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(54) **Support for furniture**

(57) Lower levelling support element for overhanging wall-mounted furniture anchored to the wall that includes an adjustable support foot (2) with a support surface (3) for the structural side panels (21) and/or base panels (22) of the furniture (18), there being beneath said support surface (3) an adjustment zone (4) with the vertical-adjustment screw head (11) and the depth-adjustment screw head (8a) directly accessible from beneath the furniture (18).

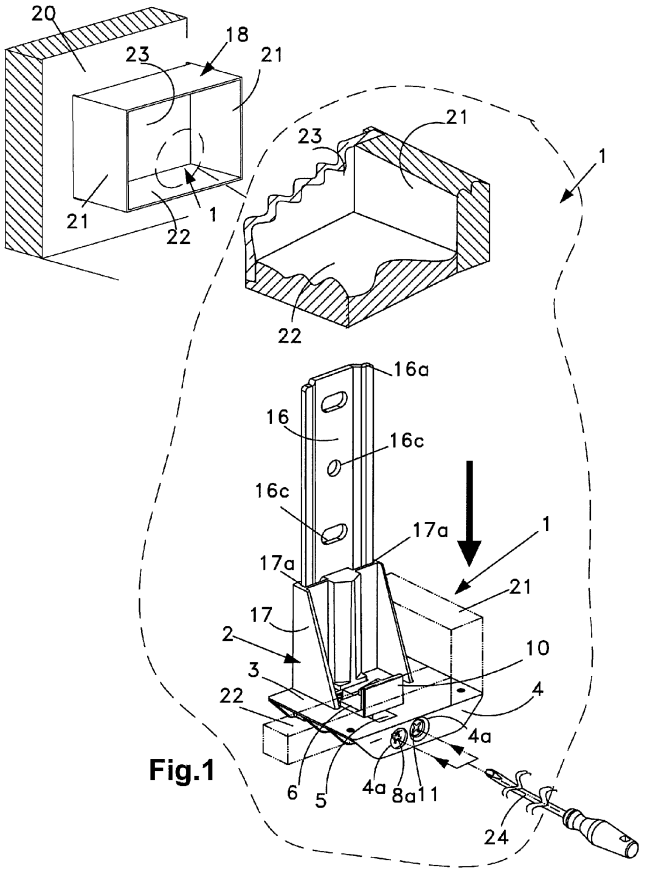

Fig.1

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Description

SCOPE OF THE INVENTION

[0001] The present invention relates to a lower levelling support element for overhanging wall-mounted furniture that is intended to complement the upper support element of the furniture and to counteract the tipping moment of the furniture. The invention also enables access beneath the furniture for the purpose of adjustment.

PRIOR ART

[0002] In this field, lower feet located at the base of the furniture that support said furniture in conjunction with the upper support element to offset the tipping moment of the furniture are known.

[0003] Numerous support elements are known that are relatively complex, in relation to the subject matter of the present invention, in that a large number of elements are used to form the device itself, the construction of which requires complicated production processes. For this type of device, the back of the furniture needs to be machined, as there is no other way to access the support element. Furthermore, the complexity of the support element means that the parts are not symmetrical and therefore a special part has to be created for each side, the right-hand side and the left-hand side. This has a negative impact on production costs and subsequent assembly by specialized labour.

[0004] Moreover, for longer furniture, this system provides no guarantees against bowing, as the aforementioned device can only be installed at the sides of the furniture, and it is impossible to install it halfway along the length of the furniture in order to prevent bowing. This limits the length of the furniture that can be worked with.

DESCRIPTION OF THE INVENTION AND ADVANTAGES

[0005] In consideration of the prior art, the subject matter of this invention is a lower levelling support element for overhanging wall-mounted furniture anchored to the wall with, made up of metal-injection-moulded parts having outstanding elasticity, mechanical strength, hardness and machinability properties, which, for each side of the furniture, include an anchoring plate and an adjustable support foot with a support surface for the structural side panels and/or base panels of the furniture, there being beneath said support surface an adjustment zone with the vertical-adjustment screw head and the depth-adjustment screw head, which are directly accessible beneath the furniture.

[0006] The vertical-adjustment screw head has a vertical-adjustment shaft, the end of which is fitted with a ring gear that meshes with the pinion gear of a threaded rod and the opposite end of which has a stop for the threaded rod joined to the anchoring plate through the stop window, said threaded rod being provided with a coupling nut to the anchoring plate, in the movement of the slider with the slider guide thereof in the plate guide, the guide of the slider fitting the guide of the anchoring plate.

[0007] The stop ensures that the pinion gear of the threaded rod does not bear all of the force and the tipping moment.

[0008] The coupling nut is coupled to the anchoring plate through windows in said anchoring plate, the height of the sides of the window being the same as the coupling nut.

[0009] The depth-adjustment screw of the depth-adjustment screw head is attached to the projection of the guider of the horizontal portion of the adjustable support foot that is guided on the guider channel of the adjustable support foot, said guider having a wall that can butt against the base panel of the furniture.

