

(19)



(11)

EP 2 977 534 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.01.2016 Bulletin 2016/04

(51) Int Cl.:
E05D 15/06 ^(2006.01) **E05F 5/00** ^(2006.01)

(21) Application number: **15167344.9**

(22) Date of filing: **12.05.2015**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
MA

(71) Applicant: **ECLISSE SRL**
31053 Pieve di Soligo TV (IT)

(72) Inventor: **DE FAVERI, Luigi**
31020 REFRONTOLO TV (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners (IT)
Via Meravigli, 16
20123 Milano (IT)

(30) Priority: **22.07.2014 IT MI20141328**

(54) **RAIL, PARTICULARLY FOR IN-WALL FRAMES OF SLIDING DOORS**

(57) A rail (1), particularly for in-wall frames of sliding doors, which is provided with a seat (6) for the sliding of at least one carriage (7a, 7b), for supporting an underlying sliding door, with one end of which it is possible to associate selectively a doorstop (14); below the latter

and outside the rail (1) it is possible to associate a flat bar (16) that can be associated selectively with said rail (1) and is provided with means (20) for lateral sliding with respect to the rail (1).

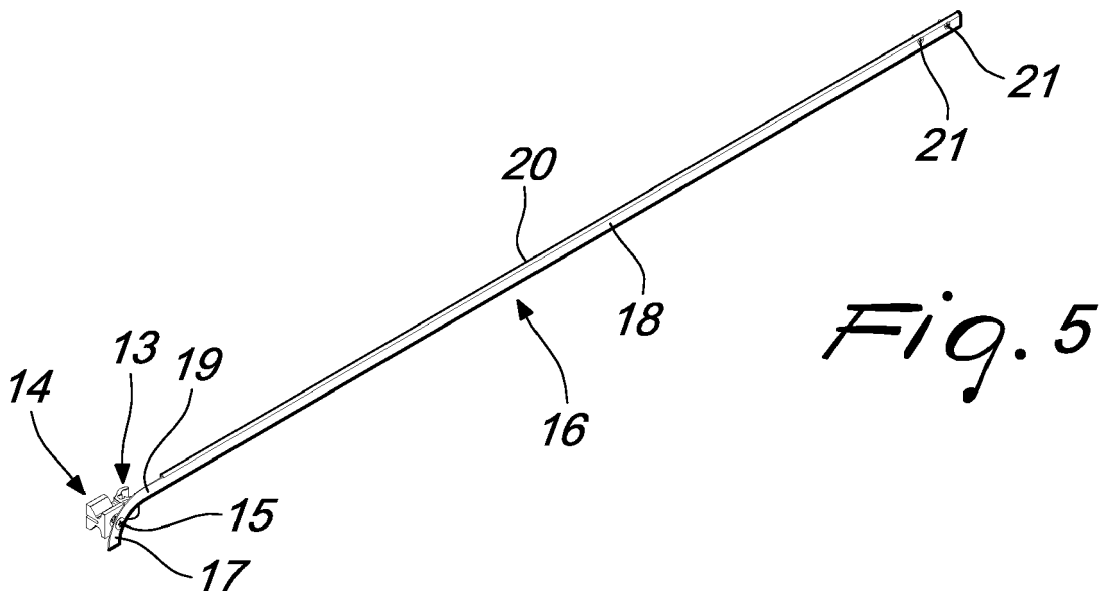


Fig. 5

EP 2 977 534 A1

Description

[0001] The present invention relates to a rail, particularly for in-wall frames of sliding doors.

[0002] Nowadays it is known to provide door frames which involve the use of an in-wall casing, positioned inside a wall, in which a door or a panel is slideably associated and which is also known as a "retractable door".

[0003] Such solution makes it possible to reduce the encumbrances of the door in a room thanks to the possibility of sliding it into the in-wall casing: thus one can use the space adjacent to the door, which would otherwise be occupied by doors of the type that are hinged laterally to a casement.

[0004] In the known art the in-wall casing, embedded in the wall or between two plasterboard slabs, defines a containment case for the door and is usually constituted by a framework that comprises a plurality of vertical profiled elements, including a front post and a rear post, between which slides the door, and an upper lintel, all of which define the opening that can be closed by way of the door.

[0005] Protruding above the case, along an axis that is longitudinal with respect to the case and that extends from the side opposite to that of the containment case, is a rail which is hidden by a horizontal jamb.

[0006] Carriages coupled to the upper edge of the door are slideably integrated in the rail in order to enable the sliding of the door into and out of the in-wall casing.

[0007] Usually associated with the end of the rail which is not associated with the vertical posts is an additional element that acts as a terminal for the abutment of the front edge of the door.

[0008] The use is also known of a doorstep which is usually constituted by a block made of plastic material, one end of which is shaped like a spout with elastically deformable wings in order to allow the insertion and the temporary locking of a complementarily shaped tab that protrudes axially with respect to the carriage.

[0009] In such sense, Italian patent no. 0001350865 discloses a doorstep with which it is possible to associate laterally the first end of a cylindrical L-shaped retaining rod; such rod thus protrudes laterally and externally both to the doorstep and to the rail and at the second end it is provided with a plate, which protrudes radially from it and along a surface perpendicular to the carriage, and is selectively positioned at adapted retaining seats which are provided on the rail.

[0010] Such solution however suffers many drawbacks: first of all the positioning of the retaining rod laterally to the doorstep increases the space occupation and is structurally complex, resulting in high production costs.

[0011] Furthermore, the positioning of the retaining rod laterally and externally to the rail entails the possibility of generating noise owing to the vibrations imposed on the retaining rod during the movement of the door.

[0012] The positioning, by gravity, of the plate on the

rail is further subject to possible decouplings caused for example by the impact of the door, when being closed, on the jamb.

[0013] Another drawback is constituted by the low flexibility of positioning of the doorstep, owing to the reduced travel of the cylindrical transfer rod, constrained by the slot provided on the sliding guide (rail) by way of which the rod is associated with the doorstep.

[0014] The aim of the present invention is therefore to resolve the above mentioned technical problems, eliminating the drawbacks in the cited known art and thus devising a rail provided with a doorstep which is structurally simple, flexible and reliable in use.

[0015] Within this aim, an object is to provide an invention that makes it possible to contain the lateral space occupation of the rail.

[0016] Another object is to provide an invention that makes it possible to eliminate any vibrations during its use and thus the noise when opening/closing the door.

[0017] Another object of the invention is to provide a rail provided with a doorstep that is stably associated with the rail.

[0018] Another object is to provide an invention that can be installed rapidly and easily, with considerable flexibility of positioning and thus of adjustment.

[0019] Another object is to provide a rail provided with a doorstep which can be made with the usual plants and machines and is low cost.

