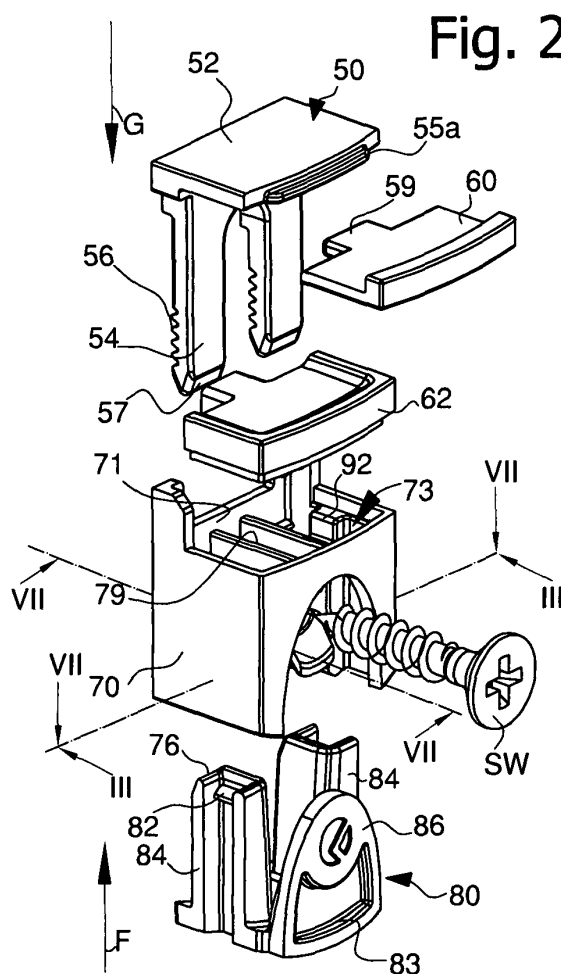


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Description

[0001] The invention refers to a fastening device for furniture shelves.

[0002] The pieces of furniture often are composed by a frame to whose interior separable horizontal shelves are placed. The shelves are fixed to the frame with particular fastening devices at the desiderate height with respect to ground.

[0003] A similar device is shown in fig. 1.

[0004] It comprises a box-like body 10 and an L-shaped member 12 that has a fork segment with a rack portion 14 to be inserted into a cavity 16 of the box-like body 10. Inside the cavity 16 there is arranged an insert 25 having a second rack portion 18 and coupled to a rubber pad 20.

[0005] The two rack portions 14, 18, after the member 12 has been introduced in the body 10, are engageable on one another in adjustable manner so that, by lifting or lowering more or less the member 12, the space between the rubber pad 20 and a horizontal plane 13 of the member 12 can receive and block the thickness of a shelf (not shown).

[0006] There is then a blocking screw 22, insertable in a pass-through hole in the body 10, having two radial teeth 24. With the screw 22 inserted in the pass-through hole, the teeth 24 are in contact with tilted planes 26 of the insert 25. By rotating the screw 22 the teeth 24 slide on the planes 26 and press the two rack portions 14, 18 on one another, so as to fix the position of the member 12 on the body 10.

[0007] The main disadvantage of this device is that necessarily a screwdriver or similar tool must be used for the regulation of the blocking. Moreover, the operation on the screw 22 is uneasy because it must occur with tight contact with the shelf. A small, not much handy tool must be used, and in conditions of insufficient practicality.

[0008] Main object of the invention is to present a device of the type described that is simpler to use. Another object is to simplify its construction.

[0009] Such objects are obtained with a device comprising

- a box-like body; and
- an L-shaped member having a rack portion;
- engagement means internal to the box-like body for engaging the rack portion in adjustable manner so that the space between the box-like body and the L-shaped member can receive the thickness of the shelf;
- a blocking member adapted to press the means of engagement and the rack portion on one another, so as to fix their mutual position, wherein the box-like body presents a cavity in which the blocking member is insertable with linear movement and on whose walls is adapted to remain firmly held, the portion of the blocking member inserted in the box-like body going with the sole action of insertion in

abutment against the rack portion and/or the engagement means so as to make them engage mutually.