[0010] The support surface of the adjustable support foot is U-shaped, which facilitates reception of the side panel and/or base panel of any of the sides of the furniture.

[0011] Vertical adjustment helps to position the furniture horizontally when installed overhanging on a wall. To achieve this using a rotary actuating tool, access is provided to the shaft fitted with the ring gear that meshes with the pinion gear of the threaded rod that is located vertically, all of which without interfering at any time with the furniture.

[0012] The diameter of the horizontal-adjustment screw matches the thread of the guider projection, the width of said guider projection fitting the guider channel of the adjustable support foot.

[0013] Another noteworthy feature of the invention is that the lower levelling support element is symmetrical, i.e. it is neither left- nor right-sided, which helps to significantly reduce both manufacturing and assembly costs.

[0014] Furthermore, there is a risk of bowing when installing longer furniture. In this case, the lower levelling support element proposed can be installed halfway between the side panels of the furniture, thereby avoiding the aforementioned problem, as the furniture need not be machined in any way to install the lower levelling support element.

[0015] The support surface of the adjustable support foot of the lower levelling support element is U-shaped, which helps to hold any of the side panels and/or base panels of the furniture.

[0016] Moreover, it is noteworthy that the inside of the furniture need not be machined in an y way for installation on the lower levelling support element, as the furniture is supported on it and the vertical adjustment and the depth adjustment can both be accessed from underneath the furniture, for which the vertical-adjustment and depth-adjustment screw heads are provided with a frontal configuration for the tip of a rotary actuating tool.

[0017] All of the foregoing provides the following advantages: injection-moulded production, which is cheap

for mass production and the automation of which is common and uses conventional means, and easy automation of assembly of the unit itself.

[0018] These and other details of the invention are explained in the detailed description below, which is based on the attached figures.

DRAWINGS AND REFERENCES

[0019] For a better understanding of the nature of the invention, the attached drawings show an industrial embodiment purely by way of an illustrative and nonlimiting example.

Figure 1 is a perspective view of an overhanging piece of furniture (18) with a close-up view of the zone indicated, excluding the rear panel (23) of the furniture (18) and showing the lower levelling support element (1) of the invention, in which the final assembly position of the side panel (21) and base panel (22) of the overhanging furniture (18) is shown, including access to the lower levelling support element (1) from beneath the furniture (18).

Figure 2 is a perspective view of the overhanging furniture (18) in which the lower levelling support element (1) is installed.

Figure 3 is a side view of the overhanging furniture (18).

Figure 4 is an exploded perspective view of the lower levelling support element (1) showing the operational assembly positions.

Figure 4a is a rear view of the adjustable support foot (2) in which the assembly arrow (26) is used to indicate the corresponding position of the stop (25) for the threaded rod (14).

Figure 5 is a front view of the lower levelling support element (1).

Figure 6 is a cross section, along B-B indicated in Figure 5, showing depth adjustment, for which only the base panel (22) is shown.

Figure 7 is a cross section, along A-A indicated in Figure 5, showing vertical adjustment, for which only the side panel (21) is shown.

Figure 7a is a close-up of the detail indicated in Figure 7, showing the operational position of the stop (25) in relation to the anchoring plate (16) and the threaded rod (14).

[0020] The following references are used in these figures:

1. Lower levelling support element
2. Adjustable support foot of lower levelling support element (1)
3. Support surface of adjustable support foot (2)
4. Adjustment zone of the adjustable support foot (2)
4a. Hole in plane (4)
5. Guider channel of the adjustable support foot (2)
6. Guider of the adjustable support foot (2)
7. Guider projection (6) of the adjustable support foot (2)
8. Depth-adjustment screw
8a. Head of depth-adjustment screw (8)
9. Thread of projection (7)
10. Front wall of the guider (6)
11. Head of the vertical-adjustment screw (12)
12. Vertical-adjustment shaft
13. Ring gear of vertical-adjustment shaft (12)
14. Threaded rod
14a. Pinion gear of threaded rod (14)
15. Coupling nut of threaded rod (14)
16. Anchoring plate
16a. Guide of anchoring plate (16)
16b. Coupling window of anchoring plate (16)
16c. Anchoring hole of anchoring plate (16)
16d. Stop window
17. Slider of adjustable support foot (2)
17a. Guide of slider (17)
18. Furniture
19. Upper hanging device for furniture (18)
20. Wall
21. Side panel of furniture (18)
22. Base panel of furniture (18)
23. Rear panel of furniture (18)
24. Rotary tool
25. Stop for threaded rod (14)
26. Assembly arrow for stop (25)

PREFERRED EMBODIMENT

[0021] With reference to the drawings and references mentioned above, the attached views show a preferred embodiment of the subject matter of the invention, which relates to a lower levelling support element (1) for overhanging, wall-mounted furniture (18) that is anchored to the wall (20), which includes an anchoring plate (16) and an adjustable support foot (2) with a support surface (3) for the structural side panels (21) and/or base panels (22) of the furniture (18), there being beneath said support surface (3) an adjustment zone (4) with the vertical-adjustment screw head (11) and the depth-adjustment screw head (8a), which are both directly accessible beneath the furniture (18).