[0020] This aim and these and other objects which will become better apparent hereinafter are achieved by a rail, particularly for in-wall frames of sliding doors, which is provided with a seat for the sliding of at least one carriage for supporting an underlying sliding door, with one end of which it is possible to associate selectively a doorstep, characterized in that below said doorstep and outside said rail a flat bar is associated which can be associated selectively with said rail and is provided with means for lateral sliding with respect to said rail.

[0021] Further characteristics and advantages of the invention will become better apparent from the detailed description of a particular, but not exclusive, embodiment, illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a view from below of the invention;

Figure 2 is a front elevation view of the invention;

Figure 3 is a sectional view taken along the line III-III in Figure 1;

Figure 4 is a three-quarters side view from below of the invention;

Figure 5 is a similar view to Figure 4 of the condition in which the flat bar and the doorstep are disconnected from the rail;

Figure 6 is a plan view of the flat bar;

Figure 7 is a side view of the flat bar;

Figures 8 and 9 are two three-quarters side views of the first and of the second end of the flat bar, associated with the rail;

Figures 10 and 11 are a three-quarters side view and a detail of a variation of the rail;

Figures 12 and 13 are a three-quarters side view and a detail of the variation in the previous figures;

Figures 14 and 15 are two separate views of a detail of the doorstep of the flat bar.

[0022] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics.

[0023] With reference to the figures, the reference numeral 1 generally designates a rail, particularly for in-wall frames for sliding doors, which is provided, in a transverse cross-section, with a substantially Ω shape so as to define an upper surface 2, which is connected at its ends to a pair of first fins 3a, 3b, which protrude from it at right angles and are in turn connected at their ends to a pair of second fins 4a, 4b which are arranged at right angles and at the opposite end with respect to the respective first fins 3a, 3b.

[0024] Below the rail 1 there is a longitudinal opening 5 and, internally and axially thereto, a seat 6 for the sliding of a pair of carriages 7a, 7b, for supporting an underlying sliding door, not shown.

[0025] Each carriage 7a, 7b is constituted by a body 8 that is substantially shaped like a parallelepiped and with which, in the particular embodiment shown, two pairs of wheels 9, 10 are associated rotatably which can slide on adapted first tabs 11a, 11b that protrude within the rail 1 at a plane that is substantially equal to the plane of arrangement of the pair of second fins 4a, 4b.

[0026] Second tabs 12a, 12b protrude axially at the ends of the body 8 and have, in a transverse cross-section, a substantially circular shape.

[0027] A complementarily shaped end 13 of a doorstep 14, which is preferably made of plastic material and is accommodated slideably within the rail 1, cooperates selectively with one of the second tabs 12a, 12b.

[0028] Below the doorstep 14, at the opening 5 and externally to the rail 1, it is possible, by way of an adapted first screw 15, to associate a flat bar 16.

[0029] The latter is substantially constituted by a strip that is essentially L-shaped so as to define a first, shorter wing 17 and a second, longer wing 18, which are mutually blended along a curve.

[0030] The length of the first wing 17 is such that it lies in the interspace between the second fins 4a, 4b, and the second wing 18 is thus positioned at the region below one of the second fins 4a, 4b.

[0031] The length of the second wing 18 is such that it is arranged at a distance that is greater than the distance between the pair of carriages 7a, 7b.

[0032] At the perimetric edge 19 of the second wing 18 which is directed away from the first wing 17 means are provided for lateral sliding with respect to the rail 1, such means being constituted by a substantially C-shaped tab 20 that is folded so as to wrap around one of

the second fins 4a, 4b.

[0033] The end of the second wing 18 can be associated selectively with the rail 1, one or more holes 21 being provided therein and acting as seats for an adapted fastening screw 22 that is adapted to lock the second wing 18 in a selected point of one of the second fins 4a, 4b.

[0034] Thus it has been found that the invention fully achieves the intended aim and objects, a rail having been devised that is structurally simple, low cost and provided with a doorstep that is also structurally simple and reliable in use and which makes it possible to contain the lateral space occupation of the rail since it is arranged below it.

[0035] The invention further makes it possible to eliminate any vibrations during its use and thus the noise when opening/closing the door, owing to its lateral connection to a second tab 4a or 4b, while the presence of the fastening screw 22 makes it possible to stably couple the doorstep in a selected position with respect to the rail.

[0036] Obviously, the invention is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0037] Thus, for example, Figures 11 to 15 show a second embodiment for a rail 101 which comprises a doorstep 114 provided with an elastically deformable end 113 that cooperates with one of the second tabs which protrude from the body that constitutes each carriage.

[0038] Below the doorstep 114, at the opening 105 and externally to the rail 101, it is possible to associate, by way of an adapted screw 115, a bar 123 that is substantially L-shaped so as to define a third wing 124, the width of which is approximately equal to the distance between the ends of the pair of second fins 104a, 104b and the length of which is slightly shorter than that of the doorstep 114.

[0039] A fourth wing 125 protrudes from the third wing 124 at the plane of arrangement of one of the second fins 104a, 104b and extends axially by an extent that is slightly greater than that on which the end 113 of the doorstep 114 lies.

[0040] A flat bar 116 is provided that has a substantially rectilinear shape so as to define a second wing 118 that is longer than the distance between the pair of carriages and is substantially as wide as one of the second fins 104a, 104b.

[0041] The interconnection between one end of the second wing 118 and the fourth wing 125 occurs by way of an adapted connection, such as a second screw 126.

[0042] Advantageously, the fourth wing (125) lies on a plane that lies slightly below the plane of arrangement of the third wing (123), the displacement between the planes being substantially equal to the thickness of the second wing 118.

[0043] In this case also, at the perimetric edge 119 of the second wing 118 means are provided for lateral sliding with respect to the rail 101, such means being constituted by a substantially C-shaped tab 120 that is folded so as to wrap around one of the second fins 104a, 104b.

[0044] The end of the second wing 118 can be asso-

ciated selectively with the rail 101, one or more holes being provided therein and acting as seats for an adapted fastening screw 122 that is adapted to lock the second wing 118 in a selected point of one of the second fins 104a, 104b.

[0045] Such solution also achieves the set aim and objects.

[0046] Obviously, the materials used as well as the dimensions of the individual components of the invention may be more pertinent according to specific requirements.

[0047] The various means of achieving certain different functions certainly need not coexist only in the embodiment shown, but may be present in many embodiments, even if they are not shown.

[0048] The characteristics indicated above as advantageous, convenient or the like, may also be missing or be substituted by equivalent characteristics.

[0049] The disclosures in Italian Patent Application No. MI2014A001328 from which this application claims priority are incorporated herein by reference.