[0010] Therefore the inner construction of the device is greatly simplified and the device is made manually operable, i.e. the blocking member is insertable by the user; and it can act on the rack, the engagement means or both. The action can be direct, that is with direct contact, or can exploit other movable parts.

[0011] Advantageous particular solutions, defined in the dependent claims and capable to be put into practice alone or in combination, bring further advantages.

[0012] Snapping means may be used for stabilizing the blocking member in at least two positions of progressive insertion in the box-like body: a first position in which the blocking member is only hooked to the box-like body without interacting with the rack portion or the engagement means, and in a second position, of greater insertion, in which the blocking member abuts on the rack portion and/or the engagement means. This way the blocking member may be pre-installed, in a very accessible position, ready to snap in blocking position.

[0013] The snapping means may comprise one or more positioning teeth on the blocking member adapted to fit in corresponding seats internal to the box-like body, or viceversa (teeth on the box-like body and seats on the blocking member).

[0014] The device may comprise linear guiding means for guiding the blocking member during the insertion in the box-like body. The easiness of insertion thus is improved.

[0015] A simple variant provides that the portion of the blocking member to be inserted in the box-like body be insertable substantially in parallel to the development of the rack portion, and comprises one or more tilted planes adapted to cooperate through sliding with one or more corresponding tilted planes formed on the rack portion and/or the engagement means, so as to push and make translate one of these last or both against the other in substantially orthogonal direction to the insertion direction. A simple but effective kinematic chain (based on direct contact) between the blocking member and the rack portion and/or engagement means is developed.

[0016] Preferably, the engagement means are integrated in the box-like member, by one or more teeth formed on an internal surface of the box-like body. The number of components in the device is thus minimized.

[0017] The invention and its advantages will be clearer from the following description of a favorite embodiment, together with the annexed drawing wherein

- Fig. 1 shows a known device;
- Fig. 2 shows an exploded view of the device of the invention;
- Fig. 3 shows a cross-section view according to the vertical plane III-III of fig. 2, the device is in a first configuration;

- Fig. 4 shows a cross-section view according to the vertical plane IV-IV of fig. 2, the device is in the first configuration;
- Fig. 5 shows a cross-section view according to the vertical plane III-III of fig. 2, the device is in a second configuration;
- Fig. 6 shows a cross-section view according to the vertical plane IV-IV of fig. 2, the device is in the second configuration;
- Fig. 7 shows a cross-section view according to the horizontal plane VII-VII of fig. 2;
- Fig. 8 shows an exploded view of a variant of the invention;
- Fig. 9 shows a rear view of the variant in fig. 8;
- Fig. 10 shows a cross-section view according to the vertical plane X-X of fig. 9.

[0018] The device of the invention (fig. 2) includes a box-like body 70, a L-shaped member 50, insertable in the body 70 from above (see arrow G), and a component 80 insertable in the body 70 from below (see arrow F); all three have bilateral symmetry.

[0019] The L-member 50 has two parallel fork segments 54, with a rack 56 formed thereon, perpendicular to a flat piece 52 on which a rubber pad 60 is fixed. The segments 54 can be introduced into a cavity 73 (to be understood as all the emptied part inside) of the box-like body 70 from above, and have the ends beveled so that a tilted plane 57 is formed thereon. The cavity 73 in the box-like body 70, that goes through it vertically, has a bottom wall 71 on which a stopping tooth 72 is obtained. In the side walls of the cavity 73 there are two parallel fins 92 on whose surface, at two different levels, two notches 74, 78 are formed, one facing the other. A sleeve 77 (fig. 7), that defines a passing-through, frontally flared hole to introduce a fixing screw SW therein, goes through the body 70 horizontally and centrally. Under the sleeve 77 there is a longitudinal indentation 90.

[0020] The insertable component 80 has nearly a U-shape and can be inserted into the cavity 73 from below. From a slightly bent bottom 81 thereof two C-section segments 84 extend, with the opening turned towards the outside. The segments 84 form a C-guide. Inside each of the segments 84, almost to the extremity of the free end, there is a tooth 82. At the outside of the point of the segments 84, on the side facing the wall 71, some tilted planes 76 are obtained. Frontally to the component 80 is present an extension 86, parallel to the segments 84, with an external seat 83, while centrally, between the segments 84, there is a protruding tooth 94.

