



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.04.2010 Bulletin 2010/16

(51) Int Cl.:
A47B 96/06 (2006.01)

(21) Application number: **08425664.3**

(22) Date of filing: **14.10.2008**

(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
(71) Applicant: **Ferramenta Livenza S.r.l.**
33070 Maron di Brugnera, Pordenone (IT)

(72) Inventor: **Zonta, Christian**
33079 Marignana di Sesto al Reghena Pordenone (IT)
(74) Representative: **Giugni, Valter et al**
Propria S.r.l.
Via della Colonna 35
33170 Pordenone (IT)

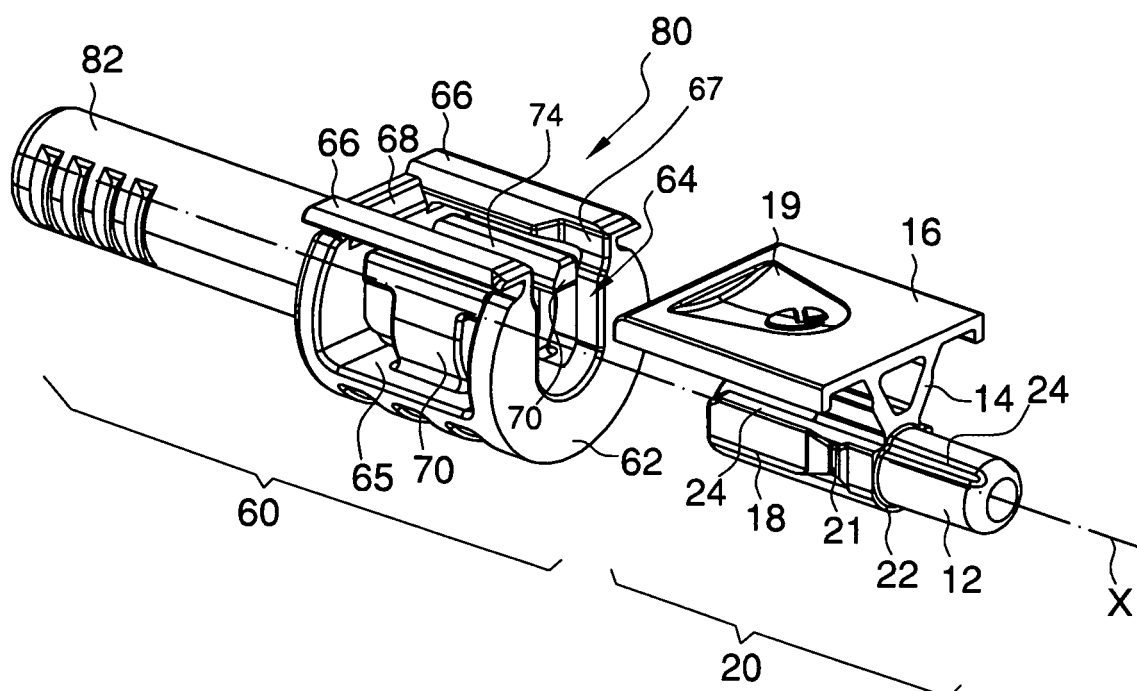
(54) **Improved fastening device for furniture shelves**

(57) A fastening device to fasten a shelf (RP) to the frame (FR) of a piece of furniture, comprising an anchoring body (60, 160) conformed to be inserted into a corresponding seat formed in the edge of the shelf; a pin member (20, 120) housable in an internal cavity (64, 164) of the anchoring body and sliding in it along an axis (X; 1X) between two positions wherein a head (12, 112) of

the pin member protrudes or not from a side (62, 162) of the anchoring body in order to enter into, or to come out from, a hole (H) in the frame.

To simplify the use of the device, there is a slider (16, 116) that is movable externally to the anchoring body in a direction parallel to said axis and is coupled to the pin member to move it between those two positions.

Fig. 1



Description

[0001] The invention relates to an improved fastening device for fastening a shelf to a furniture frame.

[0002] A piece of furniture usually consists of a chassis or frame to which doors and horizontal shelves are fixed. To connect the shelves to the frame it is known to use special fastening devices which facilitate the assembly thereof and avoid accidental detachment e.g. during a move.

[0003] EP 1 228 721 discloses a similar device, consisting of a cylindrical anchoring body and a pin housed in a inner cavity of the first. The body has to be inserted in a corresponding seat made by drilling in the edge of the shelf, and therefore remains integral with it. The pin is sliding inside the anchoring body along a longitudinal axis between two positions in which a head thereof protrudes or not from the edge of the shelf in order to get inserted into, or to come out from, a hole in the frame. The pin is pushed into the maximum projection position by a spring, while the engagement of snapping means formed by interacting parts of the pin and the anchoring body allows the pin to be temporarily blocked and completely retracted inside the anchoring body.

[0004] The pin has a side tooth confined and sliding into an elongated slot formed in a side wall of the anchoring body. The slot is large about 1 mm. By pushing the tooth with the tip of a screwdriver the strength of the spring can be overcome and the head of the pin is withdrawn inside the anchoring body, where it remains blocked thanks to the snapping means. Once this is done for all the devices of a shelf, it can be detached from the frame.

[0005] Considering that the device is placed at the lower edge of the shelf, when it is mounted on the frame it is not very easy to use a sharp tool to disengage it, mainly because of the very small slot. And even only having to use a tool is inconvenient.

[0006] The object of the invention is to make a device of the type described which is easier to use. Another object is to avoid the use of tools. Another object is to improve the aesthetics of the device.

[0007] These objects are achieved with a device with the characteristics of claim 1.

