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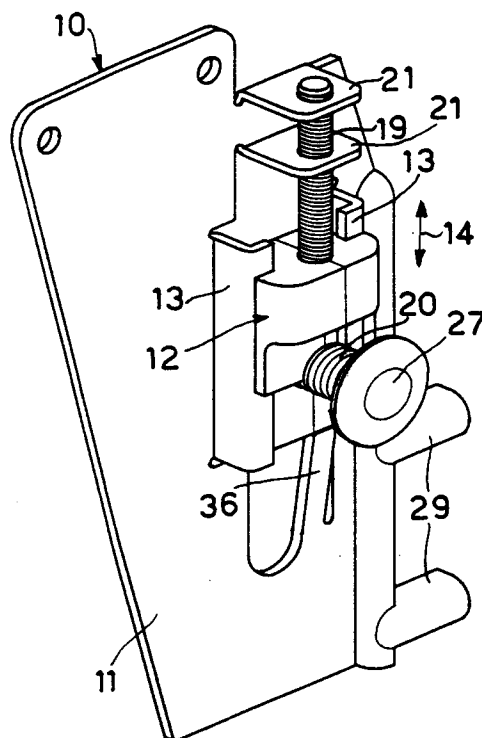
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I-20099 Sesto San Giovanni (Milano) (IT)(54) **Improved concealed device for wall-mounting an item of wall furniture.**

(57) A concealed device for wall-mounting of an item of wall furniture comprises a fastening element (26) adjustable in depth and height and which is carried by a plate (11) having a plurality of fixing pins (29) extending at one side of the plate in a single piece therewith, and a plurality of bores (30) for fastening screws on the opposite side of the plate (11).

Fig.1**EP 0 555 924 A1**

This invention relates to improvements to concealed devices for wall-mounting an item of wall furniture, preferably but not necessarily a kitchen cabinet.

To wall-mount an item of wall furniture it is known to the expert of the art to use concealed devices in which a coupling element is articulatedly secured to a frame or plate in such a manner as to be adjustable in position relative to said plate.

The plate is fixed to the side and possibly also to the top panel of the furniture item rearward of the back panel, the coupling element being freely engaged with a bar or hook plugs fixed into the wall, or with some other object suitable for the purpose.

The aforesaid mounting devices are also provided with linkages comprising adjustment screws by which the vertical position of the coupling element relative to the plate, or its length, can be adjusted as can the angle formed between the plate and coupling element by virtue of the degree of opening of this latter.

Said adjustment screws are accessible from the interior of the furniture item through one or more apertures provided in the back panel.

By this means the position of the item of wall furniture can be adjusted within certain limits in terms of its depth and height after it has been mounted on the wall by engaging the coupling elements of the devices fixed to the sides of the furniture item with the bar or hooks fixed to the wall.

Mounting devices of the aforesaid briefly described type are described and illustrated for example in German patents 2,717,167, 3,036,984 and 3,111,357, in EP-A-389,054 and in US-A-4,143,846.

Although mounting devices of the known art operate satisfactorily, they have the drawbacks of a complex bulky structure, and complicated assembly.

This means that mounting devices of known type are of relatively costly manufacture.

In addition, the adjustment linkages for adjusting the position of the item of wall furniture in terms both of depth and height are interconnected. The result is that any one adjustment also affects the other, even if to a minimum extent, and this is undesirable.

The general object of the present invention is to obviate the drawbacks of the known art by providing a device with an extremely simple and light structure, and comprising components which can be assembled rapidly, leading to considerable overall economy.

Again, the mounting devices of the known art comprise plates configured such as to form either a right hand or a left hand device, both of which are required, with all the drawbacks deriving therefrom.

A further object of the present invention is to obviate the drawbacks of the known art by providing a device which in addition to comprising an extremely simple and light structure, with components which can be assembled rapidly, also comprises a universal plate which can be applied to either side of the item of furniture by screws or pins, either onto a top panel which is flush with the side panels of the furniture item or onto a top panel which is inward of these, leading to considerable economy.

The said objects are attained by a device with the characteristics defined in the accompanying claims.

The structural and functional characteristics of the invention and its advantages over the known art will be more apparent from the ensuing description given with reference to the accompanying schematic drawings, which show two embodiments of the concealed device incorporating the innovative principles of the invention.

In the drawings:

Figure 1 is a perspective view showing a first embodiment of the mounting device of the invention;

Figure 2 is a view similar to Figure 1, but showing the device adjustment linkages in a different operating position;

Figure 3 is a perspective view showing only the plate of the mounting device;

Figure 4 is an exploded perspective view showing only the adjustment linkages of the mounting device of the invention;

Figure 5 is an exploded view showing the arrangement of the adjustment linkages of Figure 4 mounted within one half of the slide;

Figure 6 is a perspective view showing the adjustment linkages of Figures 4 and 5 completely mounted within the slide;

Figure 7 is a view similar to Figure 6, but from the opposite side;

Figure 8 is a perspective view of the mounting device of the invention fixed to the rear of an item of wall furniture;

Figure 9 is a perspective view from the inside of the item of wall furniture to which the device of the invention is applied;

Figure 10 is a view similar to Figure 8, but showing the mounting device fixed to an item of wall furniture in which the top panel is flush with the side panels of the furniture item;

Figure 11 is a perspective view showing another possible embodiment of the mounting device according to the invention;

Figure 12 is a view similar to Figure 11, but showing the device adjustment linkages in a different operating position;

Figure 13 is a perspective view showing only the plate of the mounting device;

Figure 14 is a view similar to Figure 13, but showing a rear view of the plate;

Figure 15 is an exploded perspective view showing only the adjustment linkages of the mounting device of the invention;

Figure 16 is an exploded view showing the arrangement of the adjustment linkages of Figure 15 mounted within one half of the slide;

Figure 17 is a perspective view showing the adjustment linkages of Figures 15 and 16 completely mounted within the slide;

Figure 18 is a view similar to Figure 17, but from the opposite side;

Figure 19 is a perspective view showing the rear side of the mounting device according to the invention;

Figure 20 is a perspective view of the mounting device according to the invention fixed to the rear of an item of wall furniture by fixing screws, in which the top panel is flush with the side panels of the furniture item;

Figure 21 is a view similar to Figure 20 but showing the mounting device of the invention in a different operating position (adjustment position), and fixed to the side panel of the furniture item by the pins of the plate, instead of by screws;

Figure 22 is a view similar to Figure 21, but enlarged and showing the fixing of the device to the top panel of the furniture item by inclined screws, and its connection to a bar fixed to the wall;

Figure 23 is a perspective view of the mounting device of the invention fixed to the rear of an item of wall furniture by pins, and in which the top panel is inward of the side panels of the furniture item; and

Figure 24 is a perspective view from the interior of the item of wall furniture to which the device of the invention is applied.

With reference to Figures 1-3 of the drawings, the mounting device according to the invention is indicated overall by 10 and is structurally formed by combining a plate 11, which can assume various configurations, with a slide 12 which is mounted on opposing parallel guides 13 of the plate 11 in a manner vertically movable in the directions of the arrow 14.

Characteristically (Figures 4-7), the slide 12 is constructed in two halves 15 (Figure 4) connected together by pins 16, 17 and held together by the lateral opposing parallel guides 13, which embrace corresponding lateral sections 18 (Figures 6 and 7) of said halves 15.

The pins 16, 17 provide secure interconnection between the two halves 15 during the assembly of

the device (Figure 7), so as to form a stable sub-unit which can be fitted automatically to the plate 11.

The slide 12 contains the device adjustment linkages, consisting of two screws 19, 20.

The first screw 19 extends substantially coaxially from the slide 12 and is screwed through a pair of threaded flanges 21 formed integrally with the plate 11. The screws 19 are operated via a bevel gear pair 22, 23 (Figures 4, 5) housed rotatably in complementary seats in the two halves 15 of the slide 12, the gear 22 being integral with the head of the screw 19, the gear 23 comprising a slot 24 for an operating screwdriver.