[0021] Above the box-like body 70 a rubber pad 62 can be arranged, which at the bottom possesses a fin 63 that it is able to be fitted in a complementary seat 79 of the box-like body 70, seat which is formed at the top and in the body of the sleeve 77.

[0022] The rubber pad 60 can be fixed to the piece 52 for example by means of a reed 55a (fig. 2), formed in an edge of the piece 52 that can enter in a horizontal

groove 55b of the rubber pad 60, and/or the insertion of a distal tongue 59 thereof in a hole 53 of the member 50.

[0023] The operation of the device is the following.

[0024] After screwing the screw SW in the hole of the sleeve 77 and fixing thereby the box-like body 70 to the interior wall of the piece of furniture, the shelf to be supported is made to rest on the rubber pad 62. Then, the component 80 is little inserted into the box-like body 70, exploiting the guiding action created by the engagement of the C-shaped segments 84 into the fins 92 (or the component 80 can also be premounted in this position). The teeth 82 snap therefore inside the relative seats 74: in this idle position the component 80 has no blocking effect, however it remains engaged without falling from the box-like body 70, with great convenience for the user who should not worry himself to hold it. See for this configuration fig. 3 and 4.

[0025] Then, the segments 54 are inserted into the cavity 73 thus making the rack 56 advance and snap on the tooth 72. See for this configuration fig. 5 and 6. When the L-member 50 has lowered itself until the flat piece 52 (i.e. the rubber pad 60) rests on the shelf, namely the space between the rubber pads 60, 62 equals the thickness of the shelf, the component 80 is pushed completely inside the box-like body 70.

[0026] The limit stop of maximum insertion is determined by the abutment of the tooth 94 against the indentation 90, while the vertical movement is sufficient for the teeth 82 to pass into the seats 78, where they firmly stay housed and retain in position the component 80 without risk of disengagement. Simultaneously, the penetration of the segments 84 into the cavity 73 allowed the meeting and the relative sliding of the tilted planes 76 and 57, so that the segments 54 are deflected and/or moved sideways in direction of the wall 71. So, the rack 56 engages with the tooth 72, and by not being able to back for the opposition of the segments 84, it remains in stable and fixed position. Clearly, the dimensioning of the thicknesses of all the parts has to be such to allow the described actions. The extension 86 now has moved at about the middle of the body 70, thereby hiding the unaesthetic head of the screw SW.

[0027] It is noted, then, that with the invention it is not necessary to use some tool for the fixing but a finger can suffice. To unblock the device, the user has only to extract the component 80 from the body 70, by making pressure with a nail in the seat 83 to unfasten it.

[0028] The rubber pad 60 may be fixed to the piece 52 also in other manner, see variant 150 of L-member in fig. 8 and following (for the remainder analogous to the member 50). A rubber pad 160 here is provided with flexible fins 162 to be snap-fitted in a complementary, longitudinal seat 164, roughly with the shape of a V or an over-turned Ω or however preferably having bilateral symmetry, formed under a flat piece 152 of the member 150. The position of the fins can also be exchanged, that is by forming them in the piece 152 and by grooving the rubber pad 160.