[0008] The device of the invention provides for a slider that is movable outside of the anchoring body in parallel direction to said axis and is coupled to the pin member to move it between said two positions, manually (without tools) and easily.

[0009] When the pin member comprises an extension perpendicular to said axis that extends up to the outside the anchoring body, where it forms said slider, a simple but effective construction of the pin member is achieved. To increase the accessibility of the slider for the user's hand, it is preferred that, with respect to the extension, the slider extends in direction opposite to the head of the pin member.

[0010] To allow the insertion of the pin member in the cavity, said cavity is open continuously outwards starting

from the side from which the pin member head comes out up to another side, so as to form a lateral opening on the side of the anchoring body.

[0011] Other variants of the invention, which include various combinations of these and other advantageous solutions, are defined in the dependent claims.

[0012] The invention and its advantages will be clearer from the following description of preferred embodiments, together with the attached drawings in which

Fig. 1 shows a three-dimensional view of a device according to the invention;

Fig. 2 shows the three-dimensional view of fig. 1 in vertical cross-section;

Fig. 3 shows a side view of the device in fig. 1;

Fig. 4 shows a cross-sectional view of the device in fig. 1 according to the plane IV in Fig. 3 in a first configuration;

Fig. 5 shows a cross-sectional view of the device in fig. 1 according to the plane IV in Fig. 3 in a second configuration;

Fig. 6 shows a vertical cross-sectional view of the device in fig. 1 in the first configuration;

Fig. 7 shows a vertical cross-sectional view of the device in fig. 1 in the second configuration;

Fig. 8 shows a three-dimensional view of a second device according to the invention;

Fig. 9 shows the three-dimensional view of fig. 8 in vertical cross-section;

Fig. 10 shows three-dimensional view of a third device according to the invention;

Fig. 11 shows the three-dimensional view of fig. 10 in vertical cross-section;

Fig. 12 shows a side view of the device in fig. 10;

Fig. 13 shows a cross-sectional view of the device in fig. 10 according to the plane XIII in Fig. 12 in a first configuration;

Fig. 14 shows a cross-sectional view of the device in fig. 10 according to the plane XIII in Fig. 12 in a second configuration.

[0013] The device in Figures 1-7 is formed by two cooperating parts: a pin member 20 and an anchoring body 60, which is composed of a front portion 80 and a rear portion 82. The pin member 20 is sliding into the body 60 along a longitudinal axis X, axis along which the major dimensions of the device develop. The device is also symmetrical with respect to a vertical plane passing through X, thus sometimes only one side will be described.

[0014] The pin member 20 is made up of a cylindrical pin head 12, elongated along the axis X, from which, again along the X axis, a partially hollow tubular body 18 extends. On the body 18 are present, one on each side, raised teeth 21 in relief. In the body 18 and in the head 12 there are continuous horizontal raised surfaces 24, similar to a step. Through a spacing structure 14, which develops orthogonally to the axis X, the end of the head

12 is integrally connected to the end of a flat plate 16, arranged parallel to the axis X and having a concave surface 19. As a result, the plate 16 extends in direction opposite to the head 12. The lower part of the head 12 is made up of a rounded base 22.

[0015] The front portion 80 has approximately an over-turned-Ω vertical cross-section and locates in its inside a cavity 64, which develops in the direction of the axis X and opens without interruption on a front face 62 and on an adjacent side, whose edges are made of two flat parallel portions 66 connected in the center by an inclined plane 68. The portions 66 are tapered near the face 62 at a local surface enlargement 67 of the cavity 64.

[0016] The inside of the portion 80 is thus emptied by the cavity 64. On both sides the portion 80 presents an opening, of width almost equal to the total length, in the middle of which there is a tab or lug 70, which extends from the bottom 65 of the cavity 64 and is curved inwards at the ends thereof to form a tooth or hook 72. The inner part of the tooth 72 facing the flat portions 66 is chamfered to form an inclined plane 74, while the bottom 65 has a concavity corresponding to the convexity of the rounding 22. Note that the body 18 has an inclined plane 23 at its lower end, the one near the bottom 65.

[0017] The width of the tab 70 is less than the opening it occupies, so on the sides there remain two empty spaces or through-seats 78.

[0018] The cavity 64 extends inside the portion 82, which practically results in a hollow cylinder with a closed base.

[0019] Turning to Figures 3-7, the coupling between the pin member 20 and the anchoring body 60 can be seen.

[0020] Imagine the anchoring body 60 fixed in the edge of a shelf RP (as in Fig. 6) and the pin member 20 with its head 12 inside a hole H in a frame FR of a piece of furniture. The two parts are brought closer until the rounded part 22 of the head 12 is in contact with the inclined planes 74. Then the pin member 20 is inserted with pressure inside the cavity 64, along a direction orthogonal to the axis X.

[0021] At this stage, cooperation between the enlargement 67 and teeth 21 and between the inclined planes 23, 68 develops.

[0022] The enlargement 67 matches with the teeth 21 during said insertion. By increasing the size of the cavity 64 along the path of the teeth 21, excessive pressure is prevented on the walls of the body 80, which could break upon enlarging too much. Simultaneously the inclined planes 23, 68 get nearer and can slide over each other for directing the pin member 20 into the cavity 64 if the first was slightly misaligned with the second along the axis X.

[0023] The tabs 70 divaricate, let the portion 22 pass, and shortly afterwards snap closed again. The teeth 72 abut on the surfaces 24 and retain the pin member 20 in the cavity 64, in which however it can slide along the axis X. Note that the surfaces 24 behave as guiding means

for the pin member 20, which ends up to be driven by the teeth 72.