In Figure 4 the gear 23 is shown from both sides.

The second screw 20 lies in the same plane as the screw 19, but screws perpendicular to it by passing through a threaded hole 25 formed in the two halves 15 by pressing.

The second screw 20 (shown from both sides in Figure 4) comprises at one end a slot 26 for an operating screwdriver, and at its other end a head 27 which can be coupled in a freely removable manner to an anchoring element fixed to the wall, such as a bar 28 (Figure 8).

In addition as can be clearly seen in Figure 4, the screw 20 comprises a threadless end portion 37 which prevents the screw 20 being completely unscrewed from the threaded hole 25.

The device is completed by two fixing pins 29 (Figures 1-3) extending laterally from and integral with the plate 11.

The operation of the device according to the invention is apparent from the foregoing description with reference to Figures 1-10, and briefly is as follows.

The device assembled as shown in Figures 1, 2 is fixed to the side panel 30 of an item of wall furniture by inserting the pins 29 of the plate 11 therein, and is also preferably fixed by screws 31 to the top panel 32 thereof, on the rear side of the back panel 33 (Figures 8, 9, 10).

The item of wall furniture must be provided with at least two of said devices (right and left), one on each side, so as to be able to be mounted on the wall by engaging the head 27 with the profiled bar 28 fixed to the wall (not shown), or with another equivalent element.

When the furniture item has been mounted in this manner, its position can be comfortably adjusted relative to the wall by operating the screw 20 for depth adjustment and operating the gear 23 for height adjustment.

Specifically, by rotating the screw 20 in one direction or the other the furniture item can be shifted further from or closer to the wall by the traction exerted by the head 27.

By rotating the gear 23 the height of the furniture item can be adjusted by the relative sliding between the plate 11 and slide 12 due to the rotation of the screw 20.

A tongue 36 formed integrally with the plate 11 (Figures 1-3) prevents the slide 12 escaping from the guides 13.

The facility for and extent of adjustment of the device of the invention are apparent from Figures 1 and 2 of the drawings.

Access to the screw 20 and gear 23 is available via an aperture 34 (Figure 9) provided in the back panel 33, which aperture can be concealed for reasons of appearance by a cover 35.

Figure 10 shows the mounting device of the invention fixed to an item of wall furniture in which the top panel 32 instead of being inward of the edge of the side panel 30 as shown in Figures 8 and 9 is flush with the side panel 30. In this case the plate 11 comprises a flange 38 screwed to the top panel 32.

With reference to Figures 11-14 of the drawings, a further embodiment of the mounting device according to the invention is indicated overall by 110 and is structurally formed by combining a plate 111 with a slide 112 which is mounted on opposing parallel guides 113 of the plate 111 in a manner vertically movable in the directions of the arrow 114.

Characteristically (Figures 15-18), the slide 112 is constructed in two halves 115 (Figure 15) connected together by pins 116, 117 and held together by the lateral opposing parallel guides 113, which embrace corresponding lateral sections 118 (Figures 17 and 18) of said halves 115.

The pins 116, 117 provide secure interconnection between the two halves 115 during the assembly of the device (Figures 17 and 18), so as to form a sub-unit which can be fitted automatically to the plate 111.

The slide 112 contains the device adjustment linkages, consisting of two screws 119, 120.

Figure 15 of the drawings shows said two screws, 119, 120 in two positions mutually rotated through 180°.

The first screw 119 passes obliquely through the slide 112 and is screwed into a first threaded hole 121 formed in the two halves 115 by pressing.

The screw 119 is operated by a cross slot 122 for an operating screwdriver, the slot 122 being provided in one end of the screw (Figure 15). That end of the screw 119 distant from the slot 122 comprises an unthreaded portion 123 to prevent the escape of the screw 119 from the threaded hole 121. Said end reacts against an abutment 138 formed integrally with the plate 111.

The second screw 120 lies in the same plane as the screw 119, but screws perpendicular to the

slide 112 by passing through a second threaded hole 124 formed in the two halves 115 by pressing.

The second screw 120 comprises at one end a slot 125 for an operating screwdriver, and at its other end a head 126 which can be coupled in a freely removable manner to an anchoring element fixed to the wall, such as a bar 127 (Figures 22 and 23).

In addition as can be clearly seen in Figures 15 and 16, the screw 120 comprises a threadless end portion 128 which prevents the screw 120 being completely unscrewed from the threaded hole 124, in which the screw 120 (as does the screw 119) remains confined on connecting together the two halves 115.

Characteristically, the device is completed by a series of fixing pins 129 (Figures 11-13) extending laterally from and integral with one side of the plate 111, and by a series of oblique holes 130 for fixing screws provided in the opposite "boxed" side 131 of the plate 111. In addition from and integral with the upper side of the plate 111 there extends a flange 132 with holes 133 for fixing the plate 111 to the top panel 135 of the furniture item by screws 134 (Figure 22).

The operation of the device according to the invention is apparent from the foregoing description with reference to Figures 11-24, and briefly is as follows.

The device assembled as shown in Figures 11, 12 is fixed to the side panel 136 of an item of wall furniture either by screws, not shown (Figure 20), or by inserting the pins 129 of the plate 111 therein (Figure 21), and is also preferably fixed by screws 134 to the top panel 135 thereof, on the rear side of the back panel 137 (Figures 20, 21, 22).

The item of wall furniture must be provided with at least two of said devices (right and left), one on each side, so as to be able to be mounted on the wall by engaging the head 126 with the profiled bar 127 fixed to the wall (not shown), or with another equivalent element.

When the furniture item has been mounted in this manner, its position can be comfortably adjusted relative to the wall by operating the screw 120 for depth adjustment and operating the screw 119 for height adjustment.

Specifically, by rotating the screw 120 in one direction or the other the furniture item can be shifted further from or closer to the wall by the traction exerted by the head 126.

The height of the furniture item can be adjusted by the relative sliding between the plate 111 and slide 112 by rotating the screw 119, one end of which acts against the abutment 138 on the plate 111.

A tongue 139 formed integrally with the plate 111 (Figures 11 and 12) prevents the slide 112

escaping from the guides 113.

The facility for and extent of adjustment of the device of the invention are apparent from Figures 11 and 12 of the drawings.

Access to the screws 119 and 120 is available via an aperture 140 (Figure 24) provided in the back panel 132, which aperture can be concealed for reasons of appearance by a cover 141.

Figures 23 and 24 show the mounting device of the invention fixed to an item of wall furniture in which the top panel 135 instead of being flush with the edge of the side panel 136 as shown in Figure 22 is inward of the side panel 136. In this case the plate 111 comprises holes 142 (Figure 19) for fixing screws 143 which pass through the back panel 137 and into the top panel 135.

The device of the invention is of simple and economical manufacture, it being composed of a minimum number of pieces easily assembled onto the plate, with particular reference to the slide, which is mounted on the plate freely without the use of any screw or similar engagement.

The provision of the inclined screw 119 means that the slide 112 can move to a greater extent than the stroke of travel of the screw. Hence adequate adjustment of the plate 111 in terms of height can be achieved within a small space.

The particular structure of the plate 111, which is provided with pins 129 on one side and holes 130 for fixing screws on the opposite side, means that the same pair of devices (one right and one left) of Figures 20 and 21 can be used independently of the chosen fixing system (either pins or fixing screws).

The screw 119, being inclined, can be operated easily from the interior of the furniture item by a screwdriver inclined in the same manner as the screw.

The further object defined in the introduction to the description is hence attained.

Claims

1. A concealed device for wall-mounting an item of wall furniture comprising, in combination: a plate 11 to be fixed to the furniture item, a coupling element (27) secured to said plate (11) and arranged to engage a support member (28) fixed to the wall, a first screw (19) operable by a bevel gear pair (22, 23) acting between said plate (11) and said coupling element (27) to adjust the vertical position of this latter relative to the plate (11), and a second screw (20) carrying at one end said coupling element (27) and at its opposite end a slot (26) for a screwdriver to adjust the distance between the coupling element (27) and the plate (11), characterised in that said screw (19) and

said screw (20) lie in the same plane and extend perpendicular to each other from a slide (12) movable along guides (13) provided on and parallel to the plate (11), the screw (19) screwing through a threaded hole (21) in the plate (11) and the screw (20) screwing through a through hole (25) in the slide (12).