[0050] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A rail (1, 101), particularly for in-wall frames of sliding doors, which is provided with a seat (6) for the sliding of at least one carriage (7a, 7b), for supporting an underlying sliding door, with one end of which it is possible to associate selectively a doorstep (14, 114), **characterized in that** below said doorstep (14, 114) and outside said rail (1, 101) a flat bar (16, 116) is associated which can be associated selectively with said rail (1, 101) and is provided with means (20, 120) for lateral sliding with respect to said rail (1, 101).
2. The rail (1, 101) according to claim 1, provided, in a transverse cross-section, with a substantially omega-like shape so as to define an upper surface (2), which is connected at its ends to a pair of first fins (3a, 3b), which protrude from it at right angles and are in turn connected at their ends to a pair of second fins (4a, 4b, 104a, 104b) which are arranged at right angles and at the opposite end with respect to the respective first fins (3a, 3b), below said rail (1, 101) there being a longitudinal opening (5, 105) and, internally and axially thereto, a seat (6) for the sliding of a pair of carriages (7a, 7b), for supporting an underlying sliding door, each carriage (7a, 7b) being constituted by a body (8) that is substantially shaped

like a parallelepiped and with which two pairs of wheels (9, 10) are associated rotatably which can slide on adapted first tabs (11a, 11b) that protrude within said rail (1, 101) at a plane that is substantially equal to the plane of arrangement of said pair of second fins (4a, 4b, 104a, 104b), second tabs (12a, 12b) protruding axially at the ends of said body (8) and having, in a transverse cross-section, a substantially circular shape, with at least one of which a complementarily shaped end (13) of a doorstep (14, 114) accommodated slideably within said rail (1, 101) co-operates selectively, **characterized in that** below said doorstep (14, 114), at said opening (5, 105) and externally to said rail (1, 101), it is possible to associate a flat bar (16, 116).

3. The rail according to one or more of the preceding claims, **characterized in that** said flat bar (16) is constituted by a strip that is substantially L-shaped so as to define a first, shorter wing (17) and a second, longer wing (18), which are mutually blended along a curve.
4. The rail according to one or more of the preceding claims, **characterized in that** the length of said first wing (17) is such that it lies in the interspace between said second fins (4a, 4b), said second wing (18) being arranged at the region below one of said second fins (4a, 4b), the length of said second wing (18) being such that it is arranged at a distance that is greater than the distance between said pair of carriages (7a, 7b).
5. The rail according to one or more of the preceding claims, **characterized in that** below said doorstep (114), at said opening (105) and externally to said rail (101), it is possible to associate, by way of an adapted screw (115), a bar (123) that is substantially L-shaped so as to define a third wing (124), the width of which is approximately equal to the distance between the ends of said pair of second fins (104a, 104b) and the length of which is slightly shorter than that of said doorstep (114).
6. The rail according to one or more of the preceding claims, **characterized in that** a fourth wing (125) protrudes from said third wing (124) at the plane of arrangement of one of said second fins (104a, 104b) and extends axially by an extent that is slightly greater than that on which said end (113) of said doorstep (114) lies, said flat bar (116) having a substantially rectilinear shape so as to define a second wing (118) that is longer than the distance between said pair of carriages and is substantially as wide as one of said second fins (104a, 104b).
7. The rail according to one or more of the preceding claims, **characterized in that** at the perimetric edge

(19) of said second wing (18) which is directed away from said first wing (17) means are provided for lateral sliding with respect to said rail (1), said means being constituted by a substantially C-shaped tab (20) that is folded so as to wrap around one of said second fins (4a, 4b). 5

8. The rail according to one or more of the preceding claims, **characterized in that** the end of said second wing (18, 118) can be associated selectively with said rail (1, 101), one or more holes (21) being provided therein and acting as seats for an adapted fastening screw (22, 122) that is adapted to lock said second wing (18, 118) in a selected point of one of said second fins (4a, 4b, 104a, 104b). 10 15
9. The rail according to one or more of the preceding claims, **characterized in that** the interconnection between one end of said second wing (118) and said fourth wing (125) occurs by way of an adapted connection, such as a second screw (126), said fourth wing (125) lying on a plane that lies slightly below the plane of arrangement of said third wing (123), the displacement between the planes being substantially equal to the thickness of said second wing (118). 20 25
10. The rail according to one or more of the preceding claims, **characterized in that** at the perimetric edge (119) of said second wing (118) means are provided for lateral sliding with respect to said rail (101), said means being constituted by a substantially C-shaped tab (120) that is folded so as to wrap around one of said second fins (104a, 104b). 30 35

