



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**21.06.2017 Bulletin 2017/25**

(51) Int Cl.:  
**E05D 7/04 (2006.01) E05D 11/00 (2006.01)**

(21) Application number: **16002670.4**

(22) Date of filing: **16.12.2016**

(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 MD**

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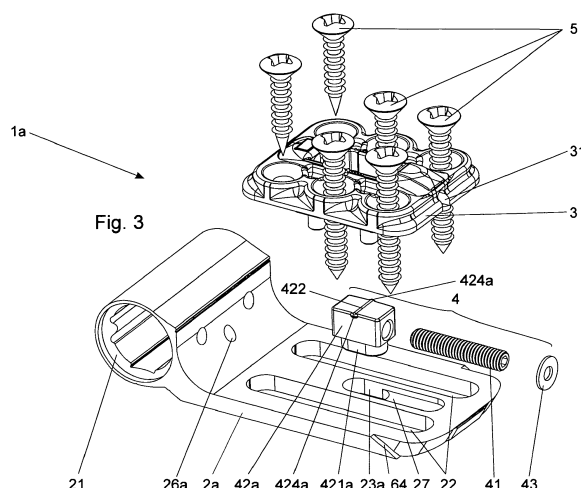
(30) Priority: **17.12.2015 PL 12468615**  
**17.12.2015 PL 12488715**

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(54) **SASH HINGE MEMBER**

(57) The invention relates to a sash hinge member (1) apt for pivotally mounting a door or a window sash (7) in a frame (8), as well as adjusting position of said sash (7) within said frame (8) comprising a strap (2) provided with a pivotal member (21) and at least two slits (22) perpendicular to the hinge axis (A); a clamping plate (3) apt to be slidably disposed in said slits (22) and having openings for fixing elements (5) preferably in a form of screws; a protective cap (6) to cover said strap (2) after being mounted on said sash (7); and adjusting means (4) for adjusting position of said sash (7) in direction perpendicular to the hinge axis (A) comprising an adjusting screw (41) and a threaded guide (42) cooperating with said screw (41). In order to provide a sash hinge member (1) with adjusting means (4) for adjusting position of the sash in direction perpendicular to the hinge axis (A) said clamping plate (3) is provided with a longitudinal slit (32) substantially perpendicular to the hinge axis (A) and closed at both ends with retaining surfaces (39), said shaped guide (42) is slidably disposed in said slit (32) of said clamping plate (3) and fixed to said strap (2), and said adjusting screw (41) is disposed in said slit (32). Preferably said clamping plate (3) is further provided with an opening (31) for a tool applying a torque on said screw (41), collinear with the axis of the screw (41) and passing through the retaining surface (39) distal to the pivotal member (21).



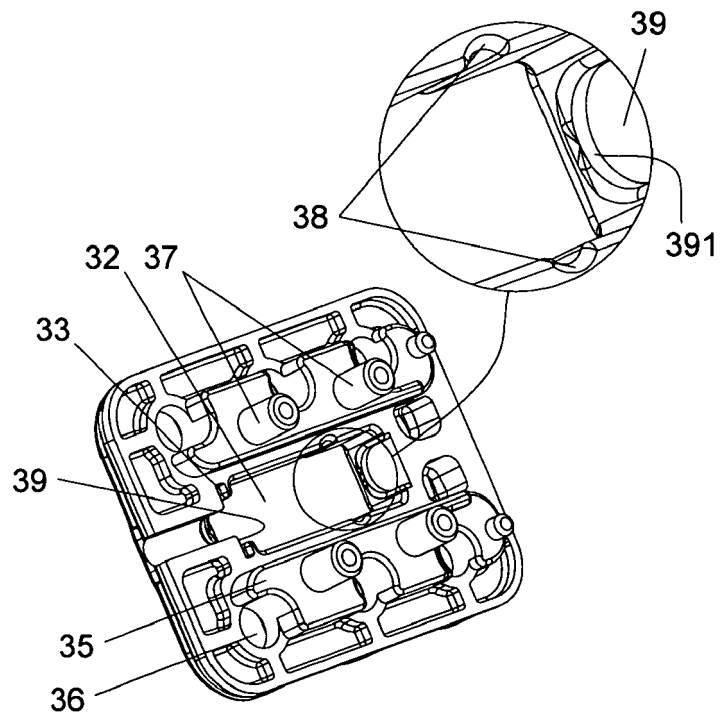


Fig. 5

## Description

**[0001]** The invention relates to a sash hinge member apt for pivotally mounting a door or a window sash in a frame, as well as adjusting position of said sash within said frame comprising a strap provided with a pivotal member and at least two slits perpendicular to the hinge axis; a clamping plate apt to be slidably disposed in said slits and having openings for fixing elements preferably in a form of screws; a protective cap to cover said strap after being mounted on said sash; and adjusting means for adjusting position of said sash in direction perpendicular to the hinge axis comprising an adjusting screw and a threaded guide cooperating with said screw.

## Background of the Invention

**[0002]** Usually means for adjusting position of the sash in direction perpendicular to the axis of the hinge are mounted in the sash hinge member, while means for adjusting position of the sash in direction parallel to the axis of the hinge are mounted in the frame hinge member.

**[0003]** Polish patent PL 18835281 (WO 9920864) discloses a hinge plate for door or window sash, comprising a flat hinge strap which is located on a door or window sash provided with a wall section for a bearing bolt, a clamping plate which clamps the hinge strap on the sash by activating fastening means which engage in said sash, as well as adjusting means which displace the hinge strap relatively between its edges when the hinge strap is not clamped in place, and a protective cap which encompasses the hinge strap the clamping plate, and the bearing bolt. The adjusting means have a form of an adjusting screw and an adjusting nut. The head of the adjusting screw is disposed in a recess in the hinge strap while the adjusting nut is disposed in a recess in the clamping plate. While turning the adjusting screw the adjusting nut displaces the clamping plate along with the sash. Similar solutions are disclosed in Polish patent PL 186418 (DE 29721037.8) and German utility model specification DE 29622639.

**[0004]** An object of the present invention has been to provide a sash hinge member with adjusting means for adjusting position of the sash in direction perpendicular to the hinge axis that would be easy to assembly and economical in production.