2. A device as claimed in claim 1, characterised in that said slide (12) comprises two halves (15) which partially embrace said screws (19, 20) and in which there are provided the seats for said bevel gear pair (22, 23) and a thread (25) for said screw (20).
3. A device as claimed in claim 2, characterised in that said two halves (15) are held together by the guides (13) provided on the plate (11).
4. A device as claimed in claim 1, characterised in that said second screw (20) comprises a threadless end portion 37.
5. A device as claimed in claim 1, characterised in that a stop tongue (36) for the slide (12) is formed within said plate 11.
6. A concealed device for wall-mounting an item of wall furniture comprising, in combination: a plate (111) to be fixed to the furniture item, a coupling element (126) secured to said plate (111) and arranged to engage a support member (127) fixed to the wall, a first screw (119) acting between said plate (111) and said coupling element (126) to adjust the vertical position of this latter relative to the plate (111), and a second screw (120) carrying at one end said coupling element (126) in order to adjust the distance between the coupling element (126) and the plate (111), characterised in that said plate (111) comprises a series of fixing pins (129) integral with and extending from one side thereof, and a series of fixing screw holes (130) provided in the opposite side of the plate (111).
7. A device as claimed in claim 6, characterised in that said series of holes (130) is provided in a "box-type" side (131) of the plate (111).
8. A device as claimed in claim 6, characterised in that from the upper side of the plate (111) there extends integral therewith a flange (132) comprising a first series of holes (133) for fixing the plate (111) to the top panel (135) of the furniture item by screws (134), and a second series of holes (142) for fixing the plate (111) to the top panel (135) through the back

panel (137).

9. A device as claimed in claim 6, characterised in that said screw (119) and said screw (120) lie in the same plane and extend respectively obliquely to and perpendicularly to a slide (112) which is movable along guides (113) provided on and parallel to the plate (111), said screws (119, 120) screwing through respective threaded holes (121, 124) in said slide (112), one end of said screw (119) reacting against an abutment (138) on the plate (111). 5 10
10. A device as claimed in claim 9, characterised in that said slide (112) comprises two halves (115) which partially embrace said screws (119, 120), said threaded holes (121, 124) being formed in said halves (115) by pressing. 15
11. A device as claimed in claim 10, characterised in that said two halves (115) are held together by a series of pins (116, 117) and by the guides (113) provided on the plate (111). 20
12. A device as claimed in claim 6, characterised in that said screws (119, 120) comprise respective threadless end portions (123, 128). 25
13. A device as claimed in claim 6, characterised in that a stop tongue (139) for the slide (112) is formed within said plate (111). 30

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Fig.1

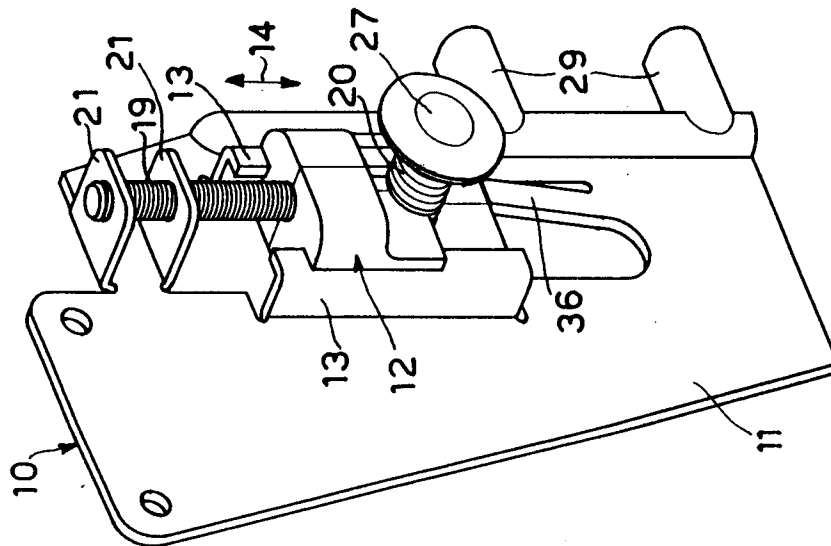


Fig.2

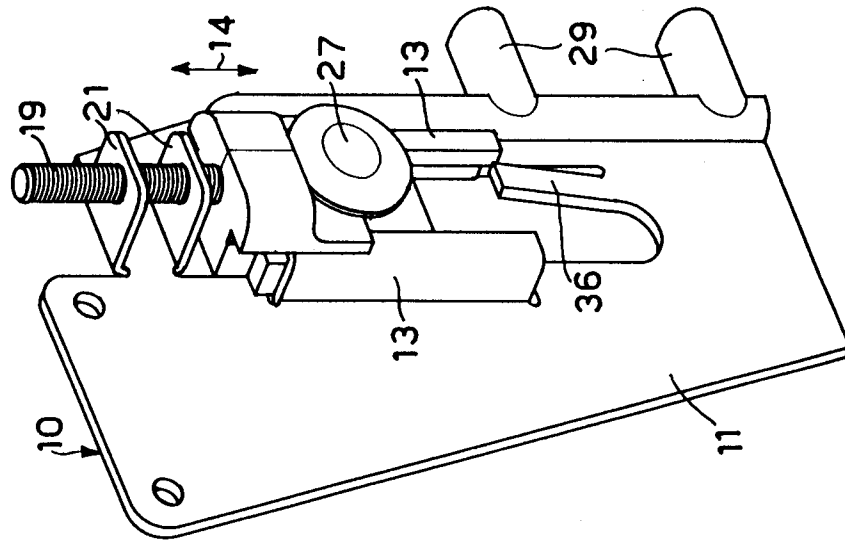
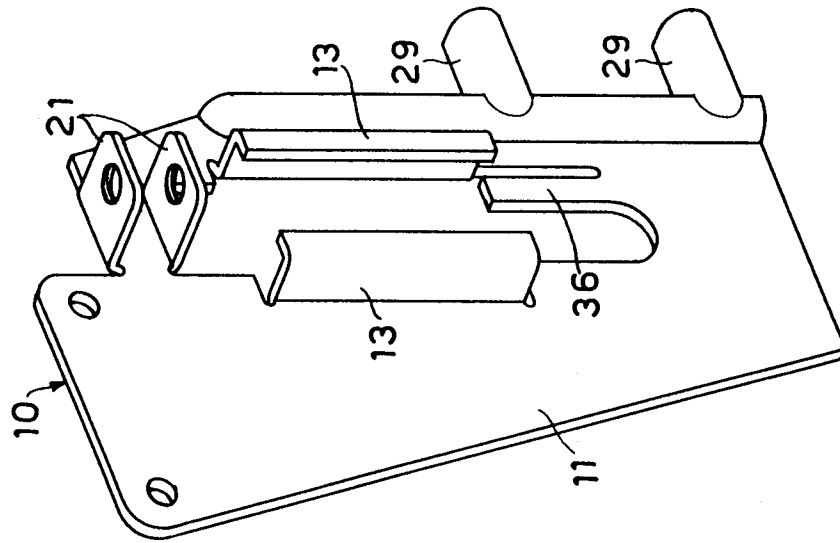