40

45

50

55

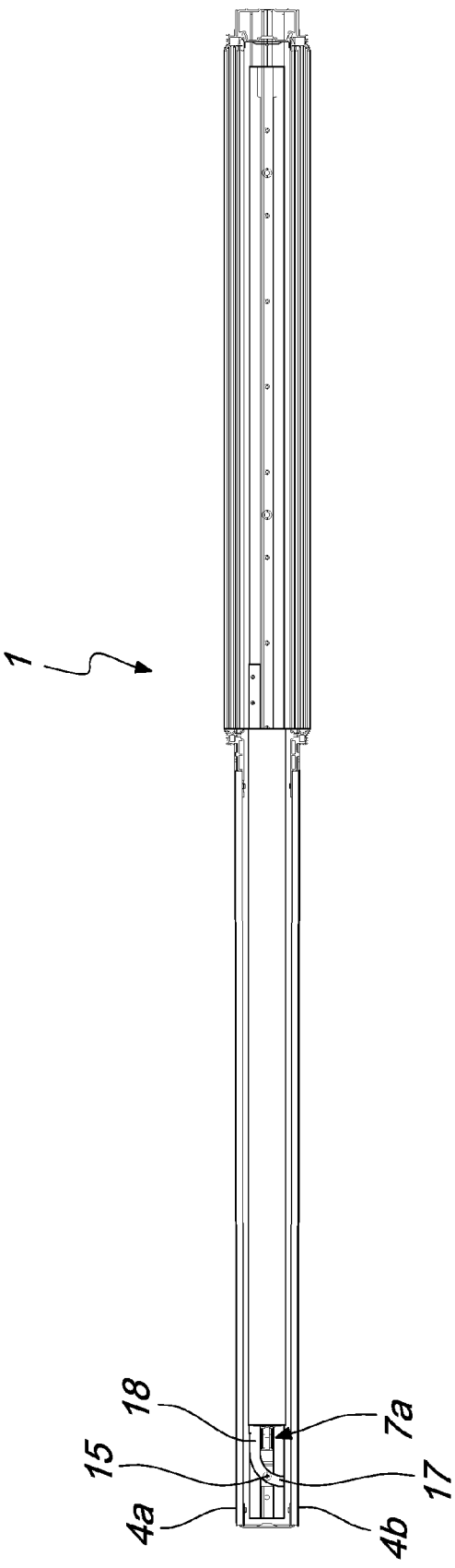
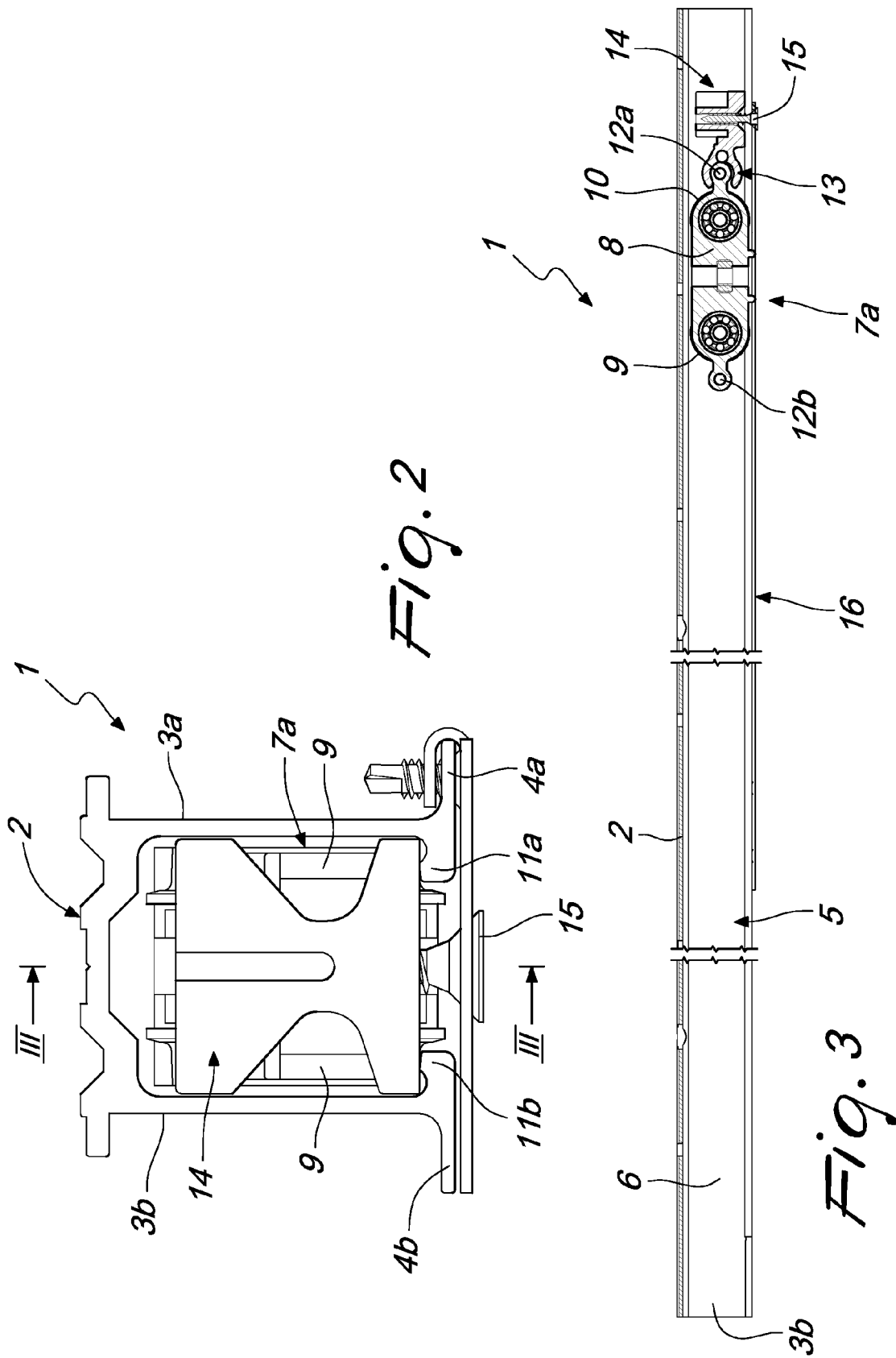
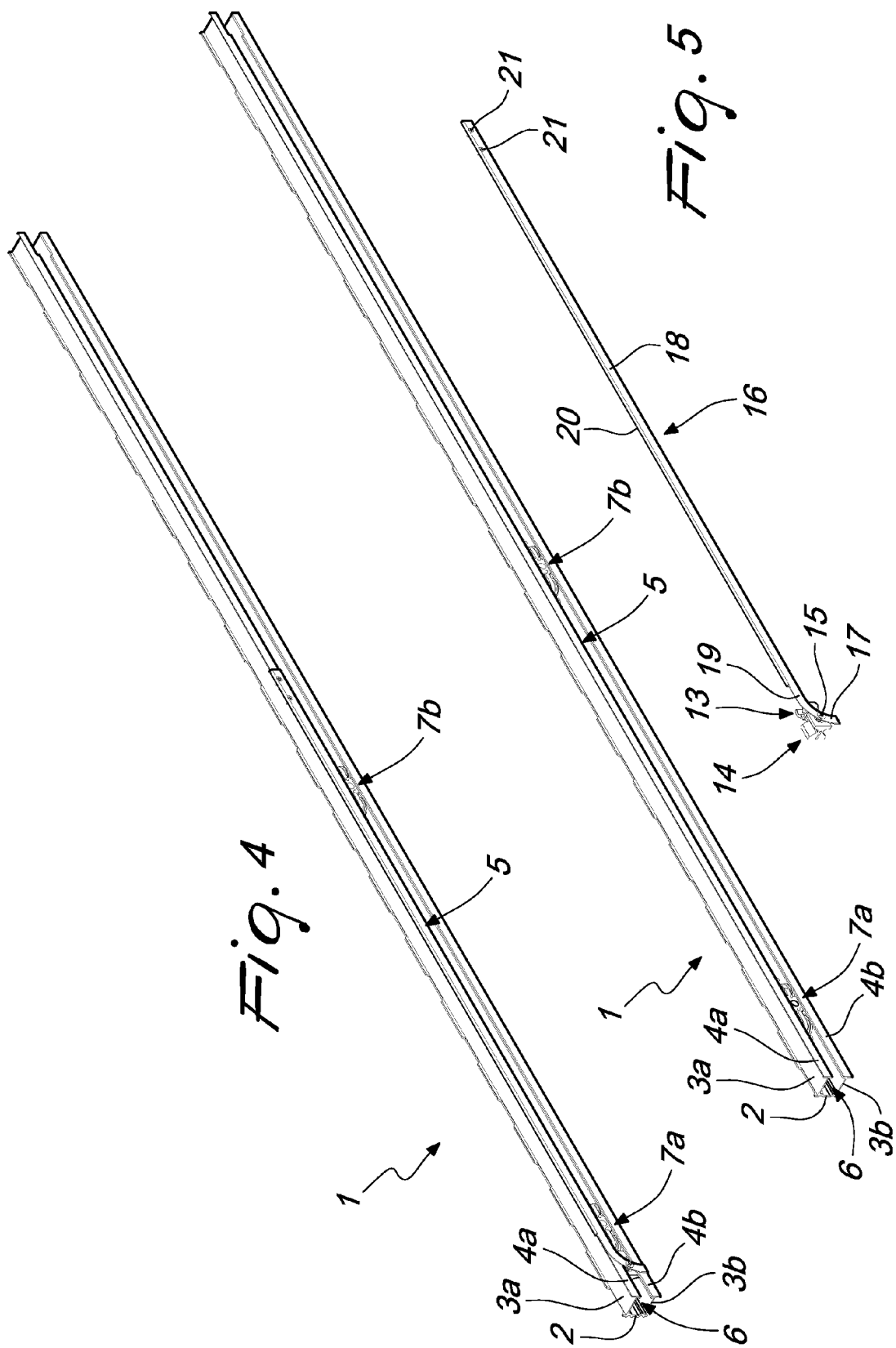