## Summary of the Invention

**[0005]** Therefore, a sash hinge member of the kind mentioned in the outset, according to the present invention is characterised in that said clamping plate is provided with a longitudinal slit substantially perpendicular to the hinge axis and closed at both ends with retaining surfaces, said shaped guide is slidably disposed in said slit of said clamping plate and fixed to said strap, and said adjusting screw is disposed in said slit.

**[0006]** Preferably said clamping plate is further provided

ed with an opening for a tool applying a torque on said screw, collinear with the axis of the screw and passing through the retaining surface distal to the pivotal member. This enables for a simple and convenient regulation.

**[0007]** In such a case preferably said clamping plate is further provided with an annular groove in the vicinity of said retaining surface distal to the pivotal member for accommodating a retainer provided with an opening for a tool applying a torque on said screw and supporting said adjusting screw during an adjustment process. The retainer strengthens the retaining surface weakened by the presence of the opening for a tool.

**[0008]** Preferably said shaped guide is provided with at least one locking projection extending over a wall of the guide and the wall of said slit in a direction parallel to the hinge axis, and said clamping plate comprises at least one groove for inserting said locking projection of said guide. This enables for securely coupling the adjusting means with the clamping plate assembling the hinge.

**[0009]** Preferably said shaped guide is press fitted in the strap and preferably provided with a projection matching a groove in the strap.

**[0010]** In an alternative embodiment said shaped guide is preferably integral with the strap.

**[0011]** Preferably said clamping plate is provided with rib-shaped members slidably disposed in said slits of said strap.

## Brief description of drawings

**[0012]** The invention shall be described and explained below in reference to its preferred embodiments and in connection with the attached drawings wherein:

Fig. 1 shows the first embodiment of the sash hinge member without protective cap in top view;

Fig. 2 shows the first embodiment of the sash hinge member exploded in perspective view;

Fig. 3 shows the first embodiment of the sash hinge member exploded in another perspective view;

Fig. 4 shows a clamping plate of the present invention along with the adjusting means in perspective view;

Fig. 5 shows a clamping plate of the present invention alone in another perspective view;

Fig. 6 shows the second embodiment of the sash hinge member without a protective cap in perspective view;

Fig. 7 shows the second embodiment of the sash hinge member exploded in perspective view along with the protective cap;

Fig. 8 shows the second embodiment of the sash hinge member in cross-section along the plane perpendicular to the hinge axis and passing through the adjusting screw axis along with an enlarged detail;

Fig. 9 shows the second embodiment of the sash hinge member exploded in another perspective view;

Fig. 10 shows the first embodiment of the sash hinge member with a protective cap mounted on the sash profile and pivotally coupled with two frame hinge members forming a triple flag hinge assembly, in perspective view; and

Fig. 11 shows the second embodiment of the sash hinge member with a protective cap mounted on the sash profile and pivotally coupled with one frame hinge member forming a double flag hinge assembly in perspective view.

#### Detailed description of preferred embodiments

**[0013]** If not indicated otherwise, numerical references of elements performing the same functions remain the same in the drawings, wherein suffixes (a, b) were added, where appropriate, to additionally distinct elements having the same functionality but different construction.

**[0014]** As shown in Figs. 1-5, the first embodiment of the sash hinge member 1a for pivotally mounting a door or a window sash in a frame comprises a sleeve member 21 for pivotally mounting a hinge pin (not shown) which is uniform with a strap 2a. In order to connect the hinge member 1a to a door or a window, the strap 2a is provided with two slits 22 parallel to the longitudinal edges of the strap 2 to accommodate fixing elements 5 and locking members 37, as well as to displaceably fix a clamping plate 3 to the strap 2.

**[0015]** The hinge member 1a is further provided with horizontal adjusting means 4 comprising an adjusting screw 41, a shaped threaded guide 42 and a retainer 43. The clamping plate 3 is provided with a longitudinal slit 32 for the shaped guide 42 and opening 31 for displacing the screw 41, so that one end of the adjusting screw 41 is available for an adjusting tool (not shown) through the opening 31 at the external side of the clamping plate 3. Furthermore the clamping plate 3 is provided with a groove 33 close to the slit 32 for accommodating the retainer 43 which supports the adjusting screw 41 during an adjustment process, covering and securing the opening 31 and the slit 32 at the external side of the clamping plate 3. The shaped guide 42 is slidably but tightly disposed within the slit 32 and is provided at its bottom side with a projection 421 matching a groove 23a in the strap 2a in which it is tightly fixed. At its upper surface the shaped guide 42 is provided with a position marker 422 and the clamping plate 3 is provided with a scale 34, which enable for indicating displacement direction and length while adjusting position.

**[0016]** The clamping plate 3 is provided at its bottom side with two rib-shaped members 35 that correspond to the slits 22 in the strap 2a and are located therein after assembly. In order to accommodate three pairs of fixing elements 5 in form of the screws the clamping plate 3 is provided with openings 36 disposed in equal distances on its upper surface that pass through the rib-shaped members 35. Locking members 37 of the clamping plate 3 are disposed in slits 22 and project at the other side of

the strap 2a (cf. Fig. 8).

**[0017]** Furthermore clamping plate 3 has numerous hollows in order to reduce the weight of the plate 3 and thus the load of the hinge member 1 a.

**[0018]** As shown in Figs. 4-9, the second embodiment of the sash hinge member 1 b for pivotally mounting a door or a window sash in a frame comprises a sleeve pivotal member 21 for pivotally mounting a hinge pin (not shown) which is uniform with a strap 2 that can be covered with a protective cap 6b. In order to connect the hinge member 1 b to a door or a window, the strap 2b is provided with two slits 22 parallel to the longitudinal edges of the strap 2b to accommodate fixing elements 5 and locking members 37, as well as to displaceably fix a clamping plate 3 to the strap 2b. The longitudinal edges 24b of the strap 2b are raised forming a sort of a wall so that the cross-section of the strap 2b is U-shaped.