[0022] The vertical-adjustment screw head (11) has a vertical-adjustment shaft (12), the end of which is fitted with a ring gear (13) that meshes with the pinion gear (14a) of a threaded rod (14), said threaded rod (14) being provided with a coupling nut (15) to the anchoring plate (16) through the window (16b), in the movement of the

slider (17) with the slider guide (17a) thereof in the plate guide (16a).

[0023] The depth-adjustment screw (8) of the depth-adjustment screw head (8a) is attached to the projection (7) of the guider (6), which is guided along the guider channel (5) of the adjustable support foot (2); said guider (6) having a front wall (10) that can butt against the base panel (22) of the furniture (18).

[0024] The invention provides for the overhanging furniture (18) to be supported on at least two lower levelling support elements (1), which are located on the side panels (21) of the furniture (18). The support surface (3) of the adjustable support foot (2) is U-shaped, which facilitates reception of the side panel (21) and/or base panel (22) of any of the sides of the furniture (18).

[0025] Another noteworthy feature of the invention is that the lower levelling support element (1) is symmetrical, i.e. it is neither left- nor right-sided, which helps to significantly reduce both manufacturing and assembly costs. Furthermore, there is a risk of bowing when installing longer furniture (18). In this case, the lower levelling support element (1) proposed can be installed halfway between the side panels (21) of the furniture (18), thereby avoiding the aforementioned problem, as the furniture (18) need not be machined in any way to install the lower levelling support element (1).

[0026] The end of the threaded rod (14) opposite the pinion gear (14a) has a stop (25) for the threaded rod (14) connected to the anchoring plate (16) through the window (16d) of the anchoring plate (16).

[0027] The simplicity of construction and assembly is evident from the exploded view in Figure 4, which clearly shows that the lower levelling support element (1) is built using simple and rapid component assembly operations, without the need for other linking or fastening means, which facilitates and reduces the cost of manufacture and assembly. The assembly sequence is illustrated in Figure 4, in which the arrow (26) indicates the assembly position for the stop (25) for the threaded rod (14). Said stop (25) helps to ensure that the pinion gear (14a) of the threaded rod (14) does not bear all of the force and the moment generated by the weight of the furniture (18) when it is installed on the wall (20).

[0028] Figures 6 and 7, using the cross sections A-A' and B-B' indicated in Figure 5, illustrate the depth adjustment and vertical adjustment respectively.

[0029] Vertical and depth adjustment are clearly shown in Figures 6 and 7. Depth adjustment (Figure 6), which establishes a series of relative positions between the wall (20) and the side panel (21) and the base panel (22) of the furniture (18), is effected by turning the depth-adjustment screw head (8a) in either direction using a rotary actuator tool (24), without interfering with the furniture (18). To do so, the depth-adjustment screw (8) is connected to the projection (7), which results in a horizontal movement of the guider (6) along the guider channel (5) of the adjustable support foot (2); the base panel (22) of the furniture (18) bears against the front wall (10) of the guider (6), and consequently the successive positions thereof result in tilting of th e furniture (18) in one direction or the other, thereby adjusting the depth.

[0030] Vertical adjustment (Figure 7) is achieved by rotating in either direction, using a rotary actuating tool (24) and without interfering with the furniture (18), the vertical-adjustment screw head (11) comprising a vertical-adjustment shaft (12), the end of which is fitted with a ring gear (13), that meshes with the pinion gear (14a) of the threaded rod (14), which is provided with a coupling nut (15) to the anchoring plate (16).

[0031] The foregoing results in a vertical movement of the threaded rod (14) that, on account of the coupling of the coupling nut (15) to the anchoring plate (16), transforms the movement of the vertical-adjustment screw head (11) into movement of the slider (17) of the adjustable support foot (2) along the guides (16a) of the anchoring plate (16) in conjunction with the guides (17a) of the slider (17).

[0032] Thus, the movement causes a vertical movement of the adjustable support foot (2) as shown in Figure 7, where the structural side panel (21) and/or base panel (22) of the furniture (18) are butted together.

[0033] T h i s detailed description demonstrates the aforementioned simplicity of the design provided, as well as the functional reliability and efficiency thereof, th e capacity fo r final self-adjustment thereof, and the absence of mechanical connections likely to cause faults, require maintenance work or suffer mechanical degradation over time; as well as the reversibility thereof, which permits assembly on either of the side panels (21) of the furniture (18) indistinctly.

Claims

1. Lower levelling support element for overhanging wall-mounted furniture anchored to the wall, **characterized in that** it includes an adjustable support foot (2) with a support surface (3) for the structural side panels (21) and/or base panels (22) of the furniture (18), there being beneath said support surface (3) an adjustment zone (4) with the vertical-adjustment screw head (11) and the depth-adjustment screw head (8a), which are directly accessible from beneath the furniture (18).