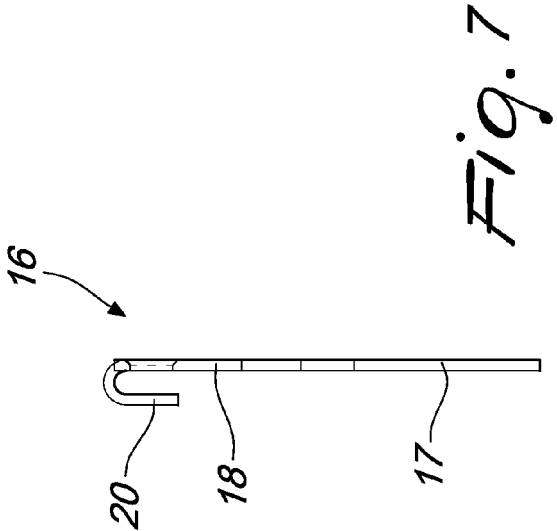
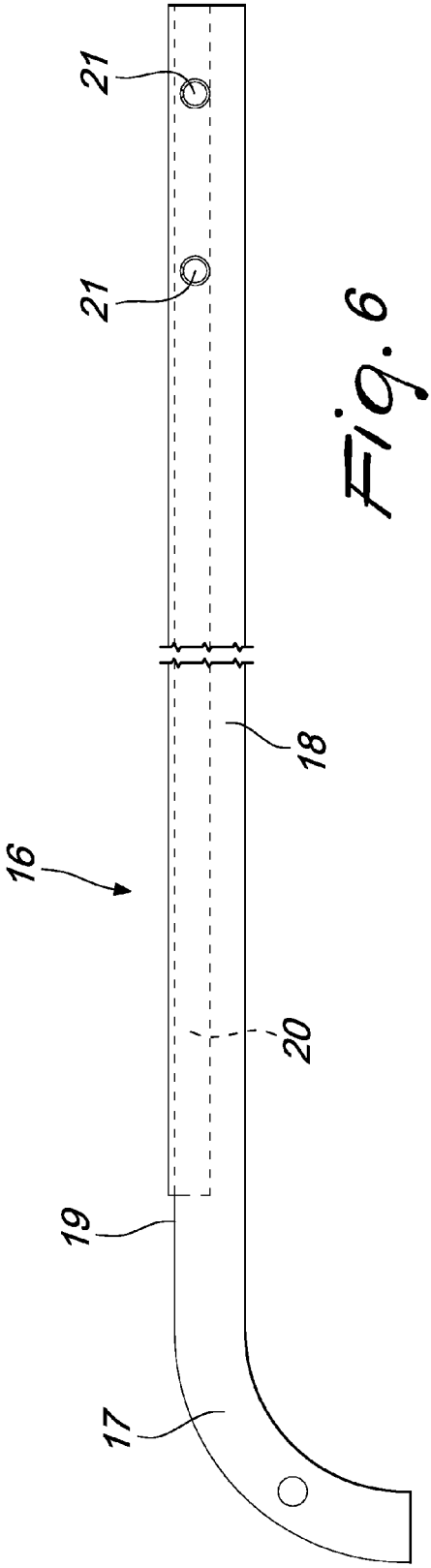
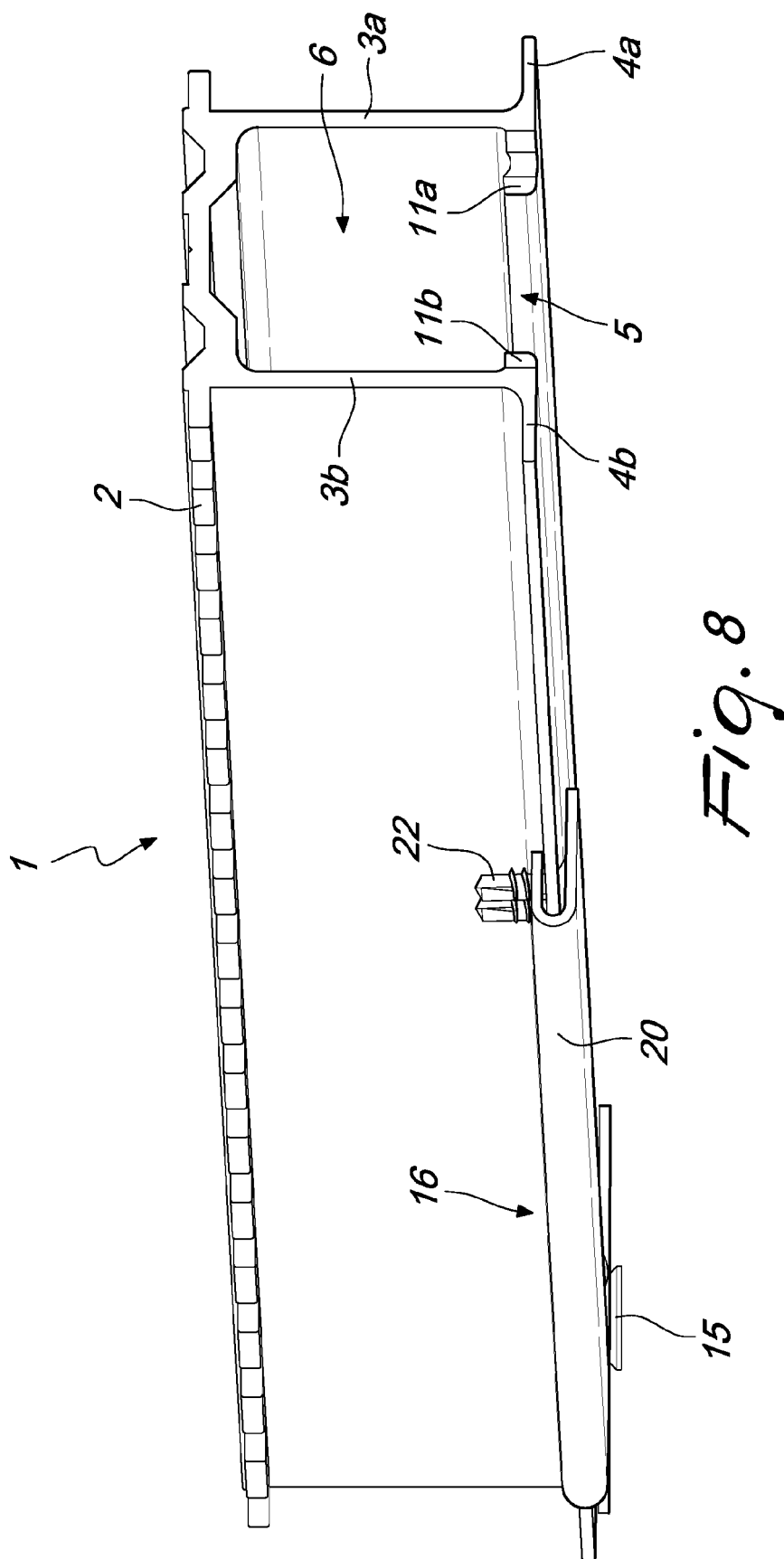