**[0019]** The hinge member 1 b is further provided with horizontal adjusting means 4 disposed partially within the strap 2b and partially within recessions in the clamping plate 3. Said horizontal adjusting means 4 comprise an adjusting screw 41, a shaped guide 42b uniform with the strap 2 and a retainer 43. The guide 42b has a substantially cuboidal shape with a longitudinal threaded opening 423 for the adjusting screw 41. The clamping plate 3 is provided with a longitudinal slit 32 for the shaped guide 42b and opening 31 for displacing the screw 41, so that one end of the adjusting screw 41 is available for an adjusting tool (not shown) through the opening 31 at the external side of the clamping plate 3. Furthermore the clamping plate 3 is provided with a groove 33 close to the slit 32 for accommodating the retainer 43 which supports the adjusting screw 41 during an adjustment process, covering and securing the opening 31 and the slit 32 at the external side of the clamping plate 3.

**[0020]** The shaped guide 42b is slidably but tightly disposed within the slit 32. At its upper surface the shaped guide 42b is provided with a position marker 422 and the clamping plate 3 is provided with a scale 34, which enable for indicating displacement direction and length while adjusting position.

**[0021]** The clamping plate 3 is provided at its bottom side with two rib-shaped members 35 that correspond to the slits 22 in the strap 2b and are located therein after assembly. In order to accommodate three pairs of fixing elements 5 in form of the screws the clamping plate 3 is provided with openings 36 disposed in equal distances on its upper surface that pass through the rib-shaped members 35. Locking members 37 of the clamping plate 3 are disposed in slits 22 and project at the other side of the strap 2b.

**[0022]** Furthermore the clamping plate 3 has numerous hollows in order to reduce the weight of the plate 3 and thus the load of the hinge member 1 b.

**[0023]** As shown in the drawing the shaped cuboidal guide 42 is provided with an internal thread and cooperates with the adjusting screw 41 and the strap 2 is provided with a longitudinal recesses 27 for accommodating

an edge of the retainer while the clamping plate 3 assumes different positions with respect to the strap 2 during an adjustment process.

**[0024]** Furthermore in the first embodiment of the sash hinge member 1a the shaped guide 42 is provided with two locking projections 424a extending from the position marker 422 over both walls of the guide 42 in a direction parallel to the hinge axis A. While assembling the sash hinge member 1a one needs to drive in the screw 41 in the thread of the guide 42 until the locking projections 424a of the guide 42 align with the inserting grooves 38 in the walls of the slit 32 of the clamping plate 3 (cf. Fig. 5). In this position it is possible to slide the guide 42 along with the screw 41 and the retainer 43 into the slit 32 until the screw 41 rests on the internal edges 391 of the retaining surfaces 39. By turning the screw further to the pivotal member 21 or back, e.g. to align the position marker 422 with the middle of the scale 34 the locking projections 424a leave the area of the inserting grooves 38 and all the components of the adjusting means 4 are securely coupled with the clamping plate 3.

**[0025]** Fig. 10 and Fig. 11 show the sash hinge members 1a and 1b mounted on the sash 7 profiles and pivotally coupled with frame hinge members 9a and 9b mounted on the frame 8 profiles respectively in a triple flag (Fig. 10) and in a double flag (Fig. 11) hinge assembly. As shown their straps 2 are covered with protective caps 6a and 6b.

**[0026]** In the first embodiment of the sash hinge member 1a, the protective cap 6a has been slid onto the strap 2 with its curved wall 61 overlapping an edge of the strap 2a and extending over an angular undercut 25a on the external lateral surface of the strap 2a. The position of the cap 6a has been secured by means of a screw (not shown) passing through an opening 26a in the vicinity of the pivotal member 21 and driven inside a corresponding threaded opening in the cap 6a.

**[0027]** In the second embodiment of the sash hinge member 1b, the protective cap 6b has also been slid onto the strap 2b with its curved wall 61 overlapping an edge of the strap 2b and between its longitudinal edges 24b. The position of the cap 6b has been secured by means of a shaped lock 62b made of plastic, fixed to the pivotal member 21 and cooperating with a shaped projection 63b of the protective cap 6b.

**[0028]** Obviously, many modifications and variations of the present invention are possible in light of the above teachings and may be practiced otherwise than as specifically described while within the scope of the appended claims.

#### List of reference numerals

**[0029]**

1. sash hinge member (1a, 1b)
2. strap (2a, 2b)

21. pivotal member
22. slit
- 23a. groove
- 24b. longitudinal edge
- 25a. angular undercut
- 26a. opening
27. longitudinal recess

#### 3. clamping plate

31. opening
32. slit
33. retaining groove
34. scale
35. rib-shaped member
36. opening (for a fixing element 5)
37. locking member
38. inserting groove (for a locking projection)
39. retaining surface

391. internal edge

#### 4. adjusting means

41. adjusting screw
42. shaped threaded guide (42a, 42b)
  - 421 a. projection
  422. position marker
  423. threaded opening
  - 424a. locking projection

#### 43. retainer

5. fixing element (screw)
6. protective cap (6a, 6b)

61. curved wall
- 62b. shaped lock
- 63b. shaped projection

7. sash
8. frame
9. frame hinge member (9a, 9b)

#### Claims

1. A sash hinge member (1) apt for pivotally mounting a door or a window sash (7) in a frame (8), as well as adjusting position of said sash (7) within said frame (8) comprising a strap (2) provided with a pivotal member (21) and at least two slits (22) perpendicular to the hinge axis (A); a clamping plate (3) apt to be slidably disposed in said slits (22) and having openings for fixing elements (5) preferably in a form of screws;

a protective cap (6) to cover said strap (2) after being mounted on said sash (7); and  
 adjusting means (4) for adjusting position of said sash (7) in direction perpendicular to the hinge axis (A) comprising an adjusting screw (41) and a threaded guide (42) cooperating with said screw (41);  
**characterised in that:**  
 said clamping plate (3) is provided with a longitudinal slit (32) substantially perpendicular to the hinge axis (A) and closed at both ends with retaining surfaces (39),  
 said shaped guide (42) is slidably disposed in said slit (32) of said clamping plate (3) and fixed to said strap (2), and  
 said adjusting screw (41) is disposed in said slit (32).