Fig.3



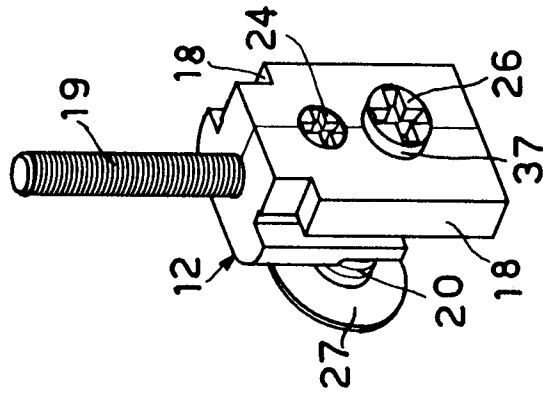
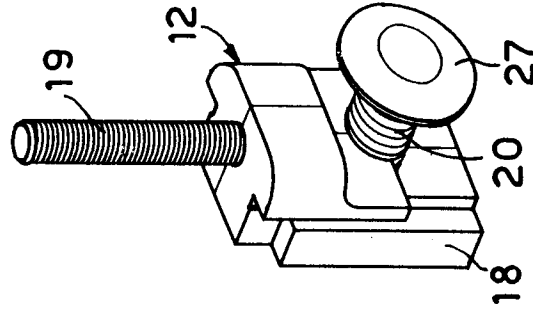
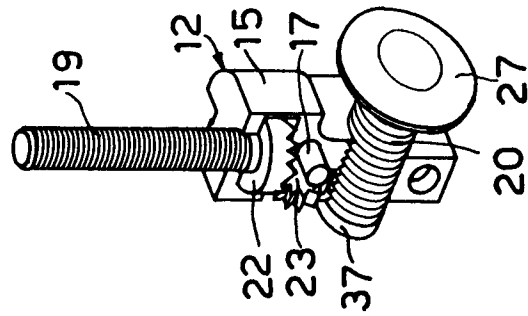
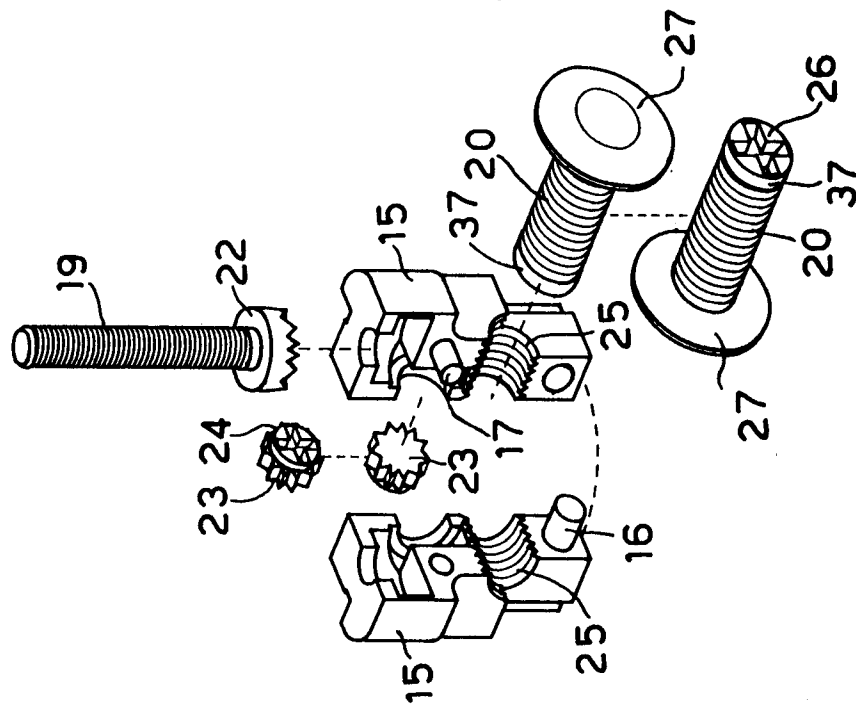