[0024] The base 22 rests perfectly and slides on the bottom 65 of the cavity 64. A user can adjust the position of the pin member 20 through operation on the plate 16 (the concavity 19 is a notch for the nail), by moving it between two positions (see fig. 6 and 7).

[0025] When the pin member 20 is retracted in the cavity 64, the head 12 does not protrude from the front face 62, and the shelf RP is loose (Fig. 7). The teeth 21 snap-fit in a seat 78 where they retain the pin member 20 in place. The abutment of the structure 14 on the plane 68 defines a travel limit for the member 20 inside the cavity 64.

[0026] By pushing the plate 16, the head 12 is pushed out of the anchoring body 60 (Fig. 6) to make it enter into the hole H and thus fix the shelf RP. The teeth 21 come out from the seat 78 they are in and snap-enter in the adjacent one (Fig. 5). The distance between the seats 78 engaged by the teeth 21 is equal to the determined stroke for the head 12. Note that the structure 14 allows the plate 16 to slide without difficulty onto the flat portions 66 at the right distance from the member 20.

[0027] In Figures 8 and 9 is shown a variant of the device. Equal references indicate equal and functionally identical parts to previous ones. The difference is the presence of a spring 90 placed inside the cavity of the rear portion 82 and inside the cavity 64. A head of the spring 90 is housed inside the cavity of the body 18. The spring 90 serves to push the member 20 outside the body 60, so that the head 12 protrudes from the face 82 (the pin 20 however is always kept stable in two positions by the teeth 21).

[0028] In fig. 10 and following is shown a second variant of the device, in which equal and functionally identical parts to the previous ones are designated by the same numbers plus a prefix "1", and they will not be described again unless necessary.

[0029] The device is formed by two cooperating parts: a pin member 120 and an anchoring body 160. The pin member 120 is sliding in the anchoring body 160 along a longitudinal axis 1X, axis along which also the major dimensions of the device develop. The device is also symmetrical with respect to a vertical plane passing through 1X, thus sometimes only one side will be described.

[0030] The pin member 120 consists of a cylindrical pin head 112, elongated along the axis 1X, from which, still along the axis 1X, extend two parallel and flexible tabs 117 provided to their end of a teeth 121 turned outwards. The long sides of the tabs 117 constitute raised surfaces 125 in the head 112, about a step.

[0031] A recess 164 in the body 160 extends inside the portion 182, which is practically a hollow cylinder with a closed base. On the lateral surface of the portion 182 there are two openings 184, one facing the other.

[0032] Turning to Figures 12-14, the coupling between the pin member 120 and the anchoring body 160 can be

noted which distinguishes this variant (all the rest being equal to the previous one).

[0033] When the pin member 120 is pressure-inserted inside the cavity 164 orthogonally to the 1X axis (as before), the tabs or fins 170 divaricate, let the head 112, the base 122 and the rounded tabs 117 pass, and shortly afterwards snap-close. The teeth 172 abut on the surfaces 125 of the tabs 117 and retain the member 120 in the cavity 164, wherein it can slide along the axis 1X. Note that the surfaces 125 act as guiding means for the member 120, which turns out to be guided by the teeth 172.

[0034] When the pin member 120 is retracted inside the cavity 164, the head 112 does not protrude from the front side 162, and the shelf is released. The tabs 117 are inserted in the hollow part of the rear portion 182, and their teeth 121 snap-fit in the seats 184 where they retain in place the pin member 120.

[0035] By pushing the plate 116, the head 112 gets pushed outside the anchoring body 160 to make it enter into the hole of the cabinet and to fasten the shelf. The teeth 121 disengage from the seats 184 and snap-enter into the closest of the seats 178. The distance between the seats engaged by the teeth 121 is equal to the established stroke for the member 120.

[0036] It may be seen that between the fins 117 and along the axis 1X one could place a spring (as the spring 90 of fig. 8).

[0037] One recognizes that the invention has the great advantage of adjusting the position of the pins 12, 112 manually, without tools and in a very simple manner.

[0038] Another advantage of the invention is that by shifting of the plates 16, 166 to insert the pins 12, 112 in the hole H, they also cover the portion of the body 160 (i.e. the edges 66, 166 and the cavity 64, 164) which remains in view on the shelf RP.

Claims

1. Fastening device for fastening a shelf (RP) to the frame (FR) of a piece of furniture, comprising

- an anchoring body (60, 160) conformed to be inserted into a corresponding seat formed in the edge of the shelf;
- a pin member (20, 120) housable in an internal cavity (64, 164) of the anchoring body and sliding in it along an axis (X; 1X) between two positions wherein a head (12, 112) of the pin member protrudes or not from a side (62, 162) of the anchoring body in order to enter into, or to come out from, a hole (H) in the frame,

characterized by comprising a slider (16, 116) that is movable externally to the anchoring body in a direction parallel to said axis and is coupled to the pin member to move it between said two positions.

2. Device according to claim 1, wherein the pin member comprises an extension (14, 114) orthogonal to said axis which extends up to the outside of the anchoring body, where it forms said slider.

3. Device according to claim 1 or 2, wherein with respect to the extension the slider extends in direction opposite to the pin member head.

4. Device according to any of the previous claims, wherein the slider is a flat member (16, 116) and is slidable over a portion of outer surface (66, 166) of the anchoring body.

5. Device according to claim 4, wherein said cavity is open outwards continuously starting from the side (62, 162) from which the pin member head exits up to said portion of outer surface, the cavity being such as to form a lateral opening on the anchoring body so as to allow the insertion of the pin member in the cavity with a movement orthogonal to said axis.

6. Device according to claim 5, comprising inside said cavity one or more flexible tabs (70, 170) adapted to divaricate elastically during the insertion of the pin member and to immediately snap back for slidably restraining it in the cavity.