2. The sash hinge member according to Claim. 1, **characterized in that** said clamping plate (3) is further provided with an opening (31) for a tool applying a torque on said screw (41), collinear with the axis of the screw (41) and passing through the retaining surface (39) distal to the pivotal member (21).
3. The sash hinge member according to Claim. 2, **characterized in that** said clamping plate (3) is further provided with an annular groove (33) in the vicinity of said retaining surface (39) distal to the pivotal member (21) for accommodating a retainer (43) provided with an opening (31) for a tool applying a torque on said screw (41) and supporting said adjusting screw (41) during an adjustment process.
4. The sash hinge member according to Claim. 1 or 2 or 3, **characterized in that** said shaped guide (42) is provided with at least one locking projection (424a) extending over a wall of the guide (42) and the wall of said slit (32) in a direction parallel to the hinge axis (A), and said clamping plate (3) comprises at least one groove (38) for inserting said locking projection (424a) of said guide (42).
5. The sash hinge member according to Claim. 1 or 2 or 3 or 4, **characterized in that** said shaped guide (42a) is press fitted in the strap (2a) and preferably provided with a projection (421a) matching a groove (23a) in the strap (2a).
6. The sash hinge member according to Claim. 1 or 2 or 3 or 4, **characterized in that** said shaped guide (42b) is integral with the strap (2b).
7. The sash hinge member according to any of the preceding Claims,  
**characterized in that** said clamping plate (3) is provided with rib-shaped members (35) slidably disposed in said slits (22) of said strap (2).