2. Lower levelling support element for wall-mounted furniture according to Claim 1, **characterized in that** the vertical-adjustment screw head (11) has a vertical-adjustment shaft (12), the end of which is fitted with a ring gear (13) that meshes with the pinion gear (14a) of a threaded rod (14), said threaded rod (14) being provided with a coupling nut (15) to the anchoring plate (16) through the window (16b), in the movement of the slider (17) with the slider guide (17a) thereof in the plate guide (16a).

3. Lower levelling support element for wall-mounted furniture according to the preceding claims, **characterized in that** the depth-adjustment screw (8) of the depth-adjustment screw head (8a) is attached to the projection (7) that is guided on the guider channel (5) of the adjustable support foot (2), said guider (6) of the adjustable support foot (2) having a front wall (10) that can butt against the base panel (22) of the furniture (18).

4. Lower levelling support element for wall-mounted furniture according to the preceding claims, **characterized in that** the support surface (3) of the adjustable support foot (2) i s U-shaped, which facilitates reception of the side panel (21) and/or base panel (22) of any of the sides of the furniture (18).

5. Lower levelling support element for wall-mounted furniture according to the preceding claims, **characterized in that** the coupling nut (15) is coupled to the anchoring plate (16) through windows (16b) in said anchoring plate (16), the height of the sides of the window (16b) being the same as the coupling nut (15).

6. Lower levelling support element for wall-mounted furniture according to the preceding claims, **characterized in that** the end of the threaded rod (14) opposite the pinion gear (14a) has a stop (25) for the threaded rod (14) joined to the anchoring plate (16) through the window (16d) of the anchoring plate (16).

7. Lower levelling support element for wall-mounted furniture according to the preceding claims, **characterized in that** the guide (17a) of the slider (17) fits the guide (16a) of the anchoring plate (16).

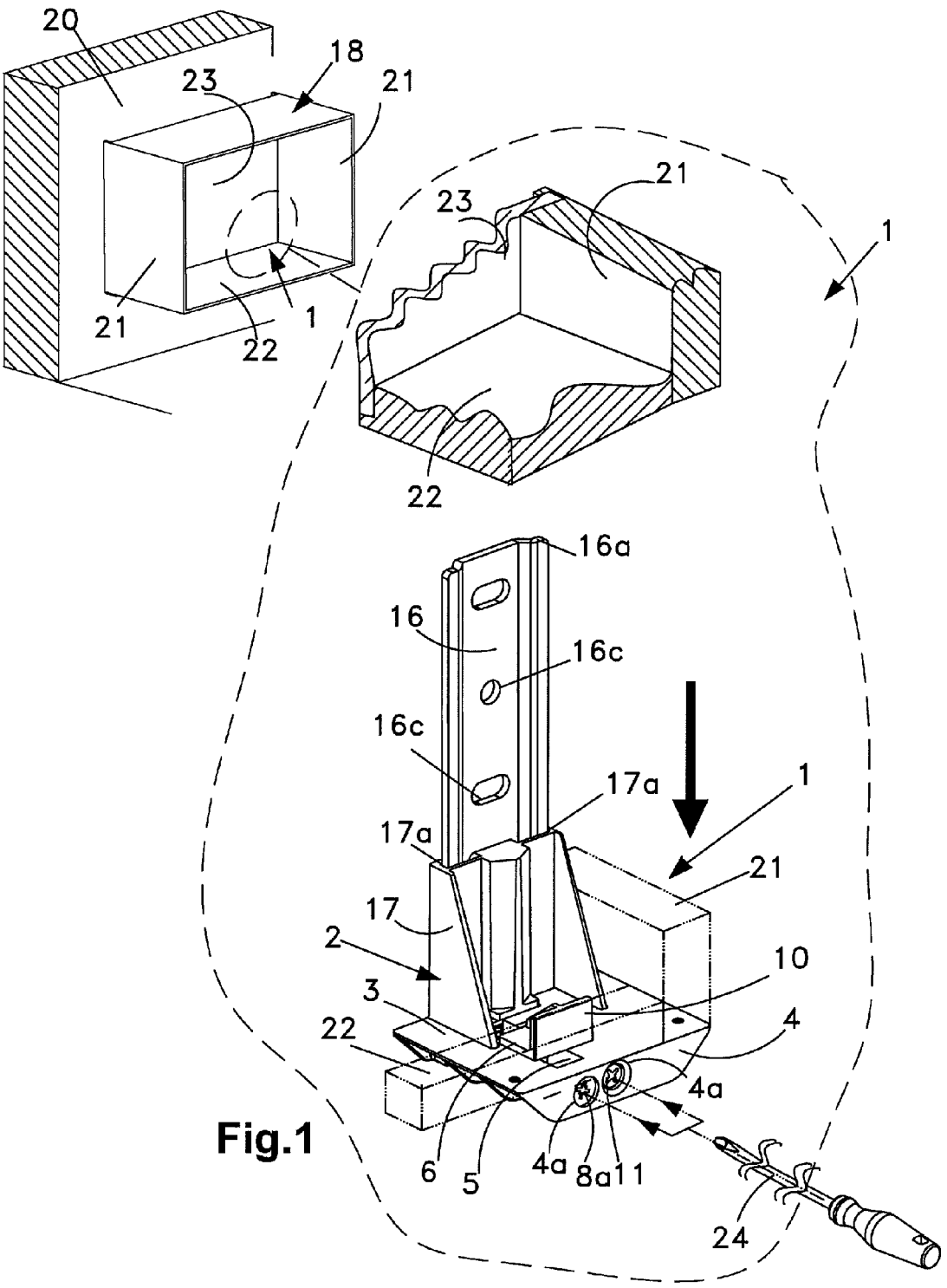
20
18
23
21
21
22
1
21
23
1
22
16a
16
16c
16c
17a
17a
1
21
17
2
10
3
4
22
4a
6
5
4a
8a
11
24