Claims

1. Fastening device for furniture shelves comprising
 - a box-like body (70); and
 - an L-shaped member (50) having a rack portion (56);
 - engagement means (72) internal to the box-like body for engaging the rack portion in adjustable manner so that the space between the box-like body and the L-shaped member can receive the thickness of the shelf;
 - a blocking member (80) adapted to press the means of engagement and the rack portion on one another, so as to fix their mutual position, **characterized in that** the box-like body presents a cavity (73) in which the blocking member is insertable with linear movement and on whose walls is adapted to remain firmly held, the portion (84) of the blocking member inserted in the box-like body going with the sole action of insertion in abutment against the rack portion and/or the engagement means so as to make them engage mutually.
2. Device according to Claim 1, comprising snapping means (74, 78, 82) for stabilizing the blocking member in at least two positions of progressive insertion in the box-like body: a first position in which the blocking member is only hooked to the box-like body without interacting with the rack portion or the engagement means, and in a second position, of greater insertion, in which the blocking member abuts against the rack portion and/or the engagement means.
3. Device according to Claim 2, wherein the snapping means comprise one or more positioning teeth (82) on the blocking member adapted to fit in corresponding seats internal to the box-like body, or viceversa.
4. Device according to any of the preceding Claims, comprising linear guiding means (84, 92) for guiding the blocking member during the insertion in the box-like body.
5. Device according to Claim 4, wherein the linear guiding means comprise one or more projecting fins (92) formed in the box-like body on which one or more corresponding guides (84) formed in the blocking member are slidably engageable, or viceversa.
6. Device according to any of the preceding Claims, wherein the portion of the blocking member to be inserted in the box-like body is insertable substantially in parallel to the development of the rack portion, and comprises one or more tilted planes (57, 76) adapted to cooperate through sliding with one or more corresponding tilted planes formed on the rack portion and/or the engagement means, so as to push and make translate one of these last or both against the other in substantially orthogonal direction to the insertion direction.
7. Device according to any of the preceding Claims, wherein the box-like body has a pass-through hole in which a fastening screw (SW) to the piece of furniture is housable, and the blocking member has an extension (86) that, with the blocking member inserted, covers and hides the head of the screw.
8. Device according to any of the preceding Claims, wherein the blocking member has substantially a U form, where the branches (84) of the U are conformed for being inserted in the box-like body and present a C-section inside of which, near the extremity, a positioning tooth (82) is formed in relief.
9. Device according to any of the preceding Claims, wherein a soft bearing (60) is associated to the L-shaped member through form locking.
10. Device according to Claim 9, wherein the soft bearing presents a seat (55b) and/or a tongue (59) couplable with a corresponding tongue and/or groove (55a) formed in the L-shaped member.
11. Device according to Claim 9, wherein the soft bearing (150) presents one or more flexible fins (162) snap-fittable within a corresponding seat (164) of the L-shaped member, or viceversa.
12. Device according any of the preceding Claims, wherein the blocking member comprises a stop-limit relief (94) adapted to abut against an abutment (90) in the box-like body for defining the position of maximum insertion.
13. Device according to any of the preceding Claims, wherein the engagement means comprise one or more teeth (72) formed on an internal surface of the box-like body.
14. Device according to any of the preceding Claims, wherein the box-like body has a seat (79) and/or a rise couplable with a corresponding rise (63) and/or groove formed in a rubber pad (62) opposed to the L-shaped member.
15. Device according to Claim 14 and 7, wherein said pass-through hole is formed in a sleeve (77) internal to the box-like body, in which sleeve there is obtained said seat (79) to house the rise of the rubber pad.