Fig. 8

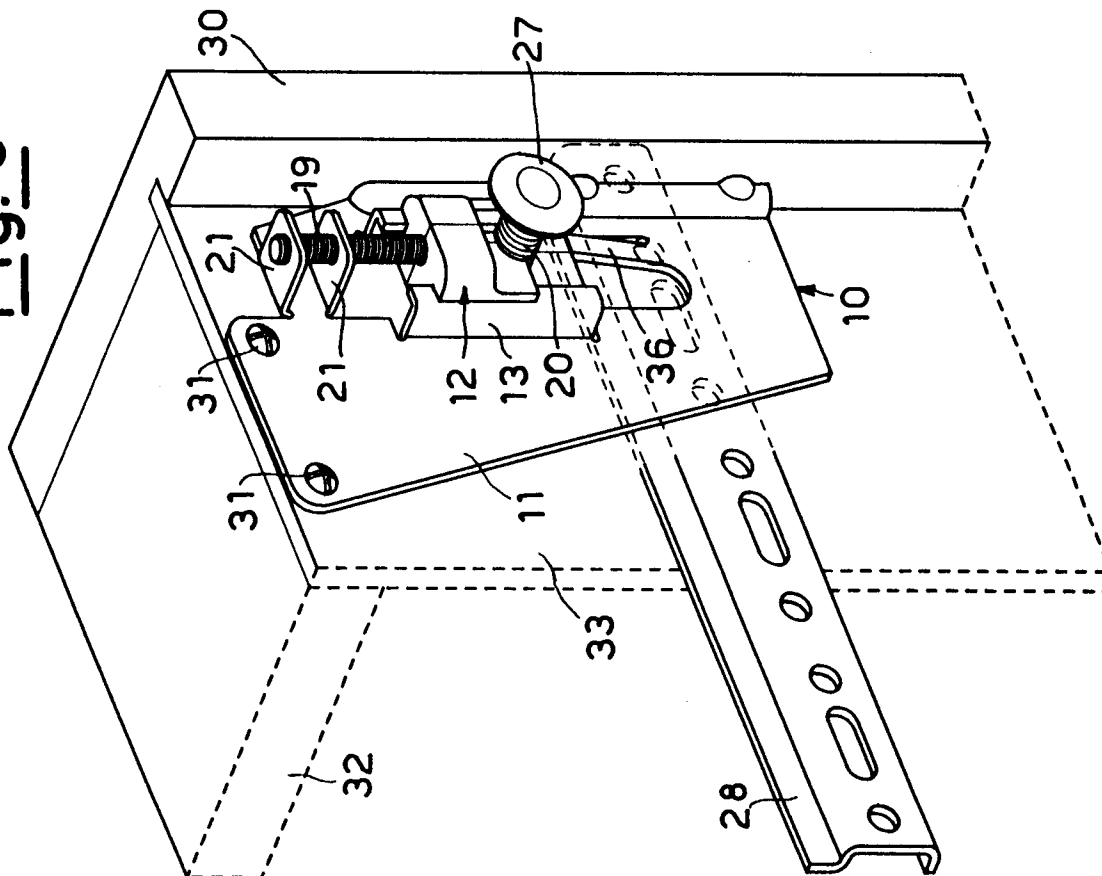


Fig. 9

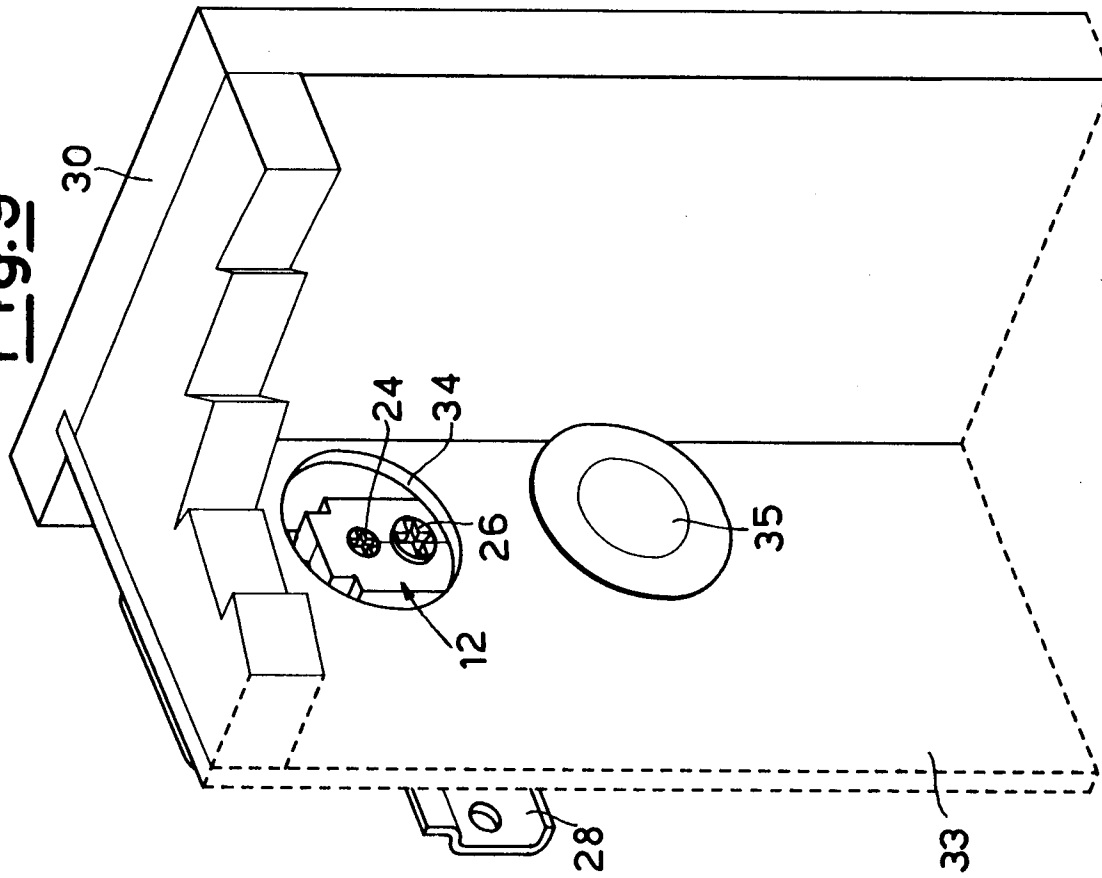


Fig.10

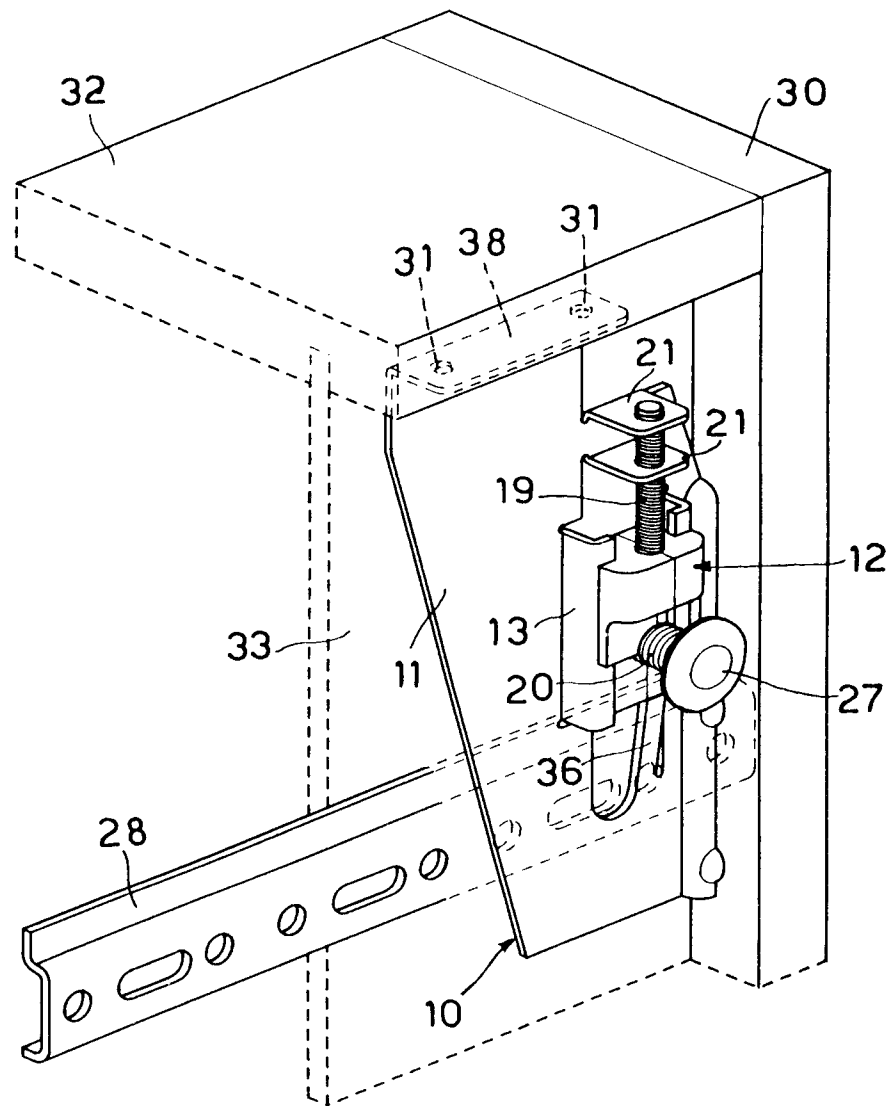


Fig.11

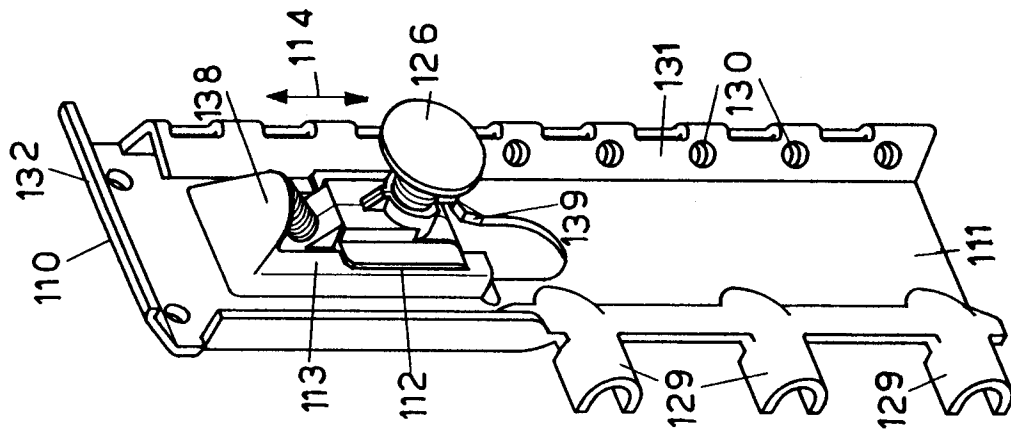


Fig.12

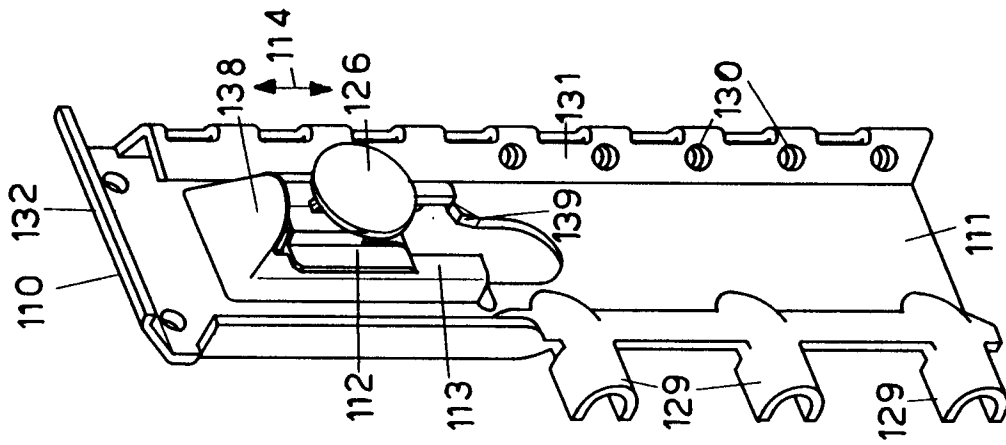


Fig.13