Fig.1

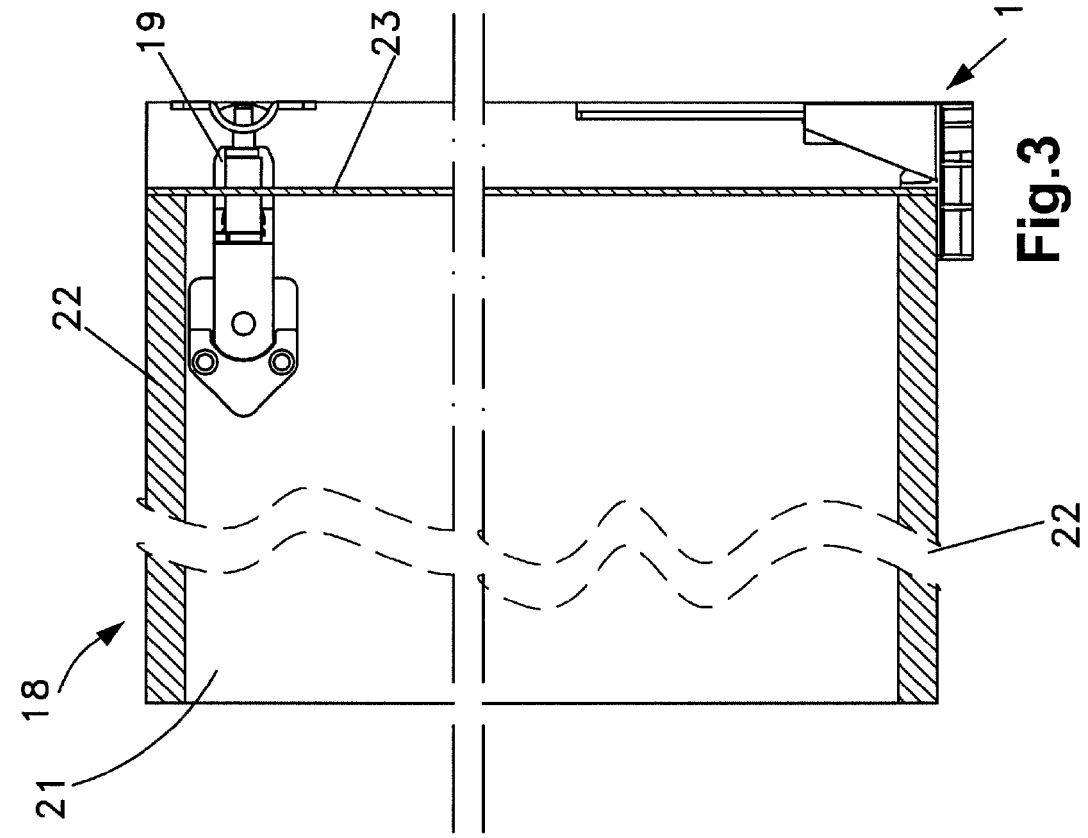

Fig.3

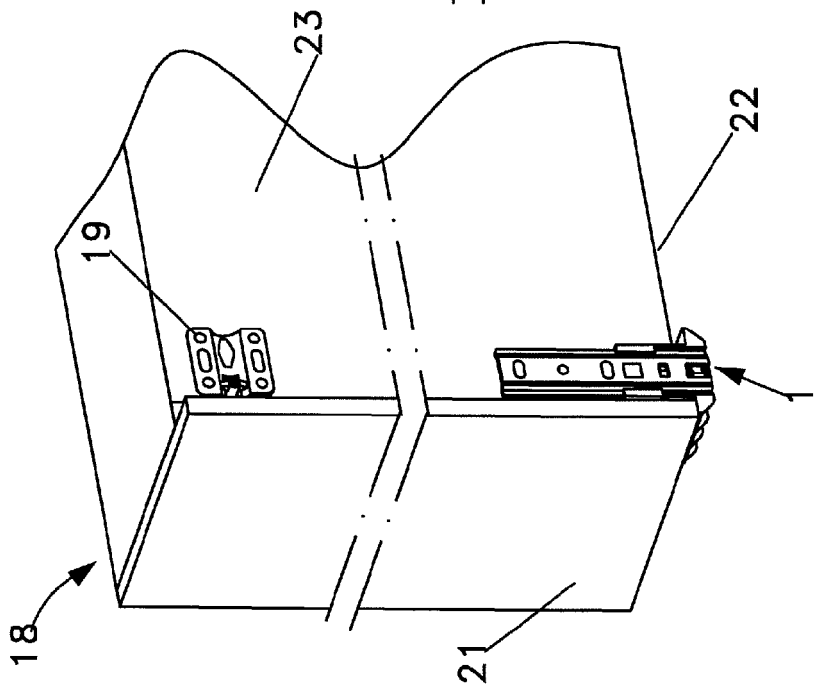

Fig.2

2
10
6
3
17
15
14
17a
14a
17a
25
26