7. Device according to claim 6, wherein a or each flexible tab comprises a holding tooth (72, 172) for the pin member, and the pin member comprises a guiding surface (24; 125), the tooth and the guiding surface being shaped to engage each other by shape-coupling in order to retain the pin member in the cavity.

8. Device according to claim 7, wherein the tooth comprises an inclined plane (74, 174) placed near the lateral opening and shaped to make the respective tab bend when, during the insertion of the pin member, it presses thereagainst.

9. Device according to any of the previous claims, wherein on the pin member, or in the cavity, there are holding projections (21, 121) adapted to snap into corresponding seats (78, 178, 184) formed in the anchoring body, or in the pin member, for keeping in place the pin member, the axial distance between said seats being equal to the stroke of the pin member in the anchoring body.

10. Device according to claim 9, wherein the pin member comprises flexible fins (117) extending in direction opposite to the head thereof (112) and on which there are provided said projections (121).

11. Device according to claim 9 or 10, wherein said projections (21) comprise one or more teeth (21) on the

lateral surface of the pin member (20).

12. Device according to claim 5 and 11, wherein said cavity at the side (62, 162) from which the pin member head comes out presents enlargements (67) 5 which, during the insertion of the pin member in the anchoring body, guide said one or more teeth (21) toward the cavity's inside.
13. Device according to any of the previous claims, 10 wherein the pin member comprises a curved surface (22, 122) adapted to slide during insertion into the anchoring body on the inclined planes of said fins in the anchoring body, thereby forcing the divarication thereof. 15
14. Device according to any of the previous claims, wherein the end of the pin member (18, 117) opposite to the head thereof comprises an inclined plane (23, 123) adapted to be able to slide on an inclined plane 20 (68, 168) formed on the edge of said lateral opening during the insertion of the pin member into the anchoring body.
15. Device according to any of the previous claims, 25 wherein the portion of the pin member opposite to the head thereof comprises a cavity for housing and/or forming an abutment for a spring housed in an axial cavity of the anchoring body and adapted to push the pin member toward the position wherein 30 its head protrudes.

35

40

45

50

55

Fig. 1

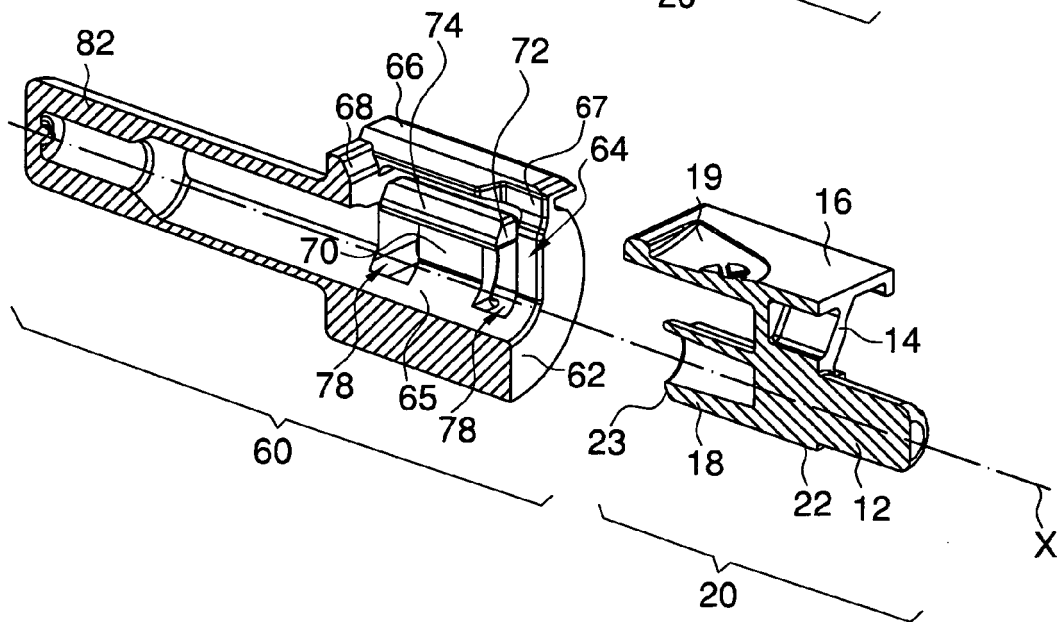
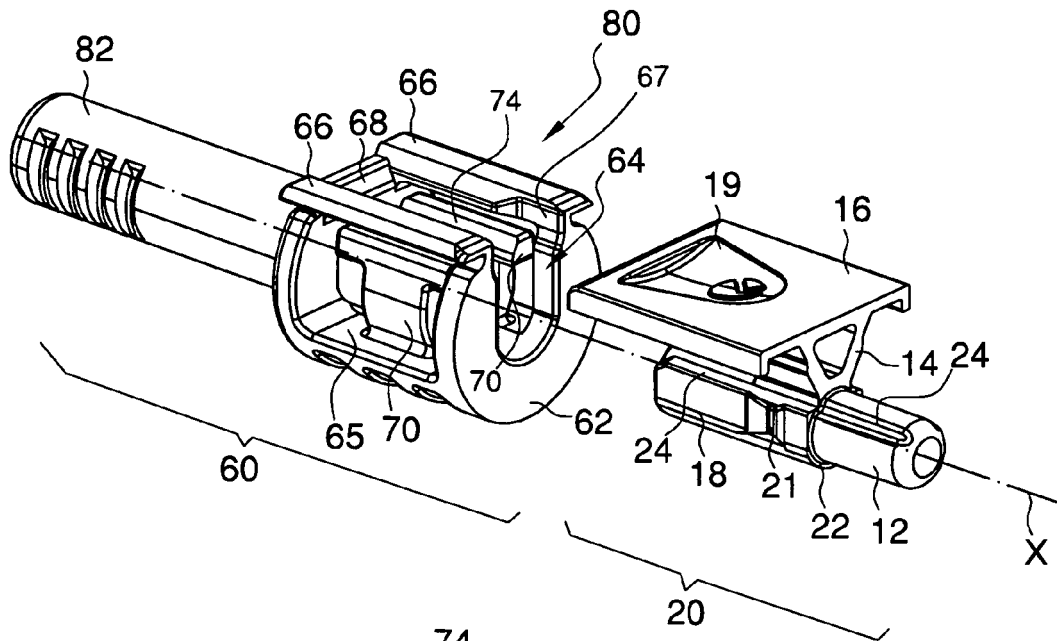