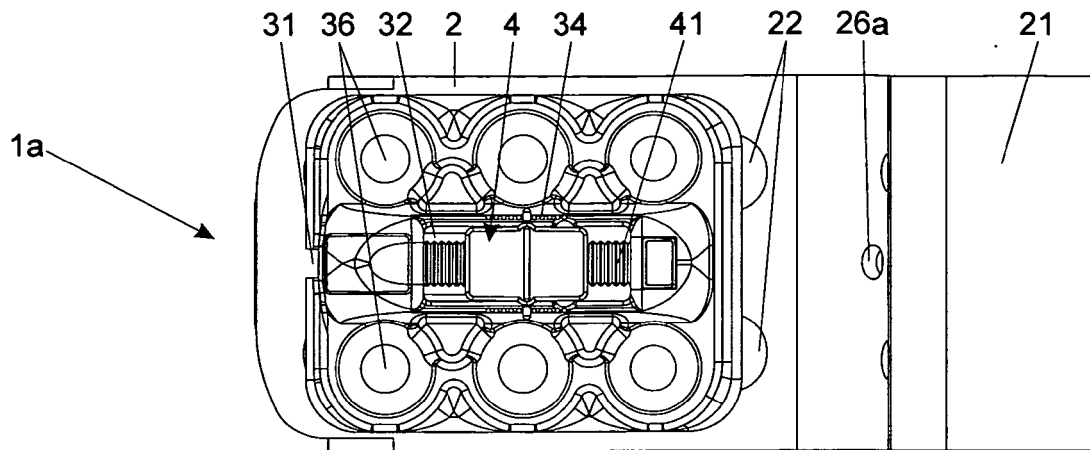


Fig. 1

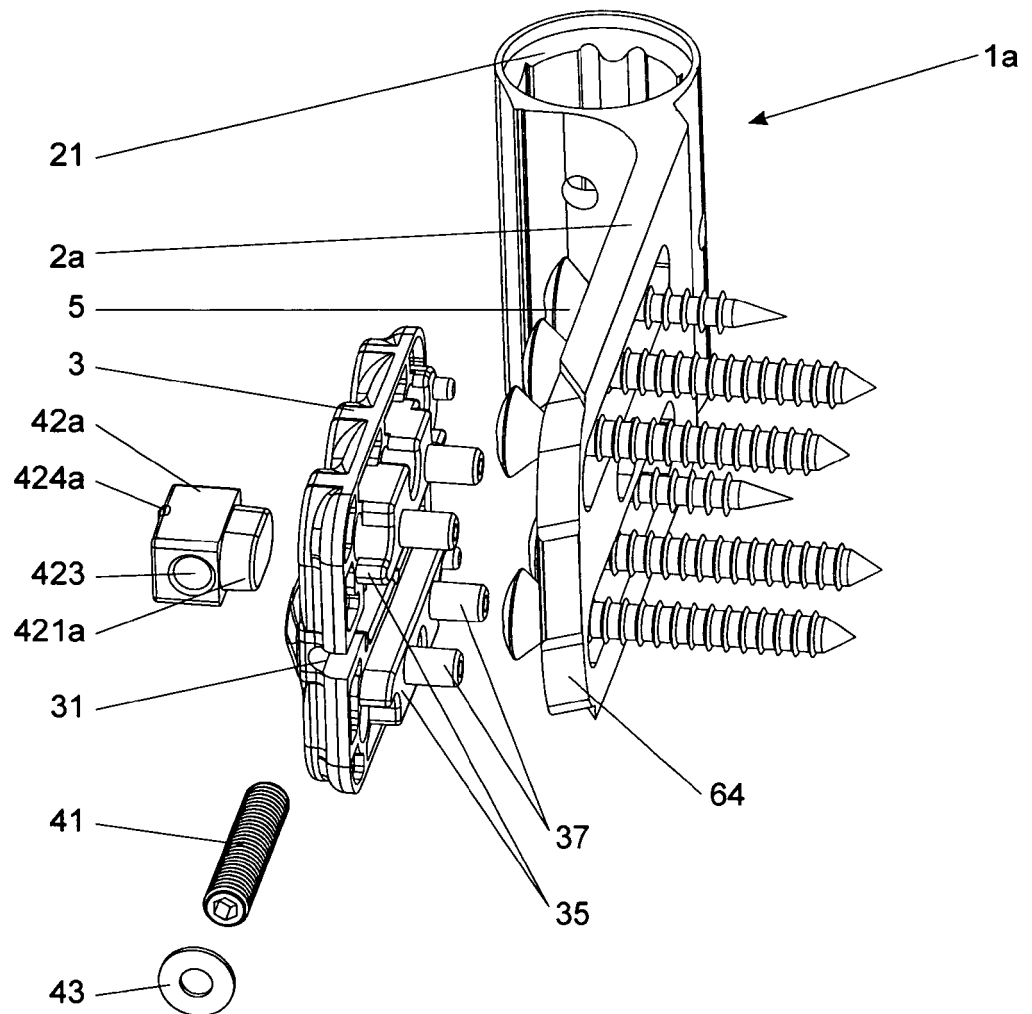
