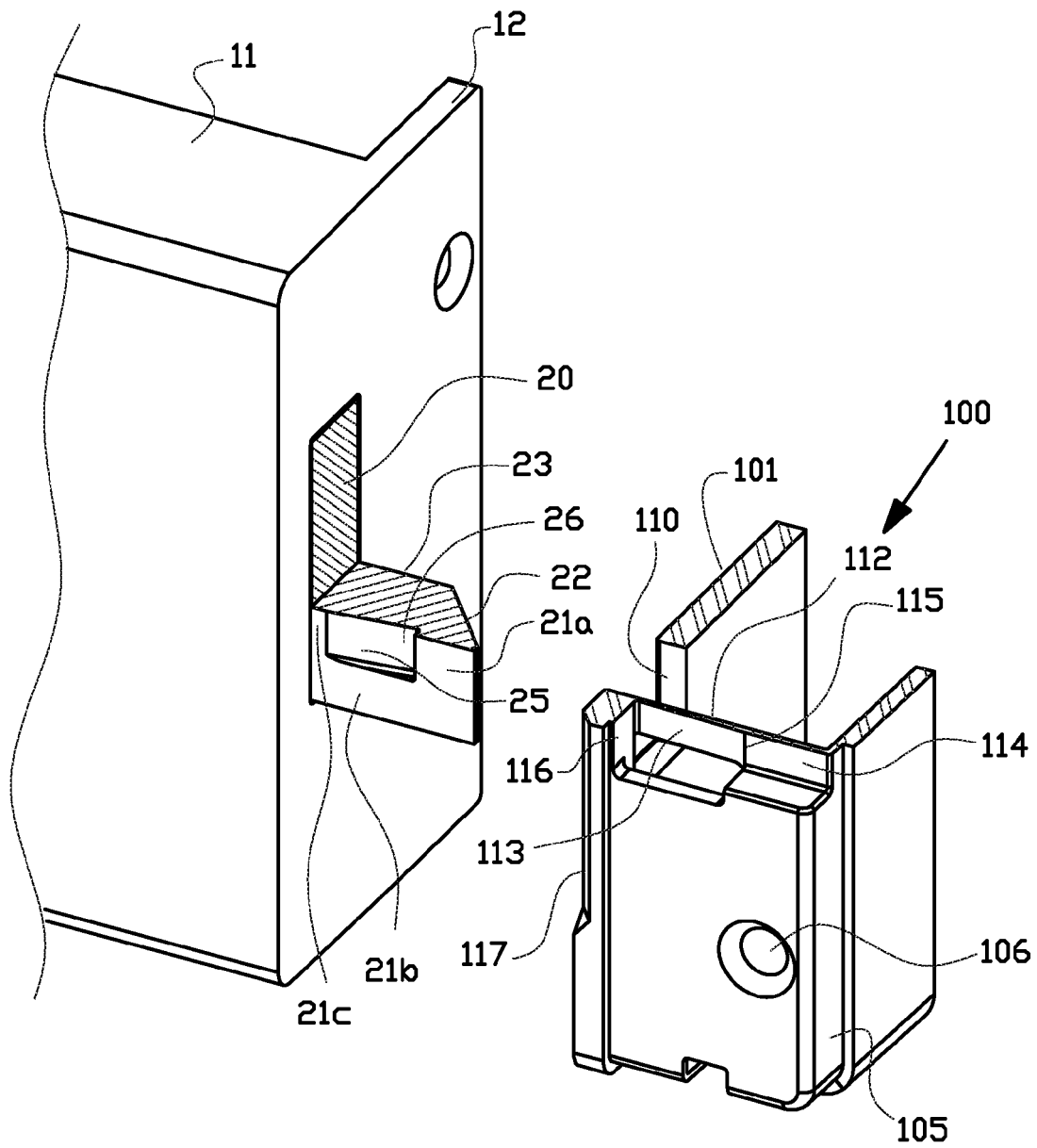


FIG. 4B

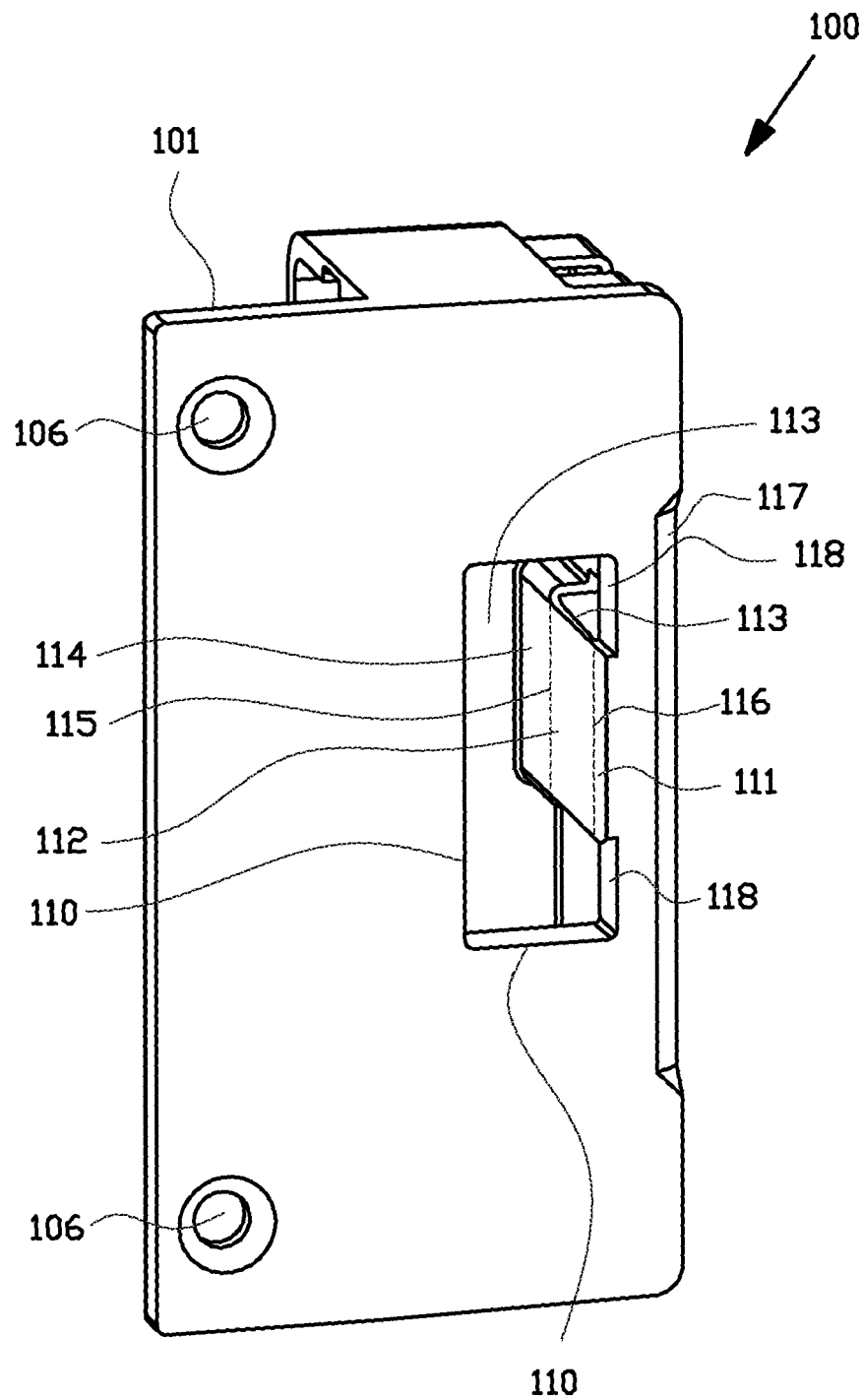


FIG. 5



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 08 15 5299

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	WO 96/07806 A (MATOUSCHEK ERICH [DE]; MATOUSCHEK THOMAS [DE]; WALLISER BRIGITTE [DE]) 14 March 1996 (1996-03-14) * page 4, line 35 - page 5, line 21 * * page 10, line 25 - page 12, line 13; figures 7-9 * -----	1-13	INV. E05B17/00 E05B17/20 E05B63/12  ADD. E05B15/02
X	FR 2 307 106 A (DUMAS PHILIPPE [FR]) 5 November 1976 (1976-11-05) * the whole document * -----	1-15	
X	US 1 901 412 A (RICHTER WILLIAM A) 14 March 1933 (1933-03-14) * the whole document * -----	1,2,4-15	
X	US 5 531 487 A (BERESHEIM THOMAS H [US]) 2 July 1996 (1996-07-02) * the whole document * -----	1,2,4-15	
X	EP 1 130 199 A (MATOUSCHEK ERICH [DE]; MATOUSCHEK THOMAS [DE]; WALLISER BRIGITTE [DE]) 5 September 2001 (2001-09-05) * the whole document * -----	1-8,12	TECHNICAL FIELDS SEARCHED (IPC)  E05B
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>23 July 2008</b>	Examiner <b>Henkes, Roeland</b>
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			

6

EPO FORM 1503 03.82 (P04C01)

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

EP 08 15 5299

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  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-07-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9607806	A	14-03-1996	AT 172774 T	15-11-1998
			AU 3222395 A	27-03-1996
			CZ 9700661 A3	11-06-1997
			EP 0779945 A1	25-06-1997
			ES 2123280 T3	01-01-1999
			FI 970988 A	10-03-1997
			HU 78079 A2	30-08-1999
			PL 319072 A1	21-07-1997
			SK 31397 A3	08-10-1997
-----				
FR 2307106	A	05-11-1976	ES 446124 A1	01-06-1977
			IT 1058046 B	10-04-1982
-----				
US 1901412	A	14-03-1933	NONE	
-----				
US 5531487	A	02-07-1996	NONE	
-----				
EP 1130199	A	05-09-2001	DE 10006946 A1	30-08-2001
			US 2001013829 A1	16-08-2001
-----				