Fig. 2

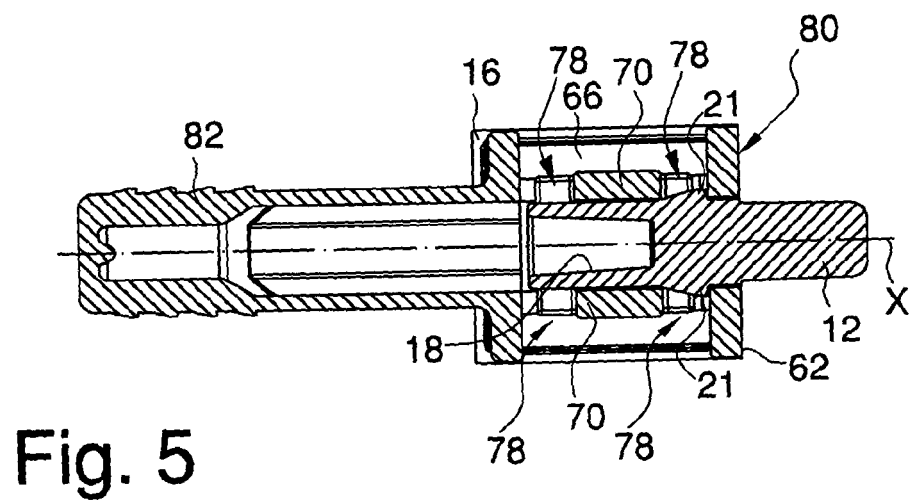
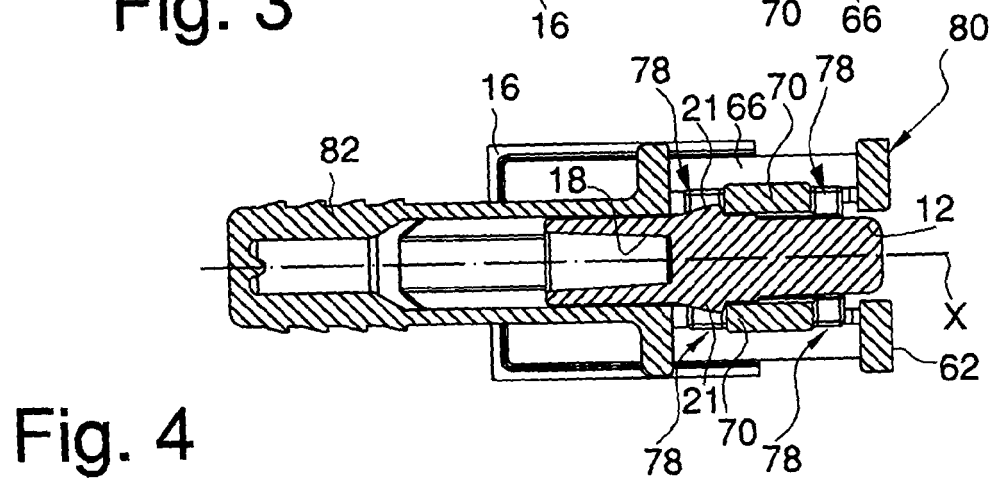
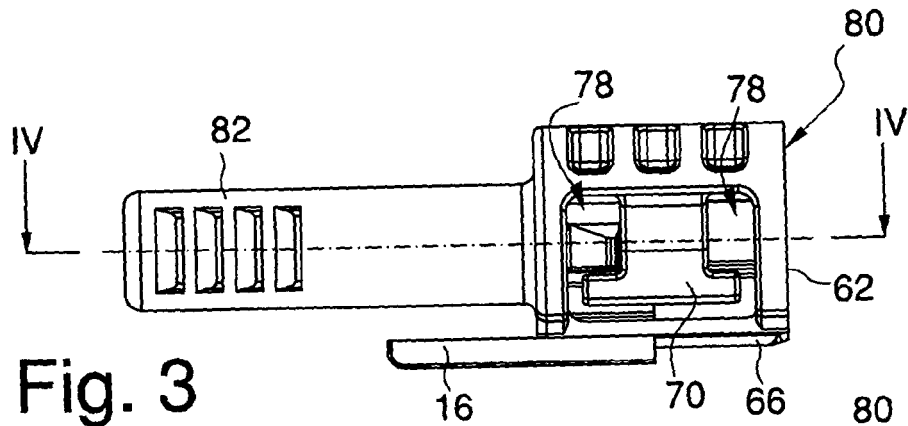