Fig.4a

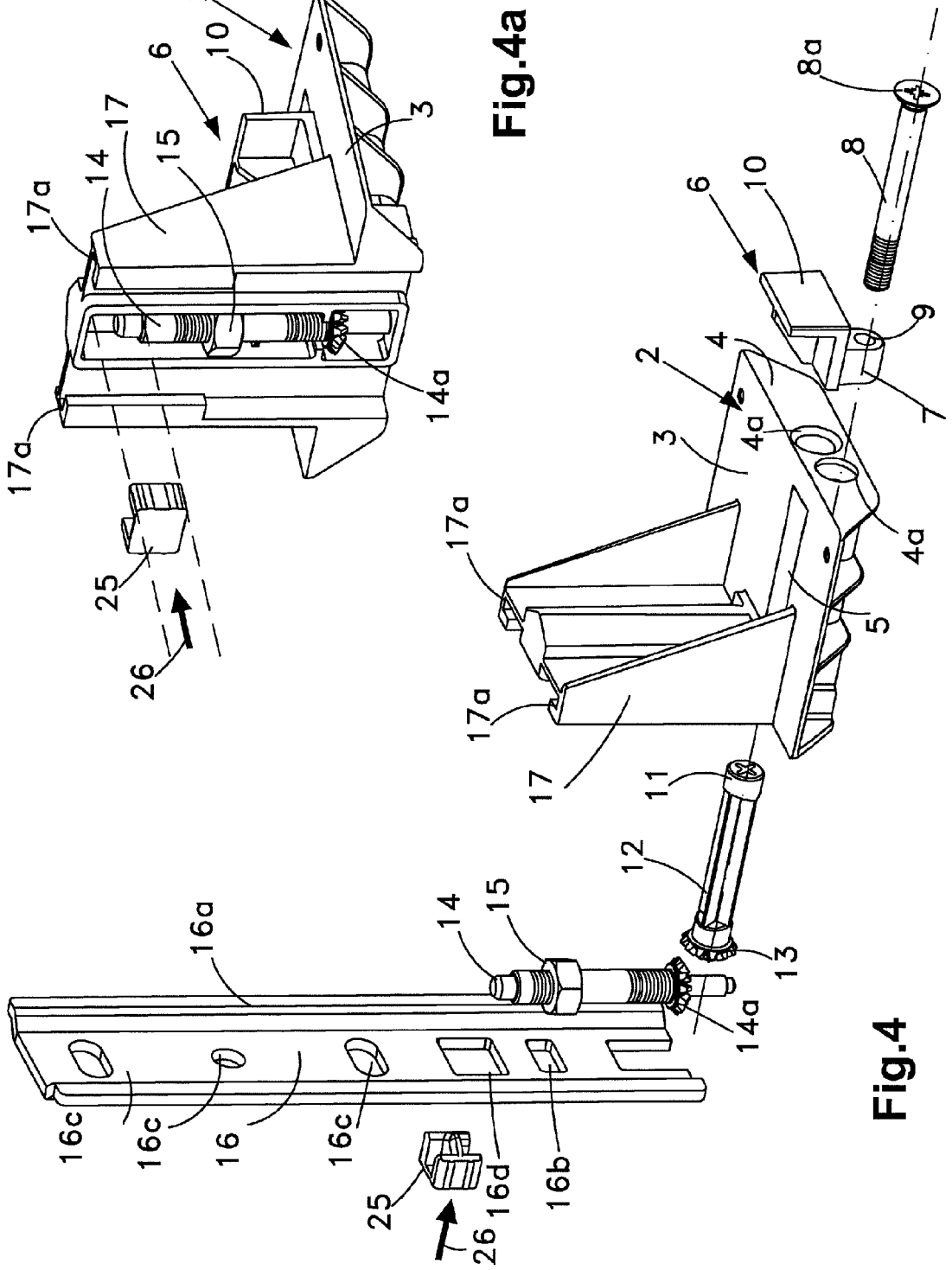
8a
8
6
10
9
4
2
7
3
4a
4a
5
17a
17a
17
11
12
13
14a
16a
14
15
16c
16c
16
16c
16d
16b
25
26