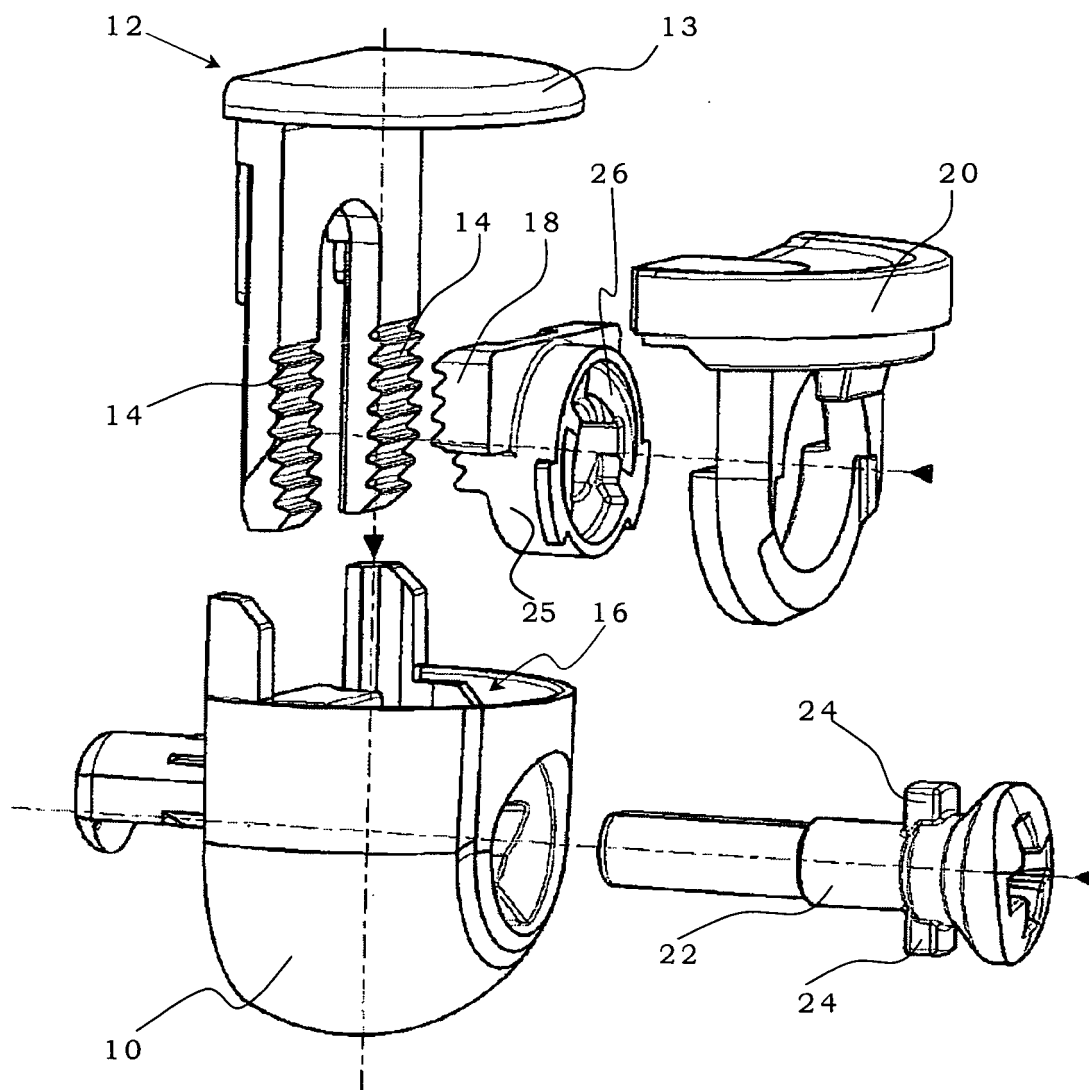


FIG. 1

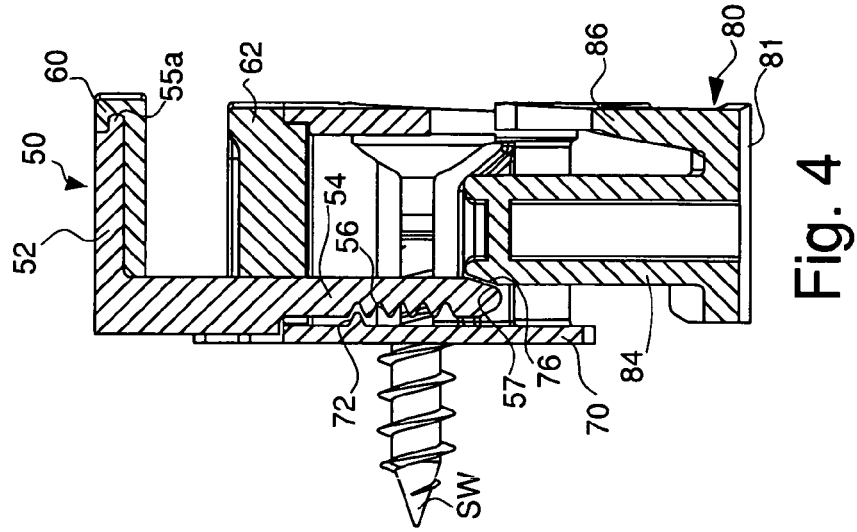