Fig. 6

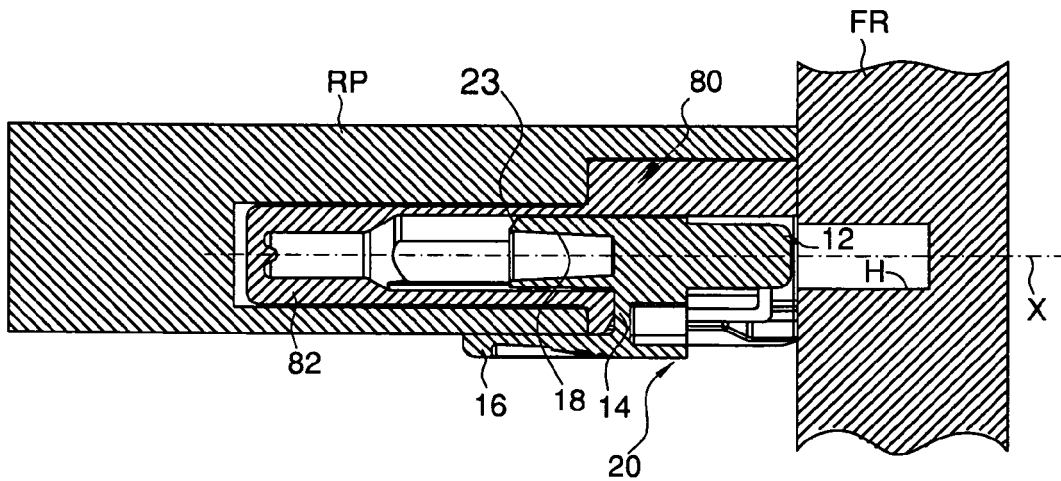
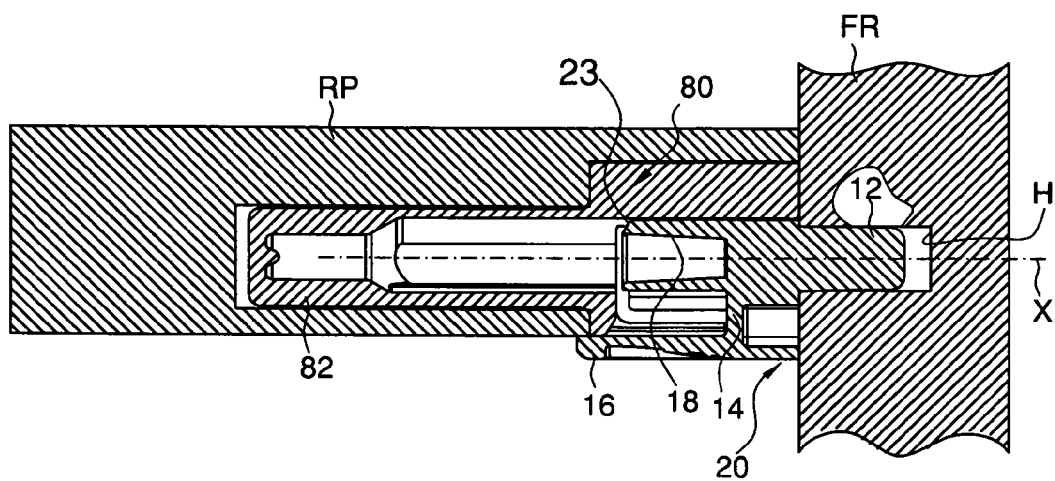


Fig. 7

Fig. 8

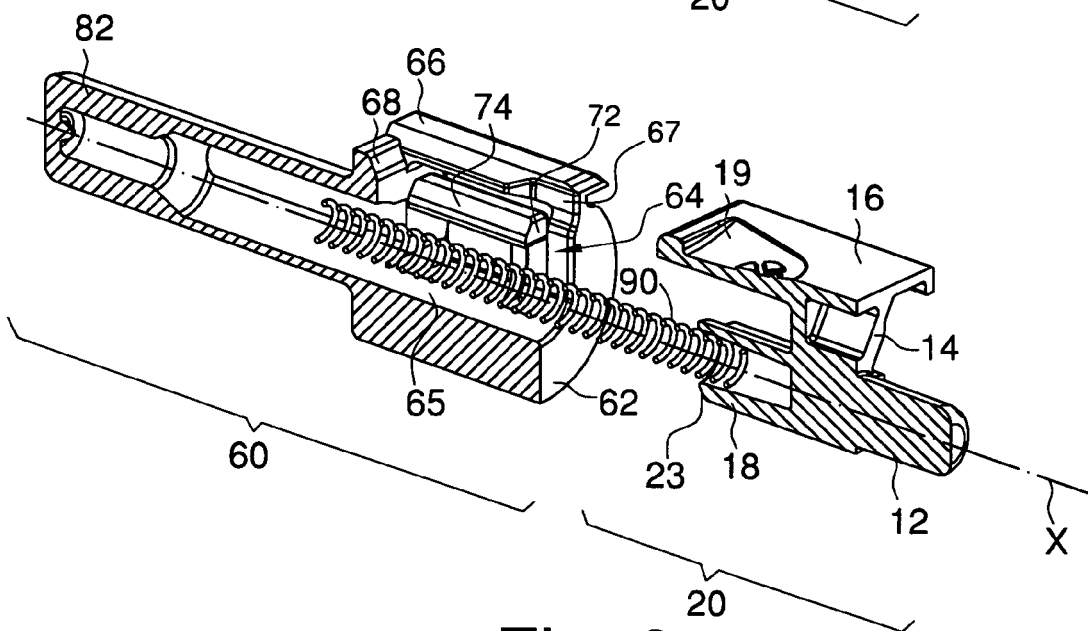
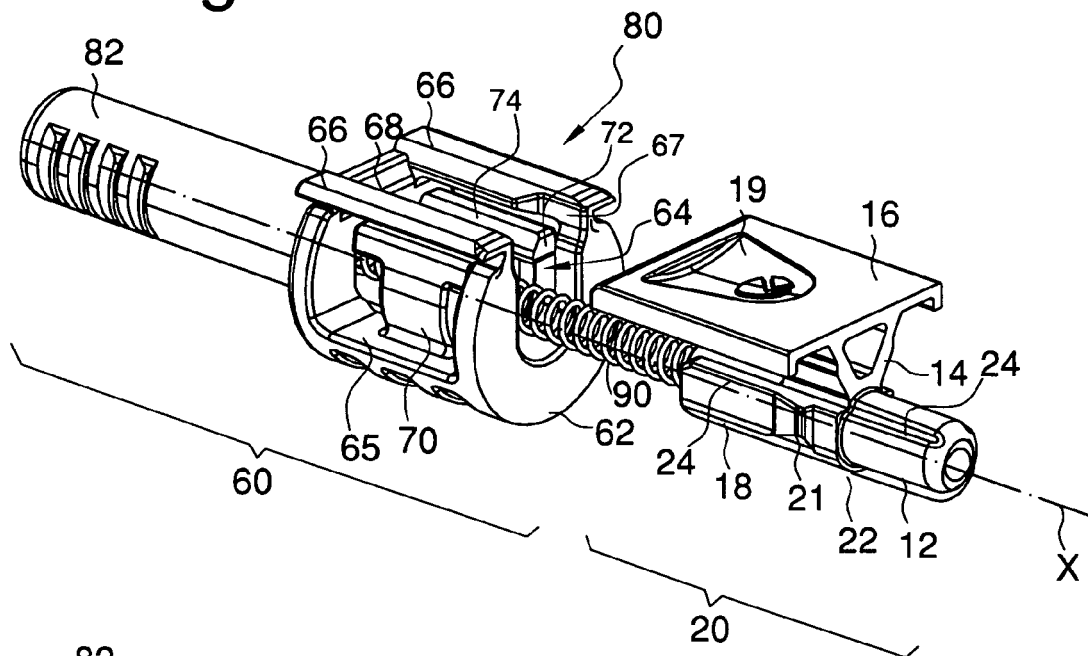