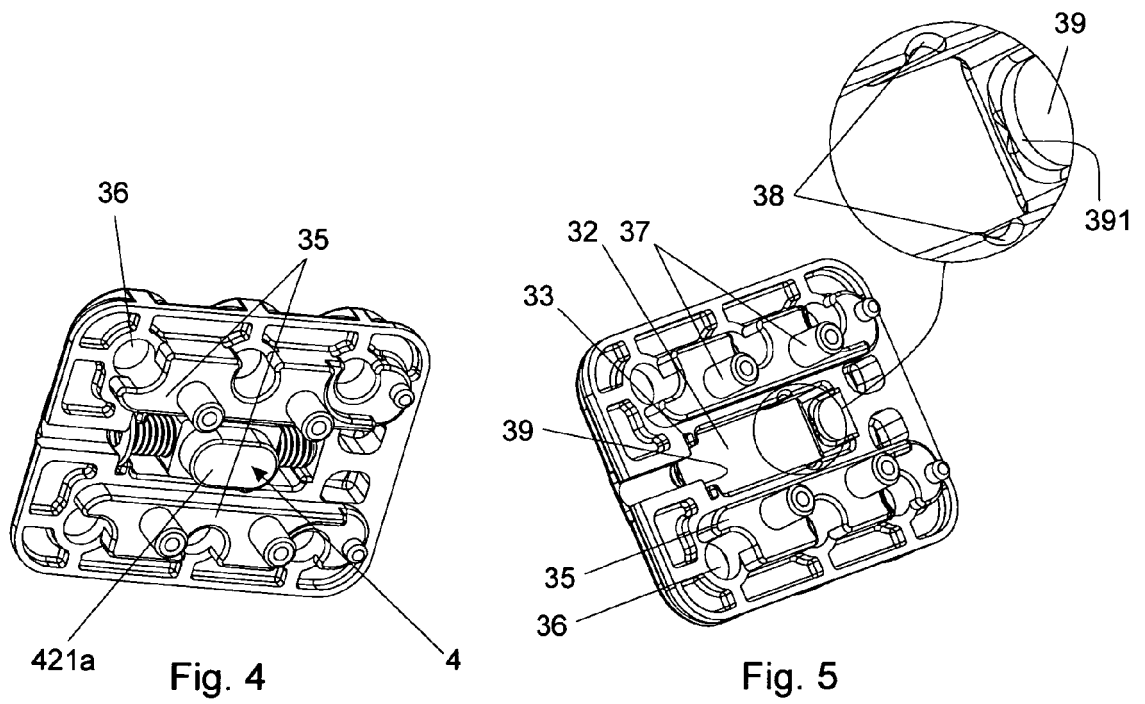
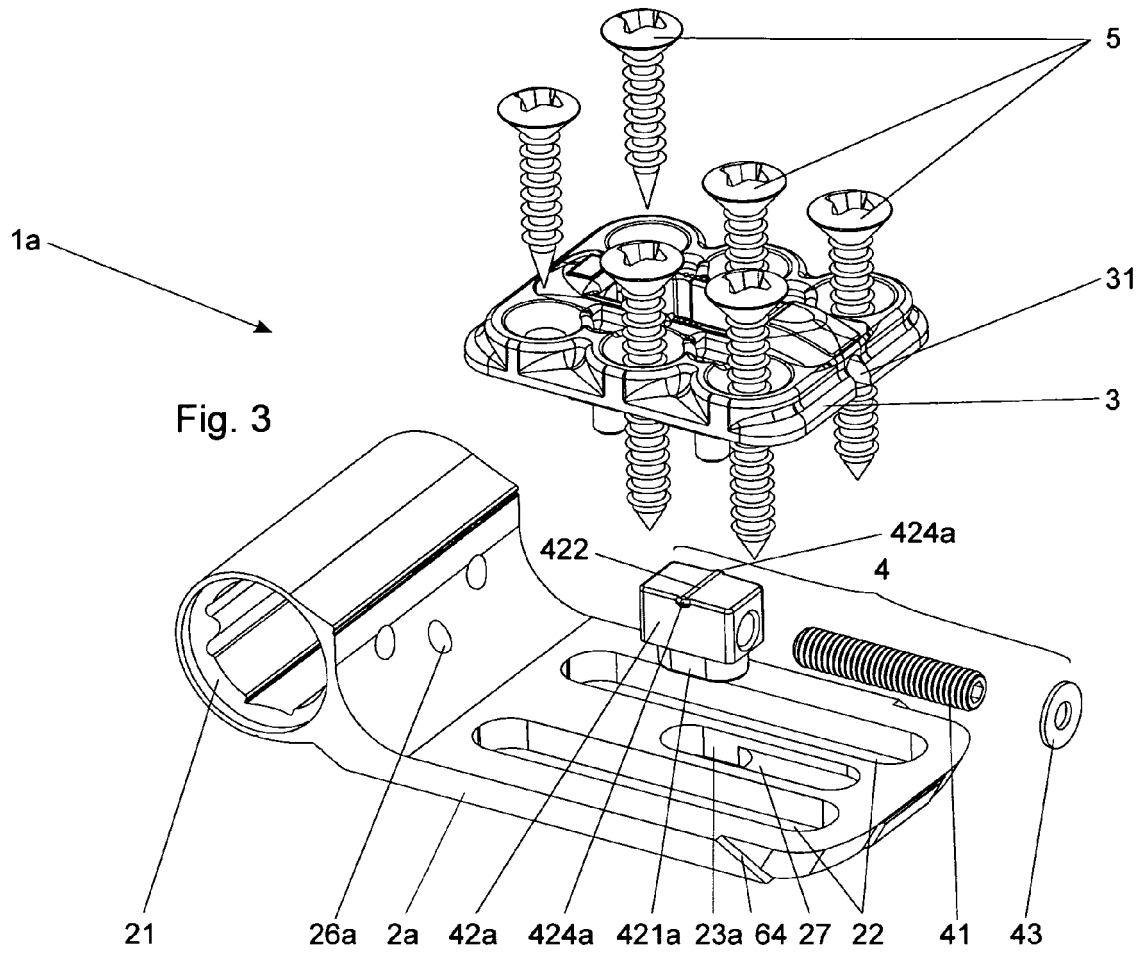