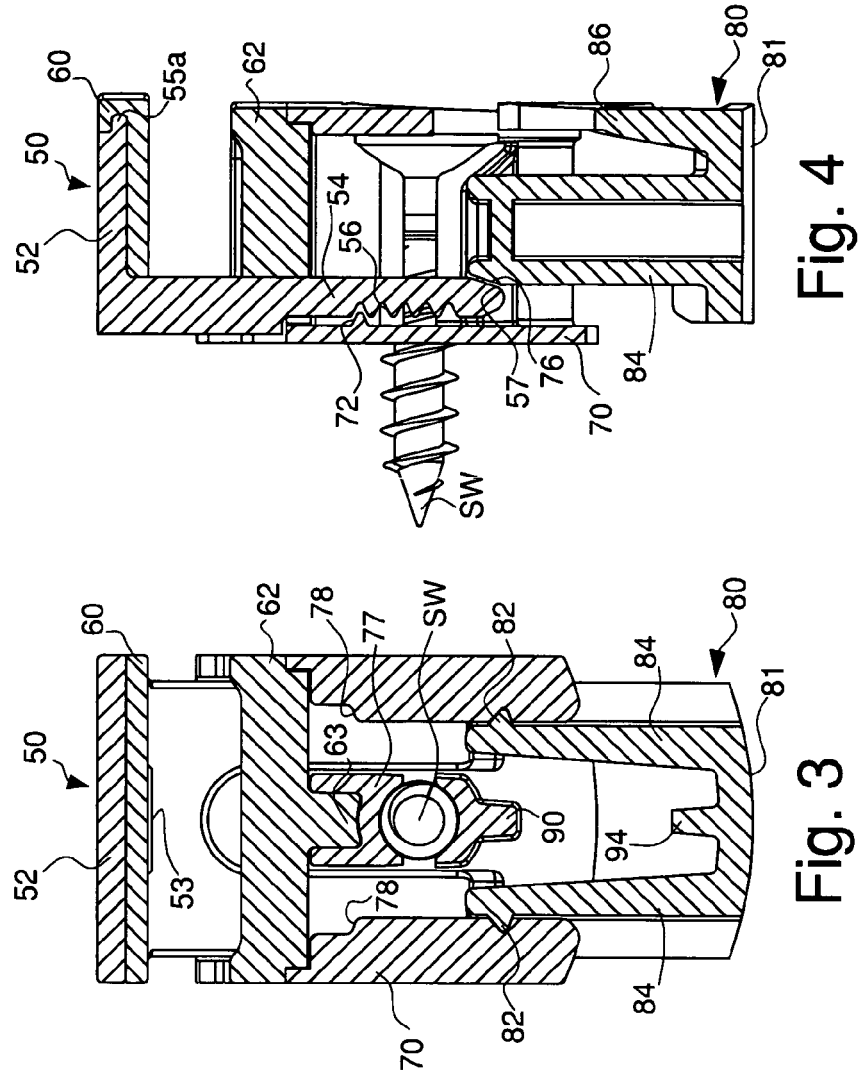
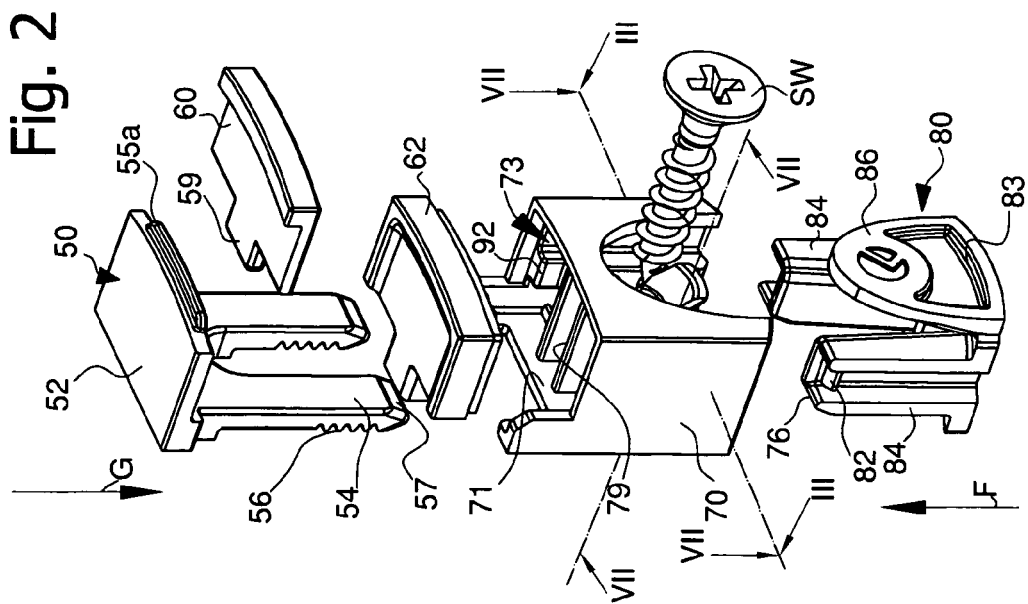