Fig. 9

Fig. 10

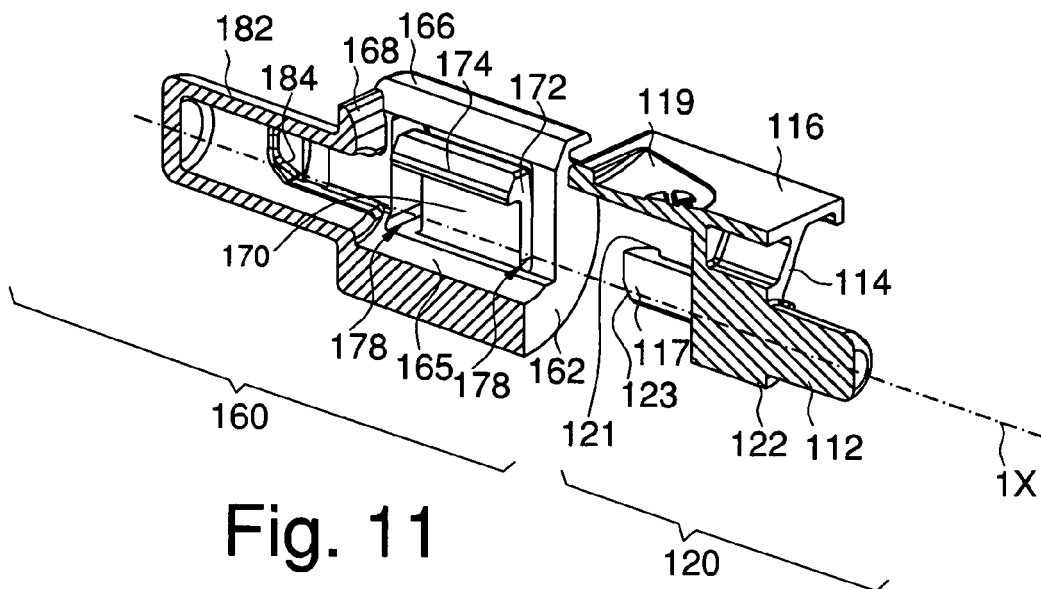
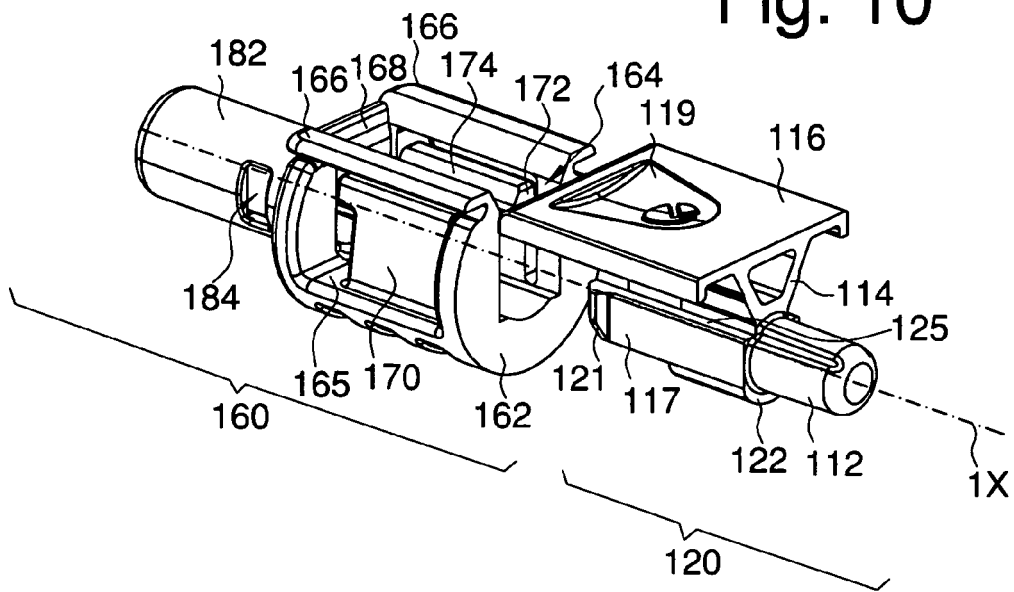