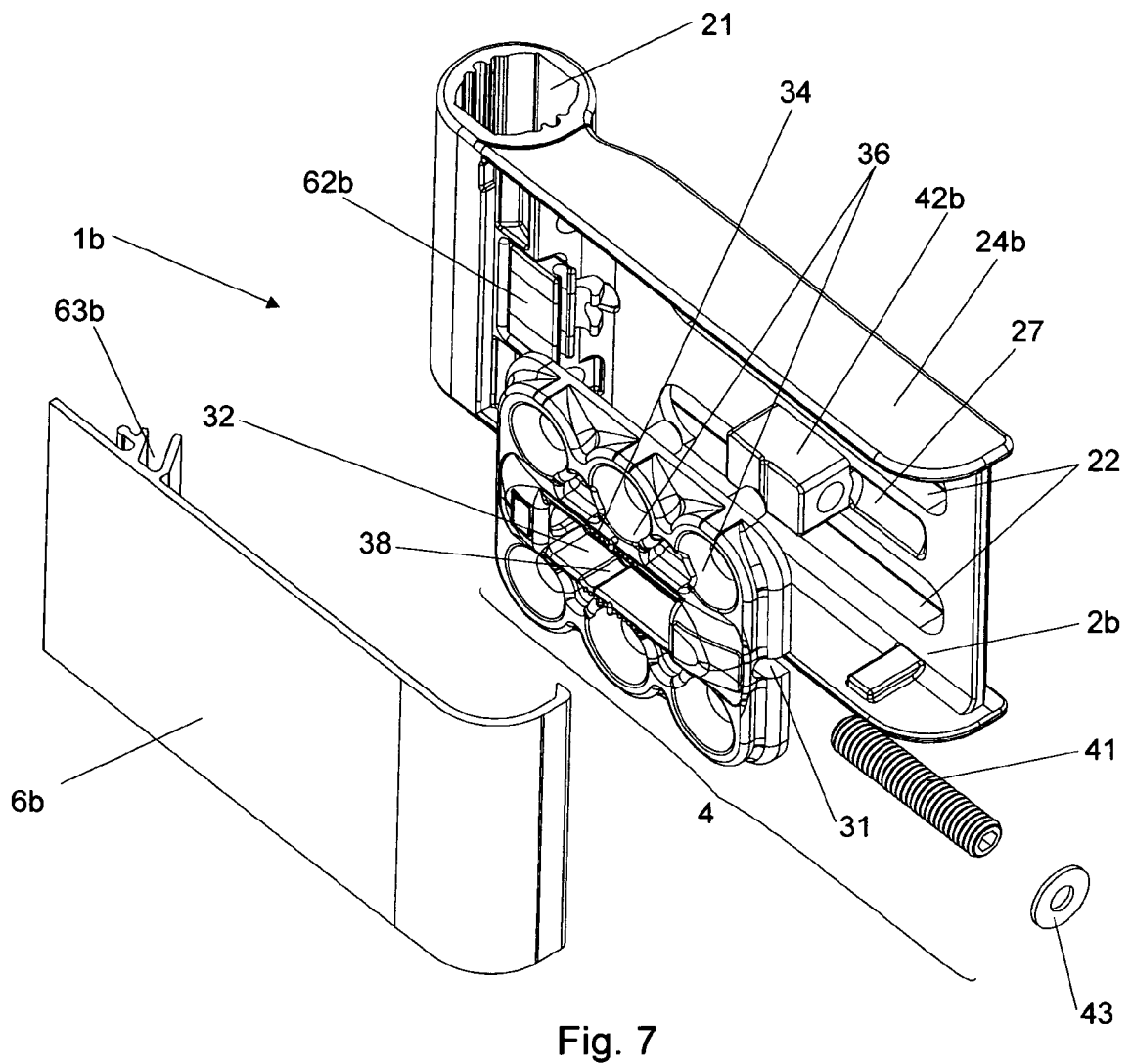
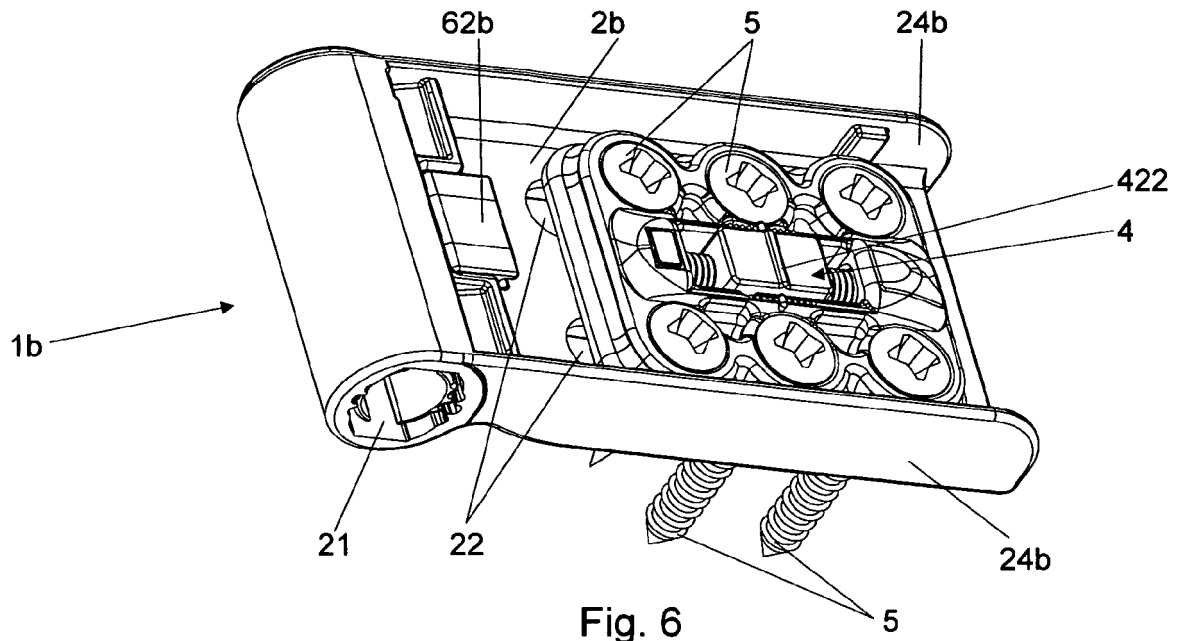