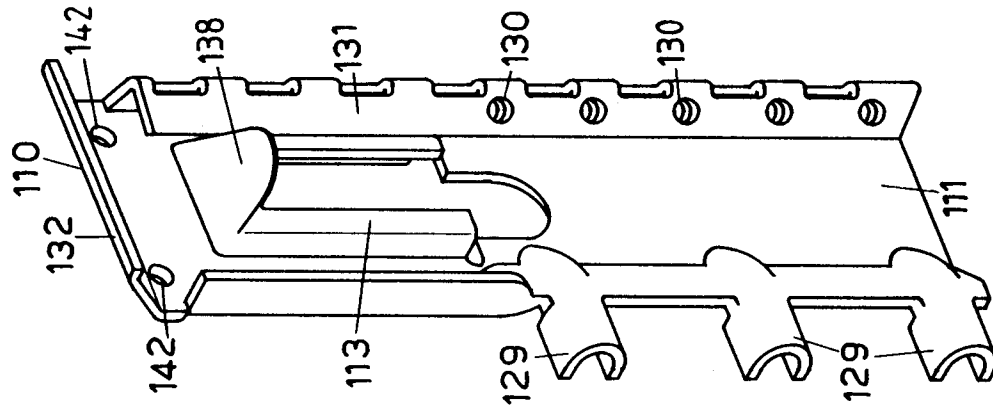
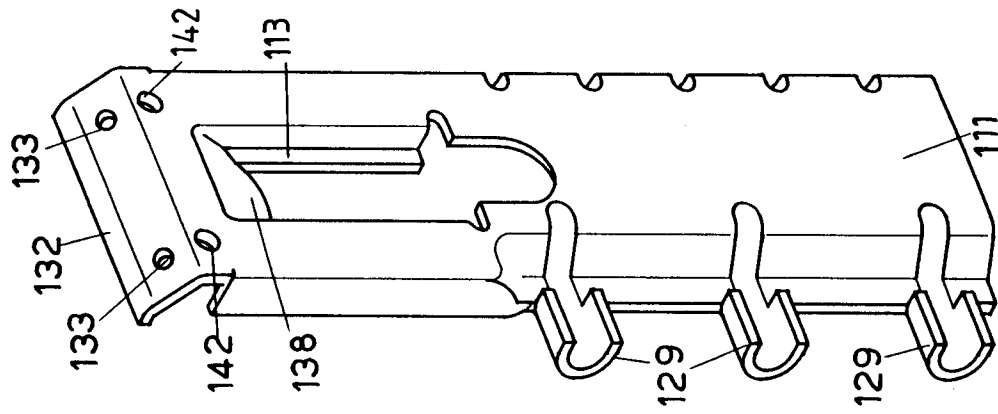


Fig.14



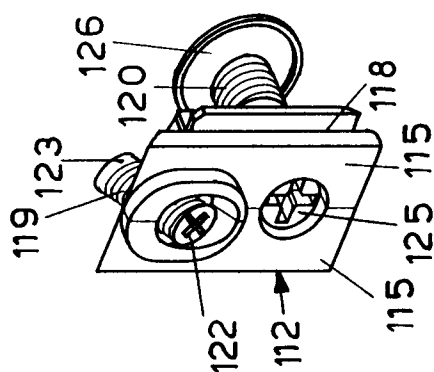
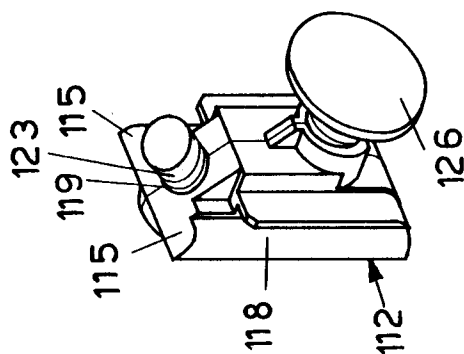
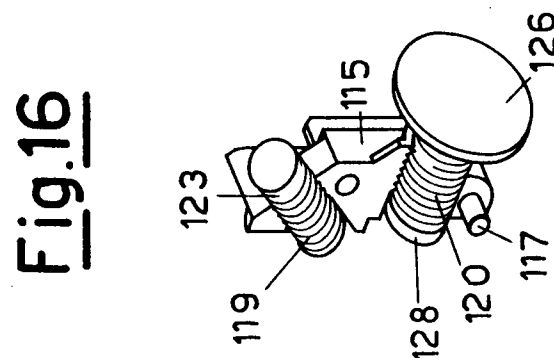
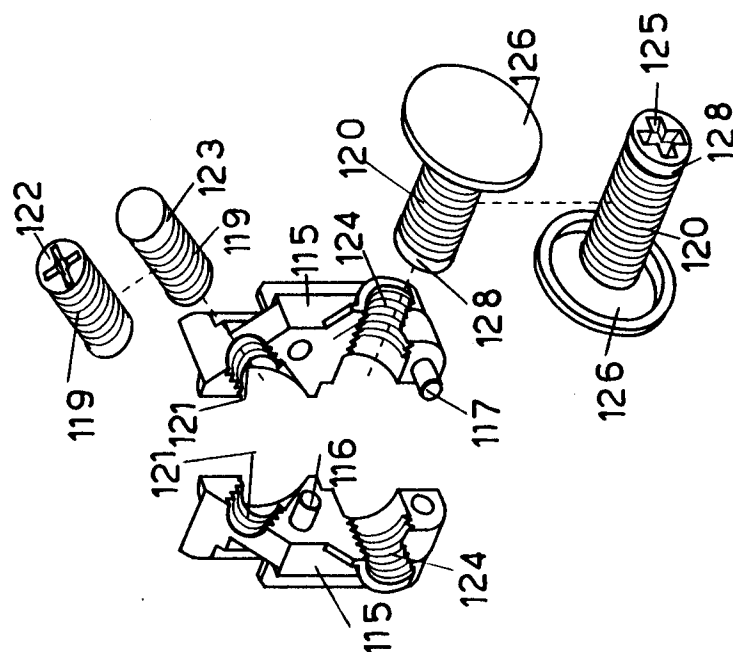
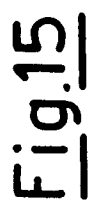