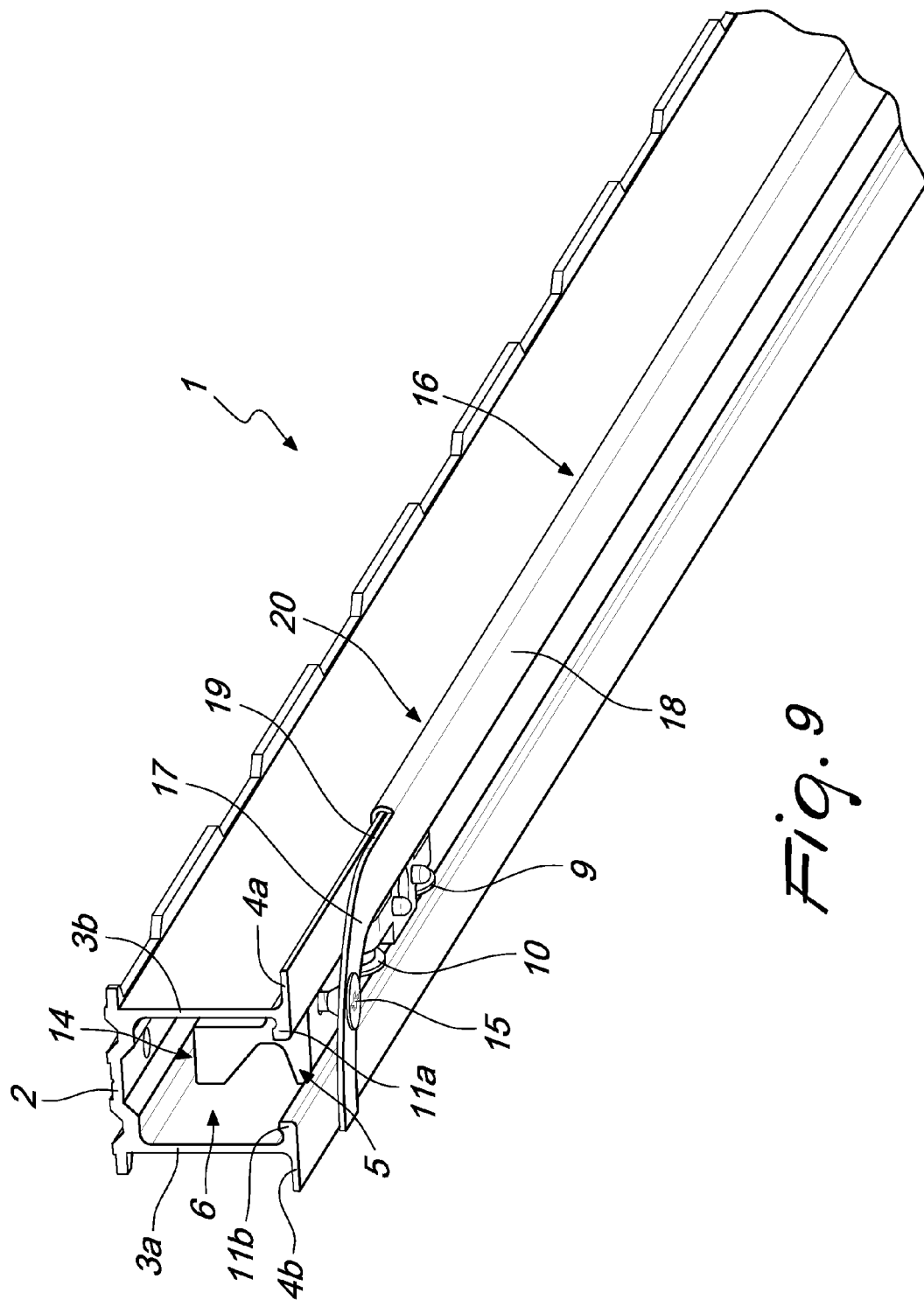
Fig. 1

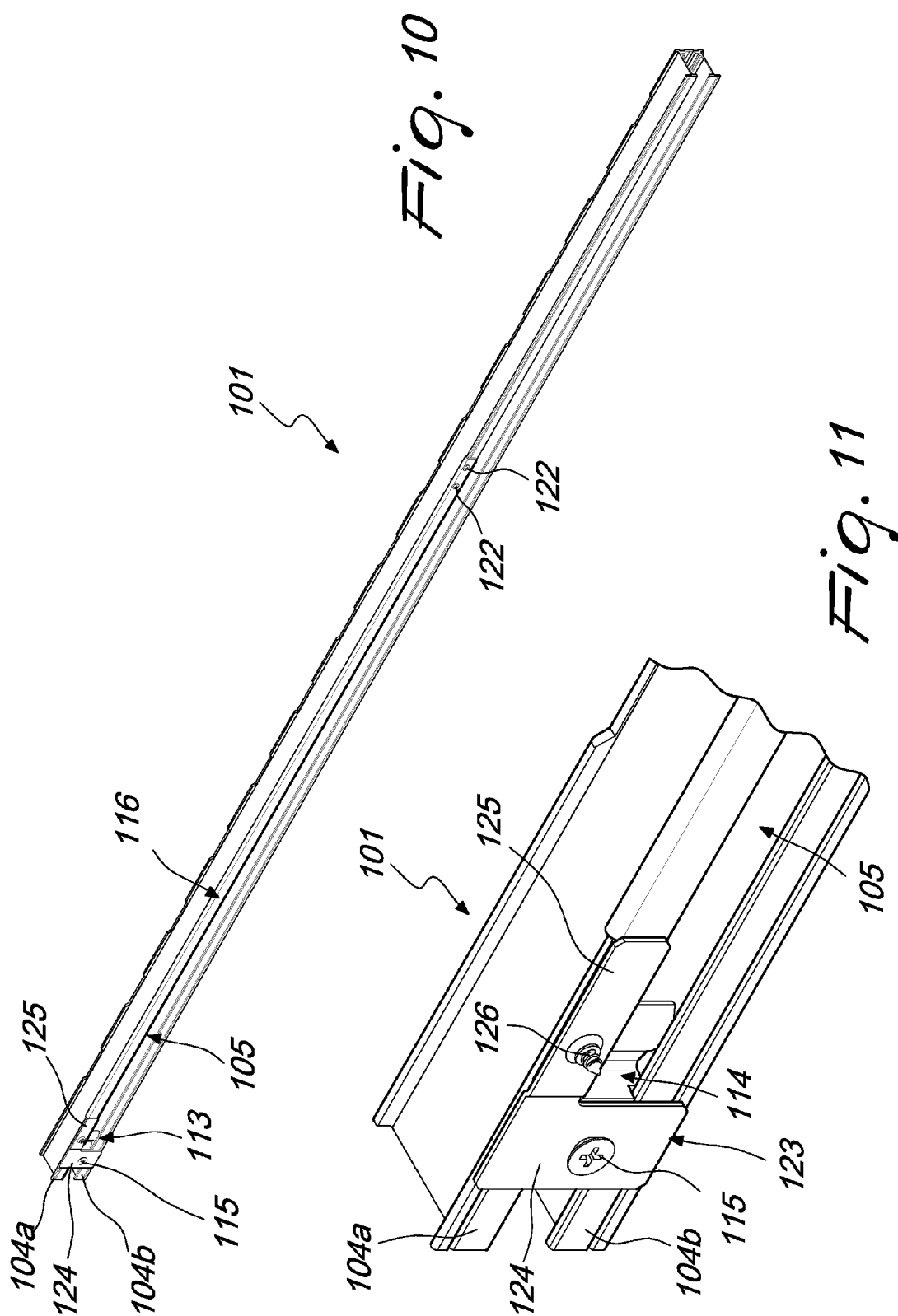


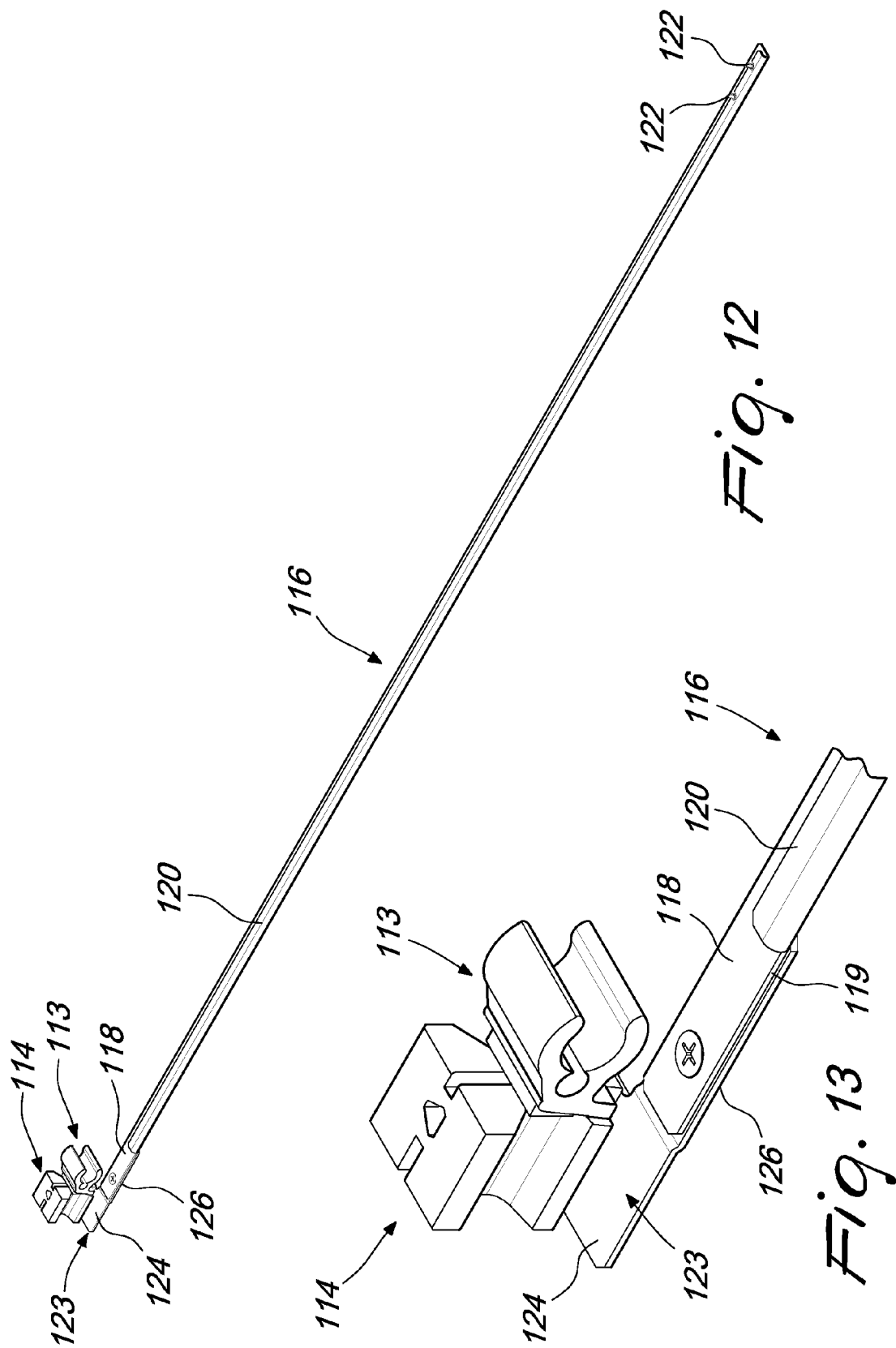


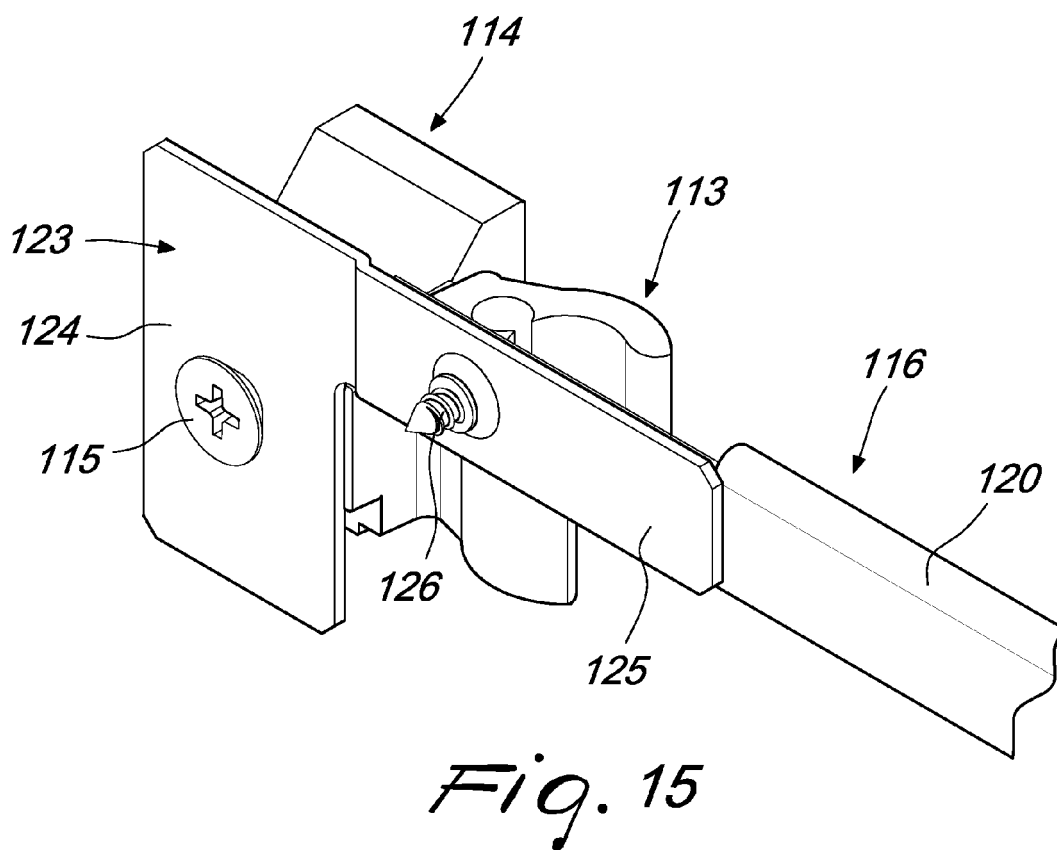
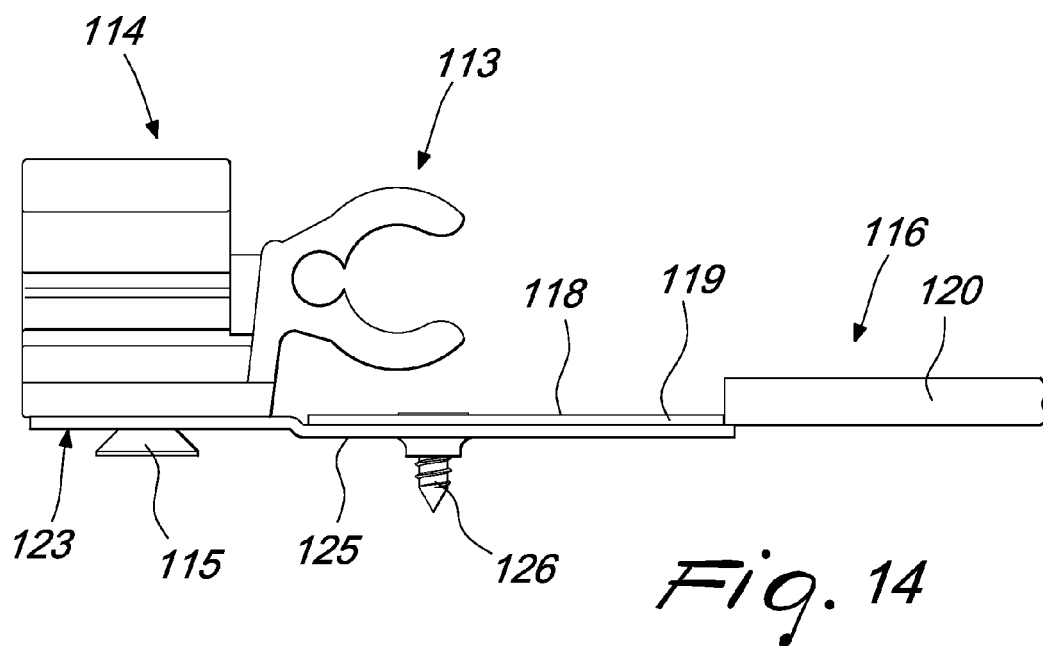














EUROPEAN SEARCH REPORT

 Application Number
EP 15 16 7344

5

10

15

20

25

30

35

40

45

50

55

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	DE 197 41 156 A1 (HOERMANN KG VERKAUFSGES [DE]) 23 April 1998 (1998-04-23)	1	INV. E05D15/06 E05F5/00
Y	* column 3, lines 6-23,39-45 *	2	
A	* column 1, lines 3-10 *	3-10	
	* column 4, lines 13-21 *		
	* figures 1,2 *		
Y	----- EP 1 028 214 A2 (BAUELEMENTE KONTAKT GMBH & CO [DE]) 16 August 2000 (2000-08-16)	2	
A	* paragraphs [0001], [0003], [0007], [0012], [0013] *	1,3-10	