Fig.4

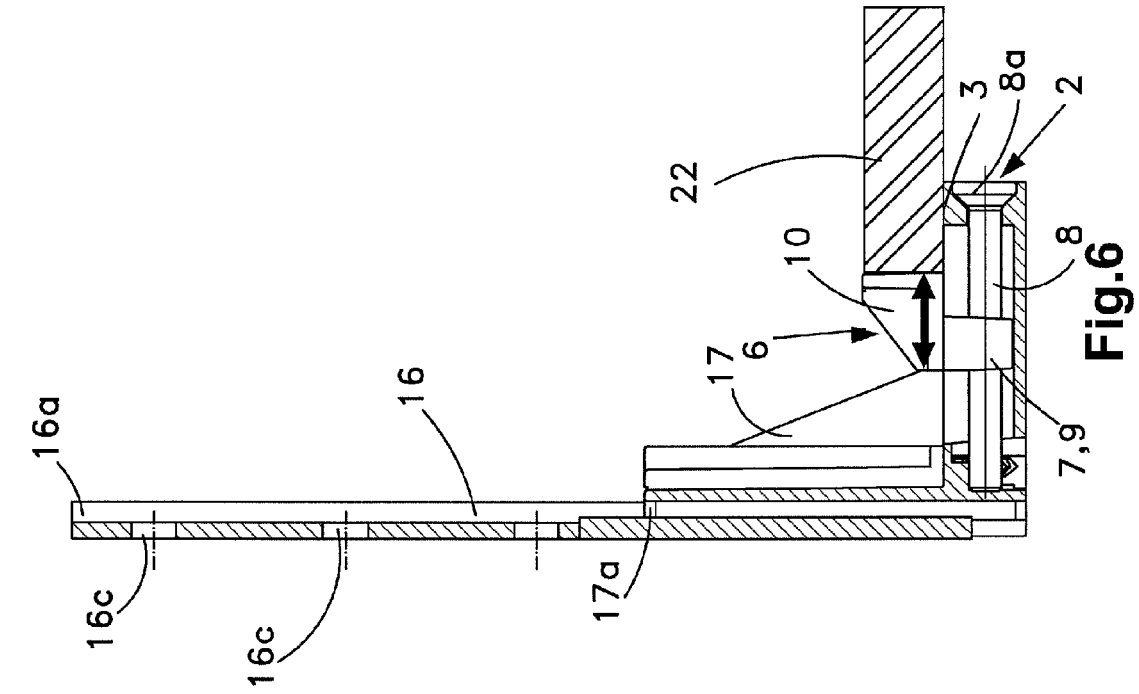
16a
16
22
3
8a
2
10
8
17
6
7,9
16c
16c
17a

Fig.6

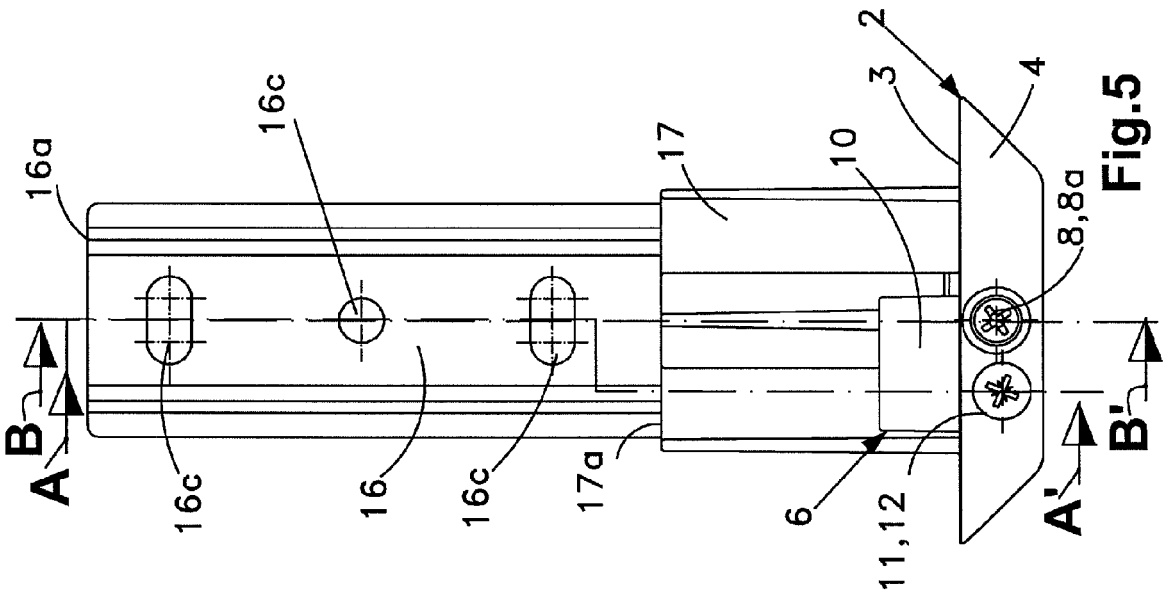
16a
16c
17
10
2
3
4
8,8a
B
A
16c
16
16c
17a
6
11,12
A'
B'