Fig. 2







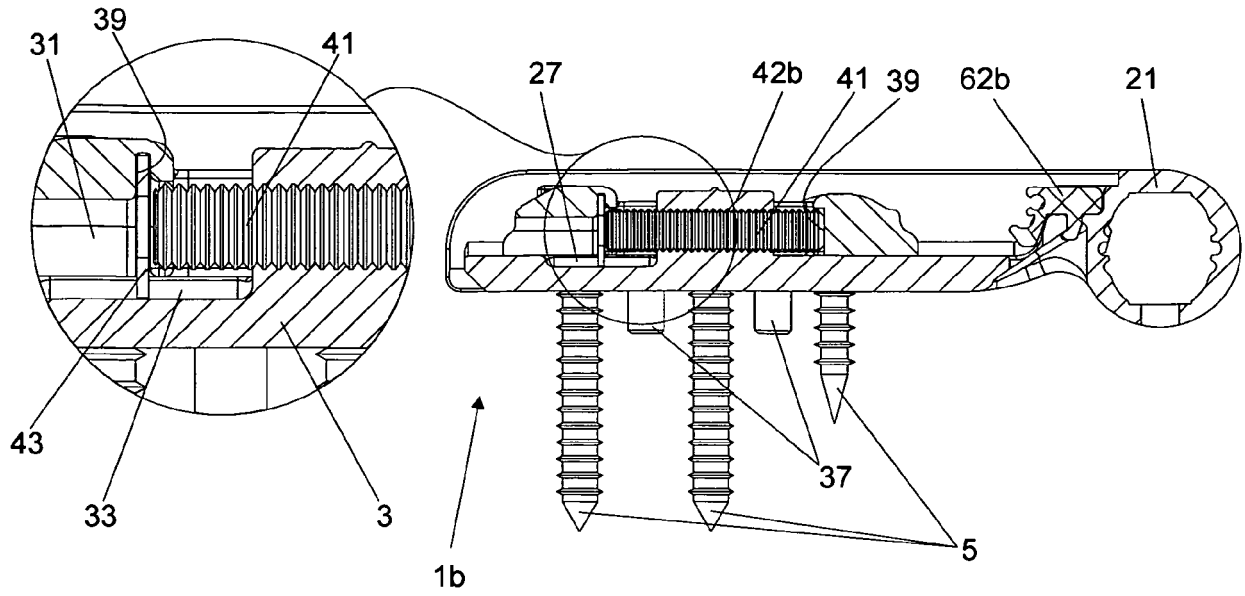


Fig. 8

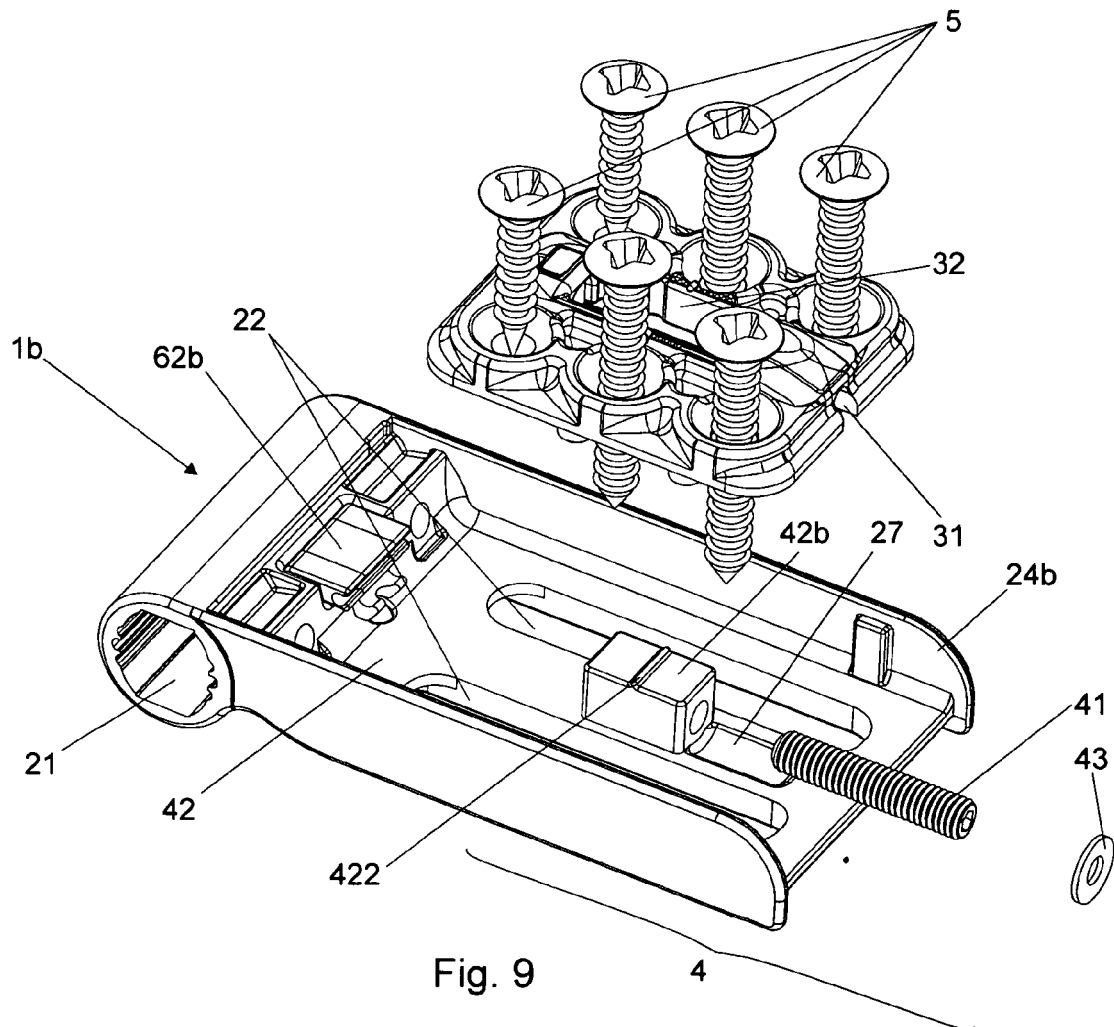


Fig. 9

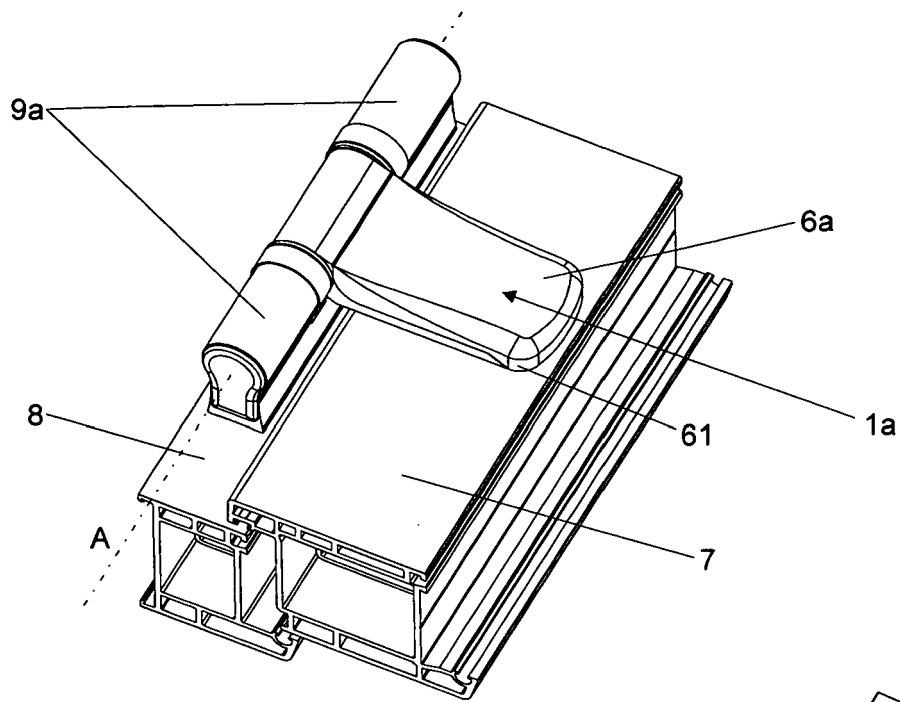


Fig. 10

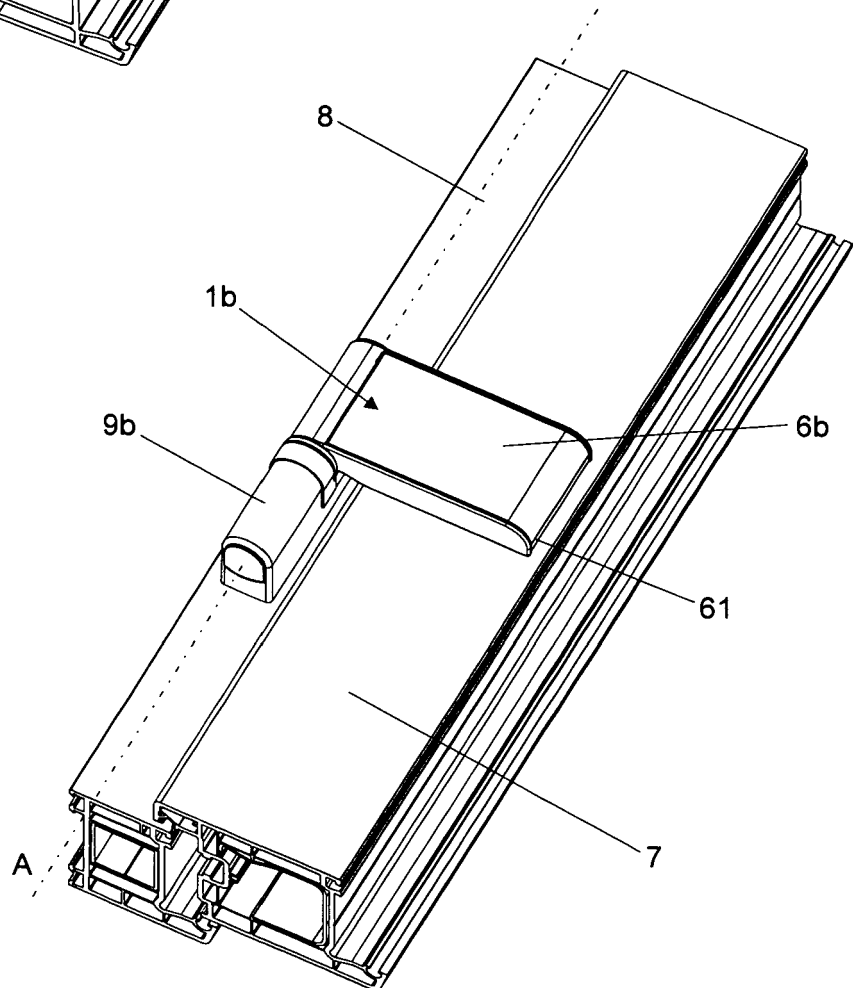


Fig. 11



## EUROPEAN SEARCH REPORT

Application Number  
EP 16 00 2670

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Y	* paragraph [0015] - paragraph [0025]; figure 1 *	4	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 April 2017	Examiner Rémondot, Xavier
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 16 00 2670

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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07-04-2017

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