	* figures 1,3 *		
A	----- DE 10 2011 075778 B3 (GEZE GMBH [DE]) 28 June 2012 (2012-06-28)	1-10	
	* paragraphs [0017], [0018], [0020] *		
	* figures 1,2 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E05D E05F
Place of search		Date of completion of the search	Examiner
The Hague		19 November 2015	Wagner, Andrea
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
Y : particularly relevant if combined with another document of the same category		E : earlier patent document, but published on, or after the filing date	
A : technological background		D : document cited in the application	
O : non-written disclosure		L : document cited for other reasons	
P : intermediate document		& : member of the same patent family, corresponding document	

1

EPO FORM 1503 03.82 (P04C01)

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

EP 15 16 7344

5

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.

19-11-2015

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19741156 A1	23-04-1998	AT 202183 T	15-06-2001
		CN 1231016 A	06-10-1999
		CZ 9900880 A3	15-09-1999
		DE 19741156 A1	23-04-1998
		DE 59703816 D1	19-07-2001
		EP 0927292 A1	07-07-1999
		HU 0003524 A2	28-02-2001
		NO 991180 A	11-03-1999
		PL 332204 A1	30-08-1999
		WO 9812405 A1	26-03-1998

EP 1028214 A2	16-08-2000	DE 19905272 C1	16-11-2000
		EP 1028214 A2	16-08-2000

DE 102011075778 B3	28-06-2012	DE 102011075778 B3	28-06-2012
		EP 2522800 A2	14-11-2012

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT 0001350865 [0009]
- IT MI20141328 A [0049]