Fig. 5

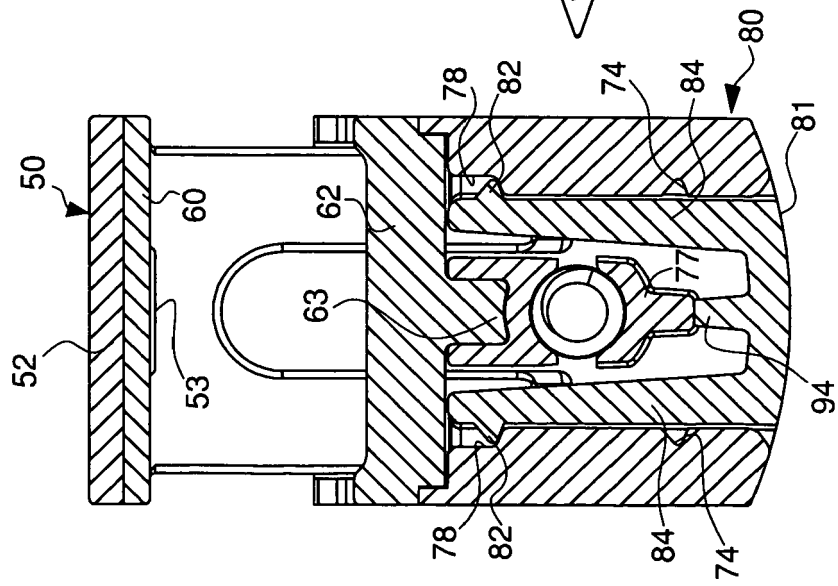


Fig. 6

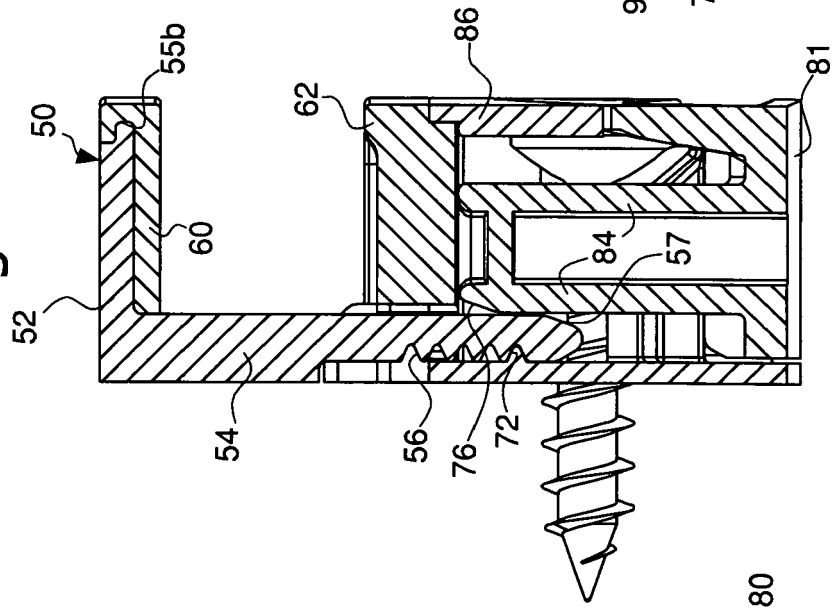
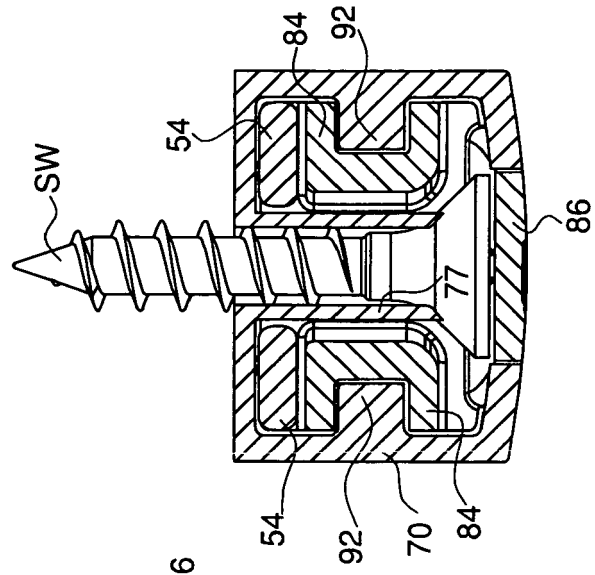