Fig. 11

Fig. 12

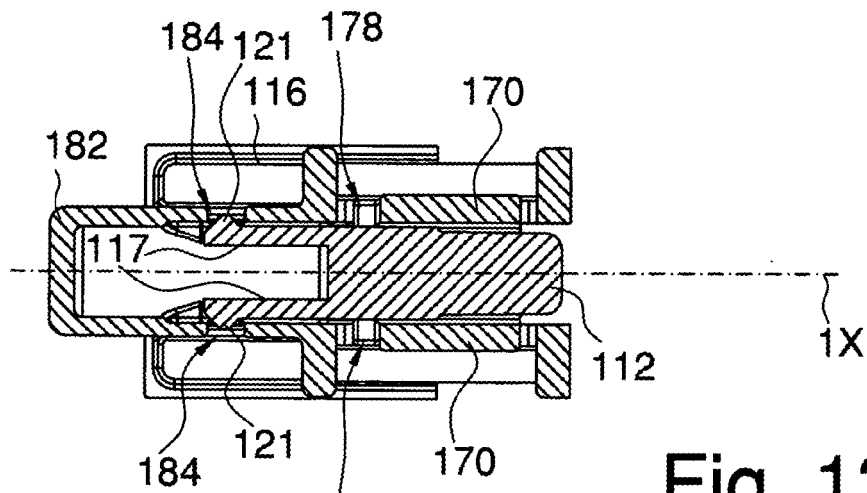
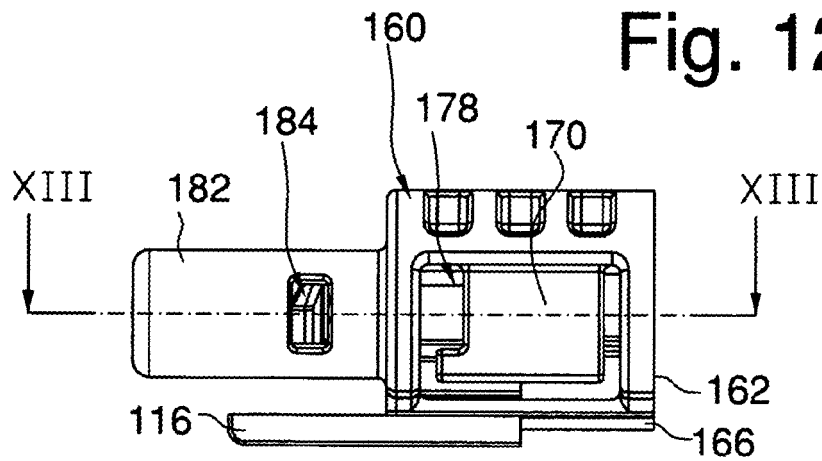


Fig. 13

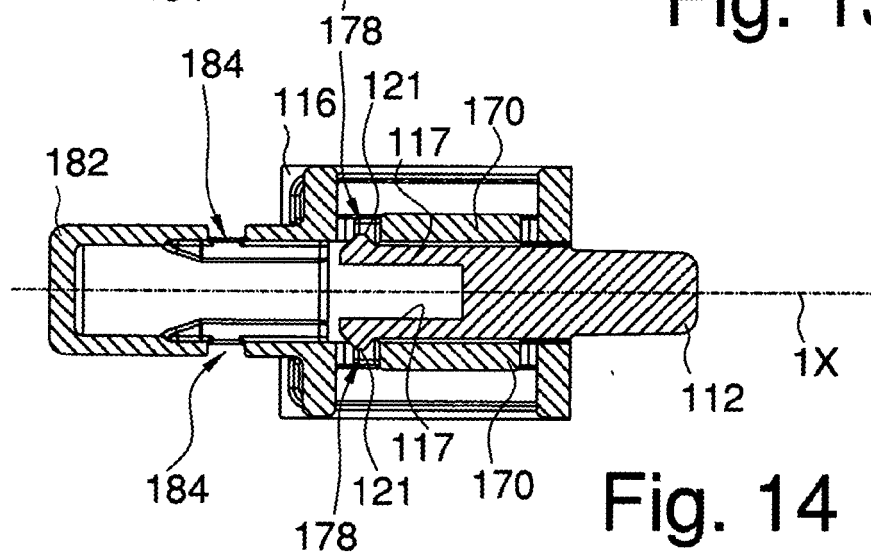


Fig. 14



EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5664

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	US 2004/155163 A1 (MIGLI CARLO [IT]) 12 August 2004 (2004-08-12) * paragraphs [0030] - [0045]; figures 5,6 *	1-5,15	INV. A47B96/06
A	US 2 252 570 A (KNUTH HARVEY G) 12 August 1941 (1941-08-12) * the whole document * -----	1	
			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 19 February 2009	Examiner Lassen, Steen D.
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			

1
EPO FORM 1503 03.82 (P04C01)

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

EP 08 42 5664

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.

19-02-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004155163 A1	12-08-2004	CN 1526344 A	08-09-2004
		EP 1454565 A1	08-09-2004

US 2252570 A	12-08-1941	NONE	

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

- EP 1228721 A [0003]