Fig.19

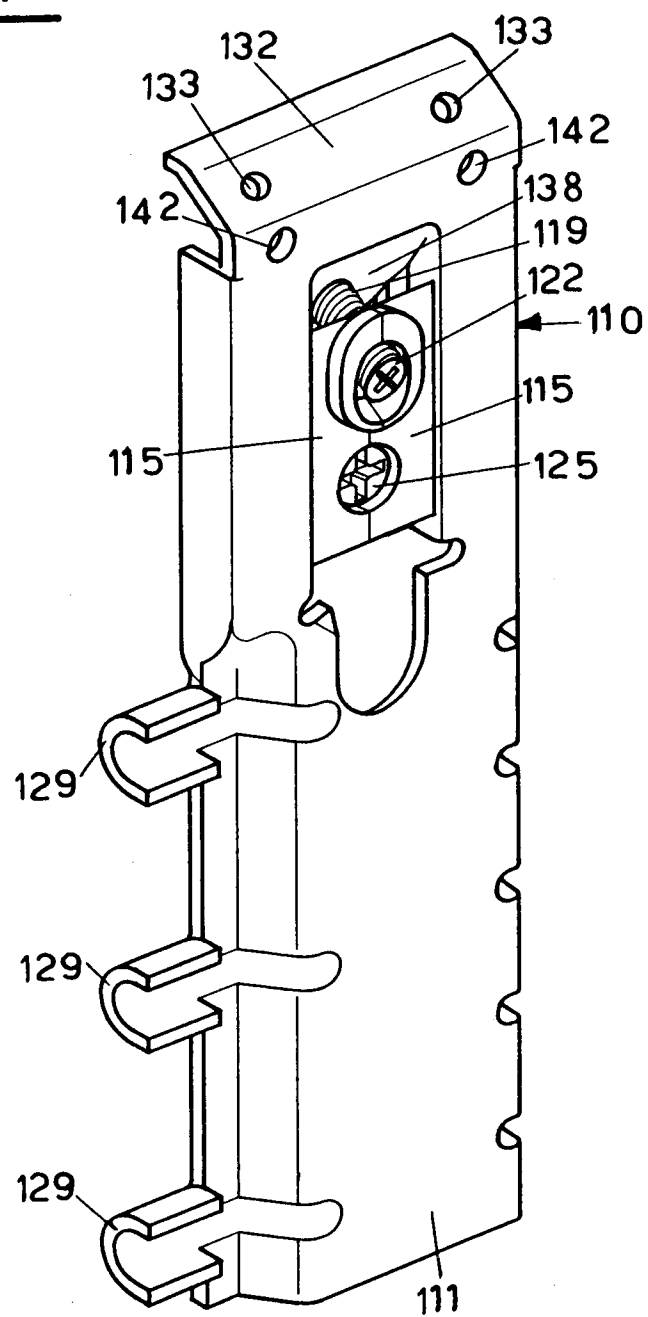


Fig.20

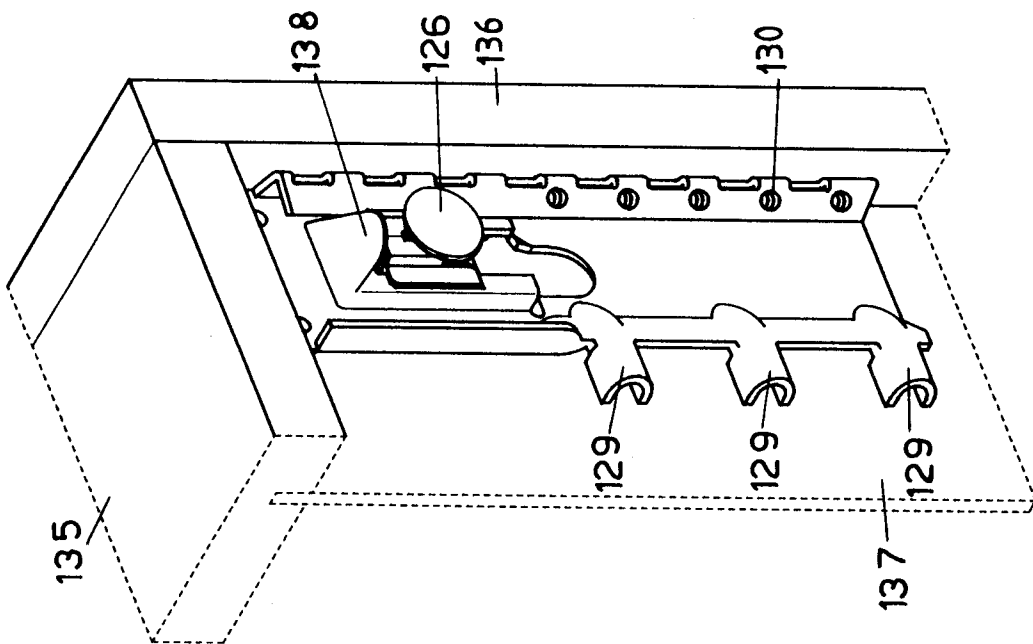


Fig.21

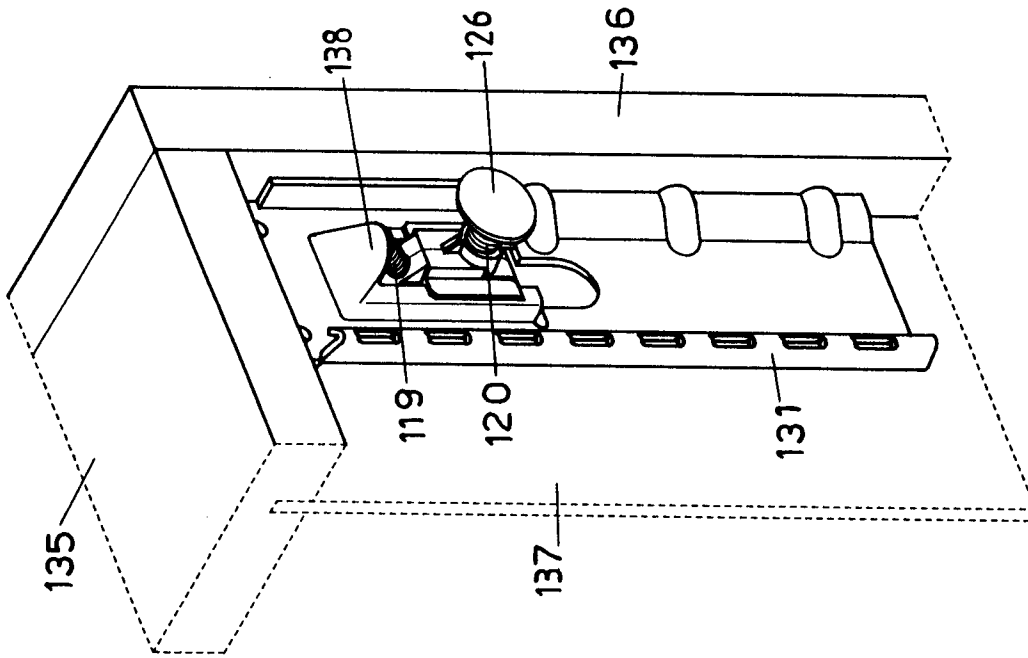


Fig.22

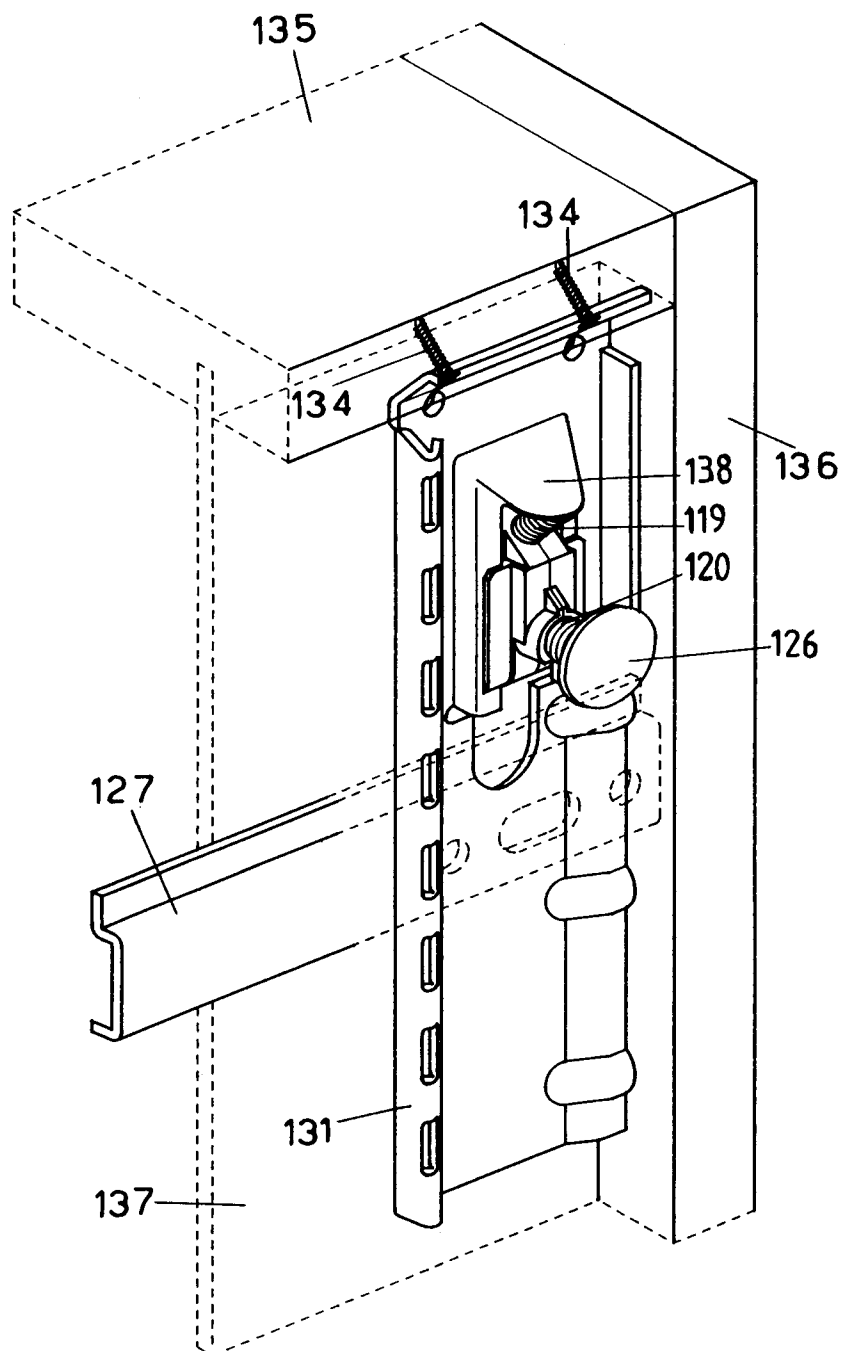


Fig.23

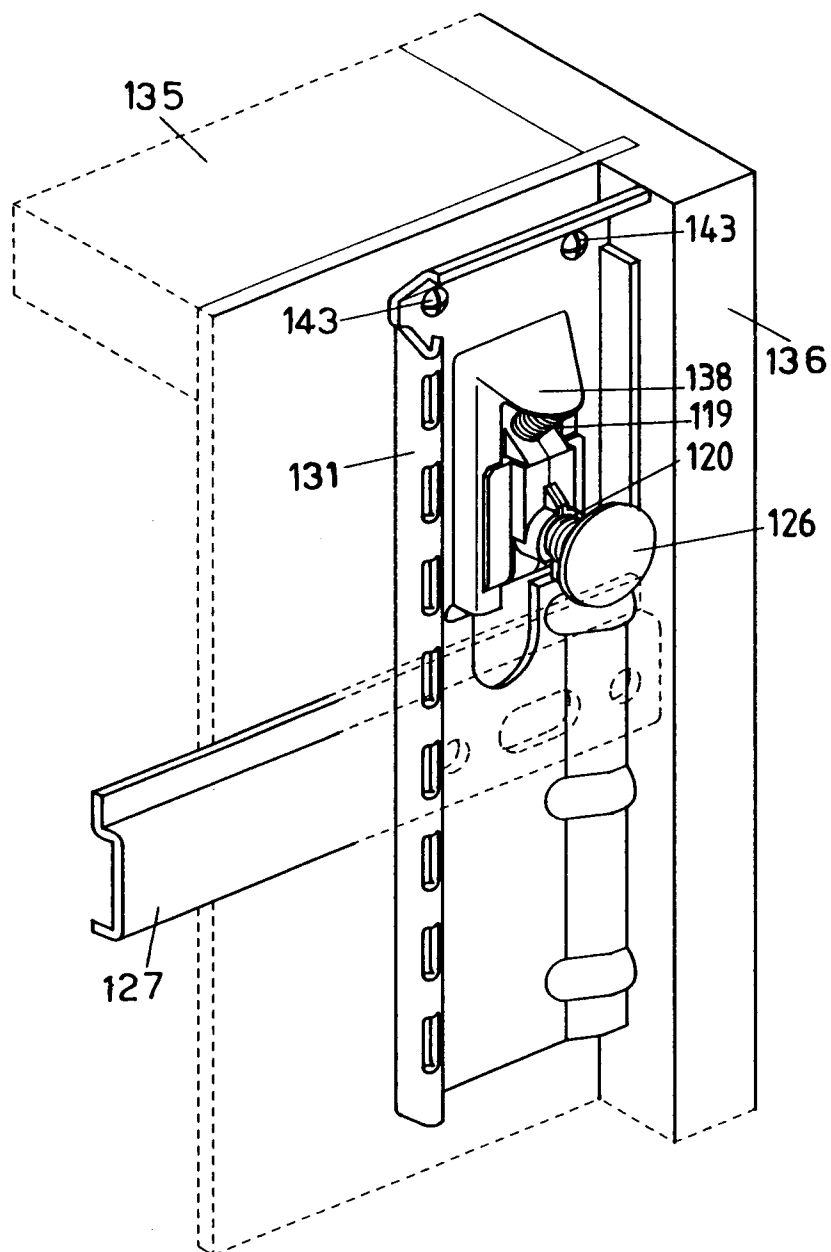
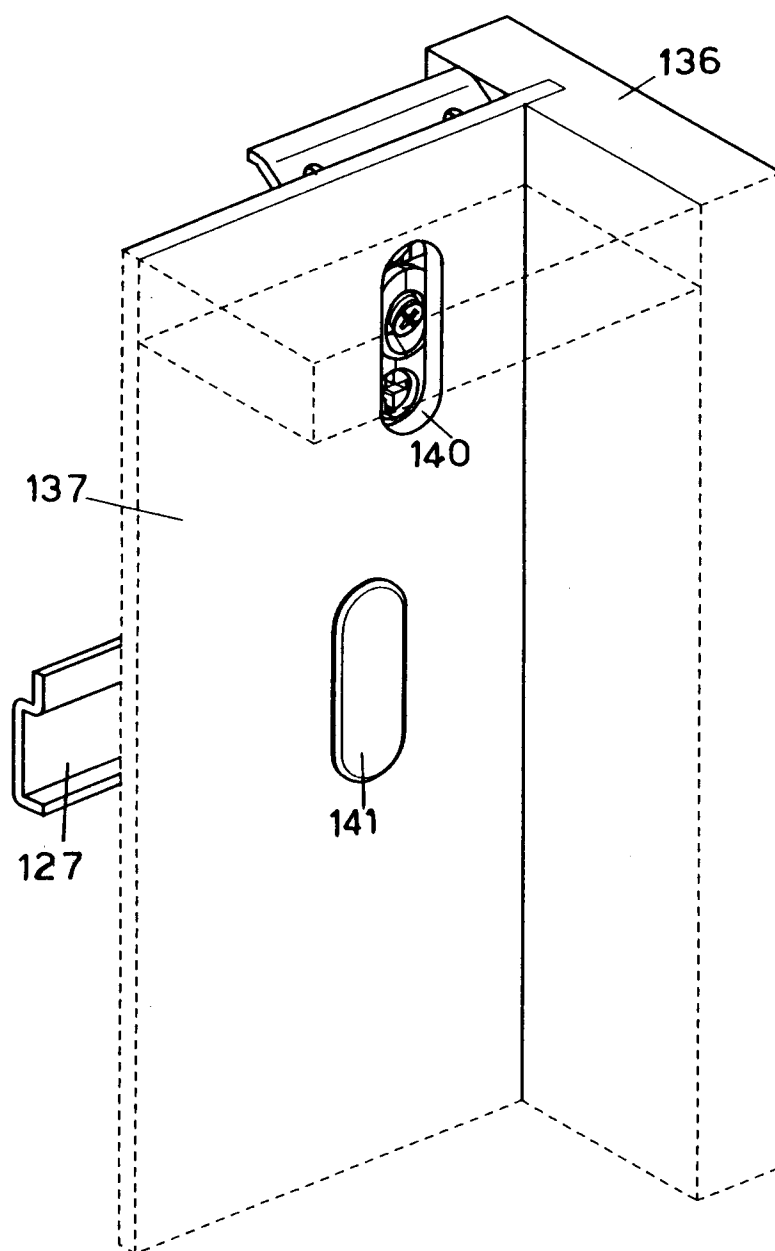


Fig.24





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 20 0341

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 418 769 (MIELE & CIE GMBH & CO) * the whole document * -----	1,6	A47B95/00
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A47B
The present search report has been drawn up for all claims			
Place of search THE HAGUE	Date of completion of the search 25 MAY 1993	Examiner NOESEN R.F.	
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			