Fig. 7



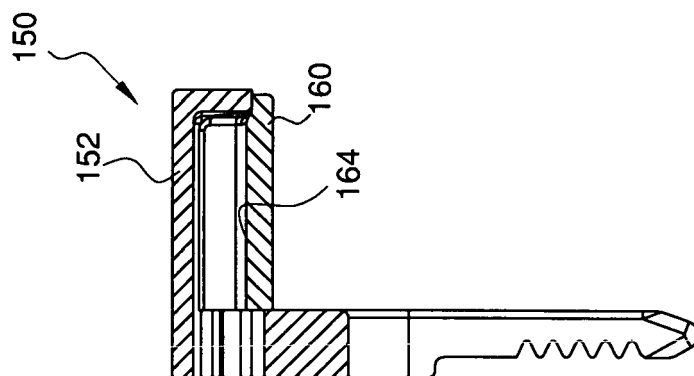


Fig. 10

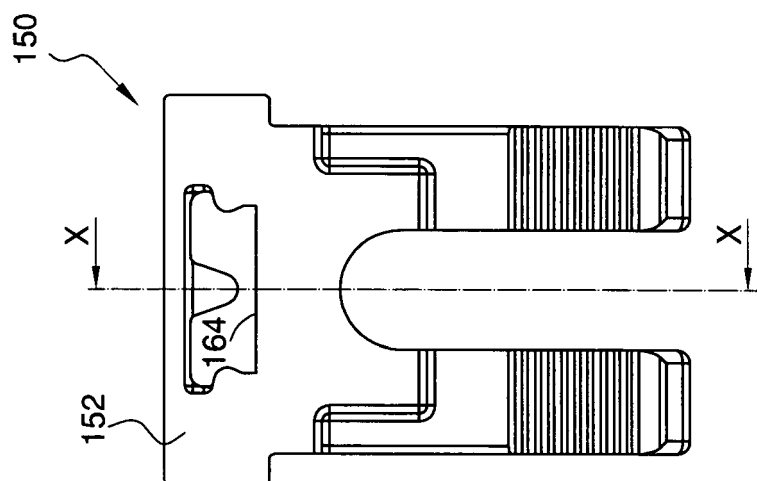


Fig. 9

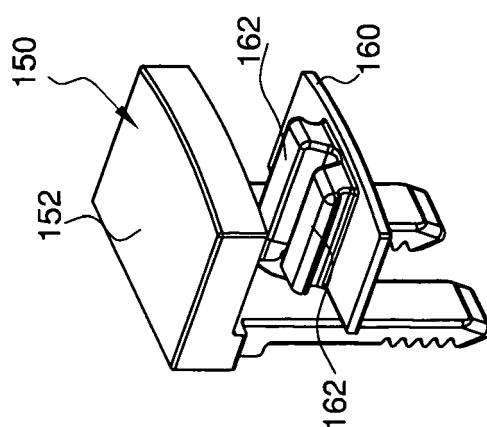


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5540

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 02/29259 A (OEHLING IVAR [SE]) 11 April 2002 (2002-04-11) * page 3, line 5 - page 5, line 9; figures 1-4 *	1-15	INV. A47B96/06
A	WO 03/068024 A (SYSTEM HOLZ SPA [IT]; POZZI ALBERTO [IT]) 21 August 2003 (2003-08-21) * page 3, line 20 - page 7, line 11; figures 1-7 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 January 2009	Examiner Klintebäck, Daniel
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			

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

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