Fig.5

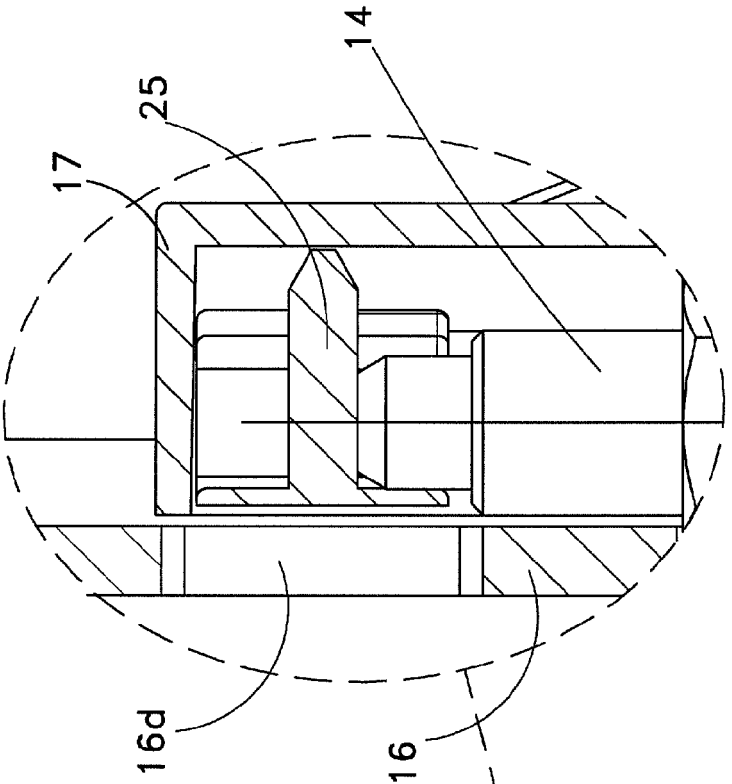
14
25
17
16d
16

Fig.7a

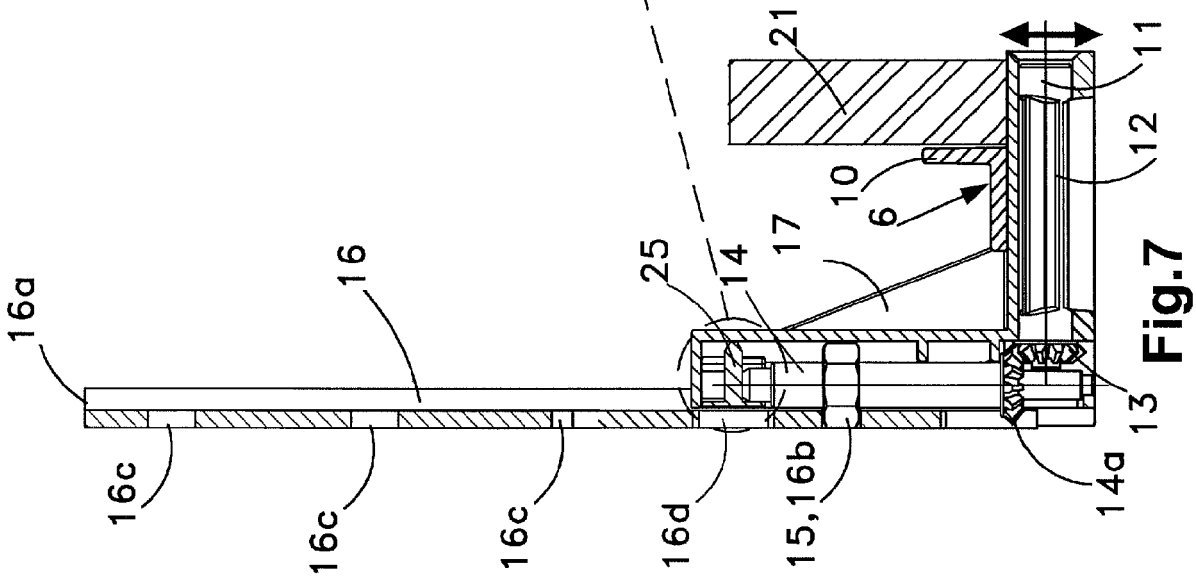
21
11
12
10
6
17
25
14
16
16a
16c
16c
16c
16d
15,16b
13
14a

Fig.7

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EUROPEAN SEARCH REPORT

Application Number
EP 11 16 0481

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 October 2011	Linden, Stefan

CATEGORY OF CITED DOCUMENTS

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1

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