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(54) **CLOSURE DEVICE FOR MOVABLE FURNITURE PARTS**

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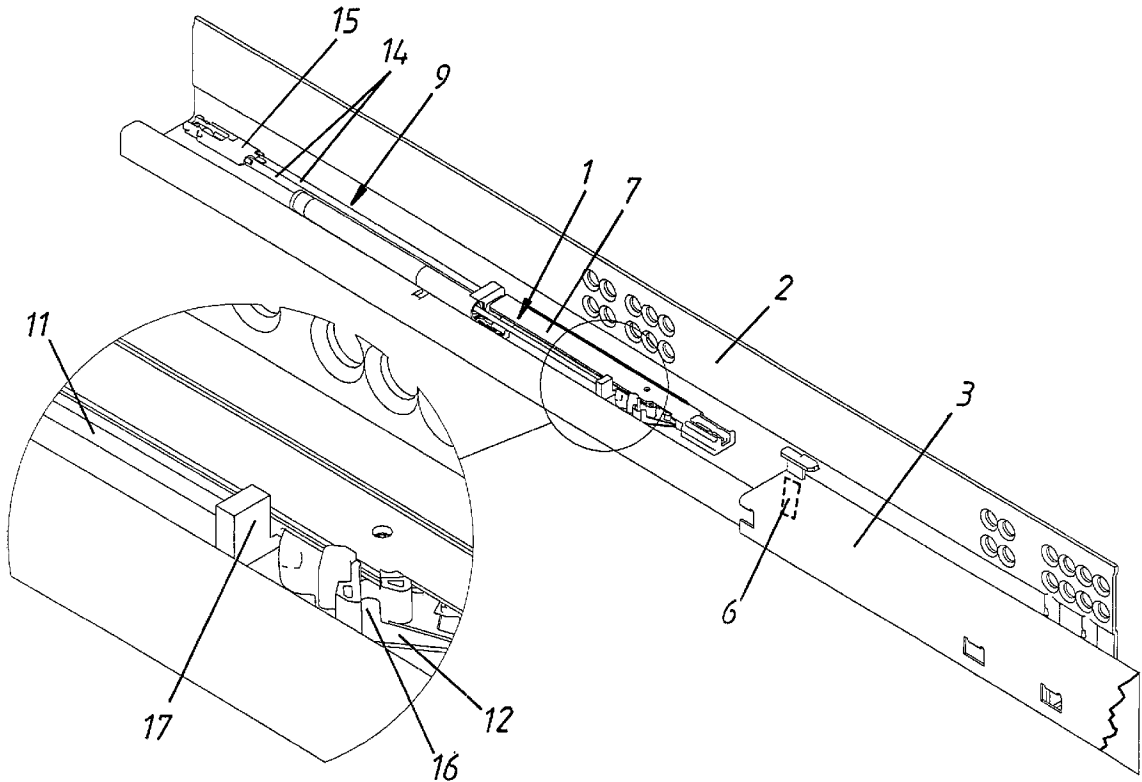
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(57) **ABSTRACT**

A closure device for movable furniture parts is combined with a closure damping mechanism, which is formed by a fluid damper. The fluidic damper is either a rotational damper or a linear damper. When opening the drawer the closure device will move independently of the closure damping mechanism.

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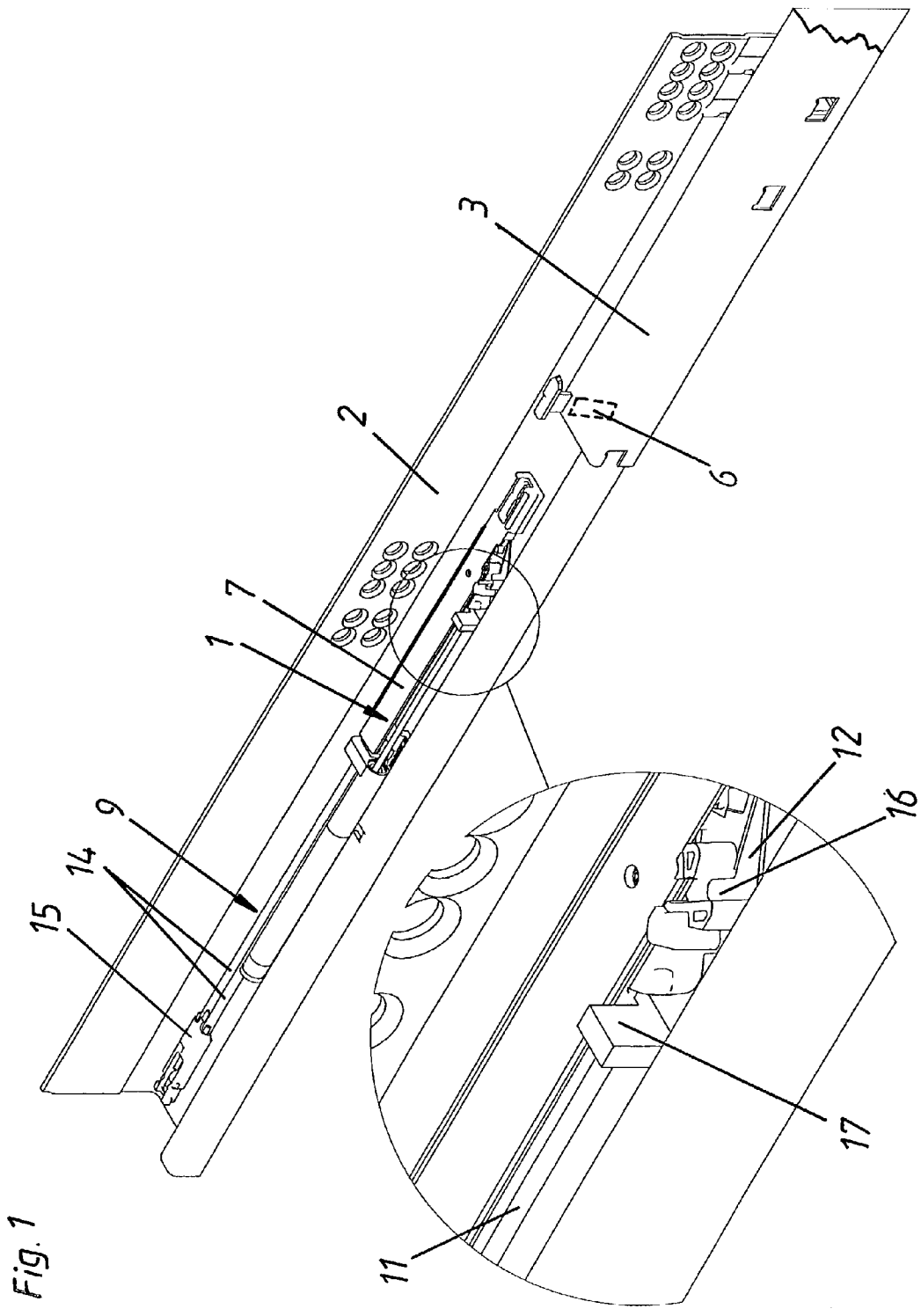


Fig. 1

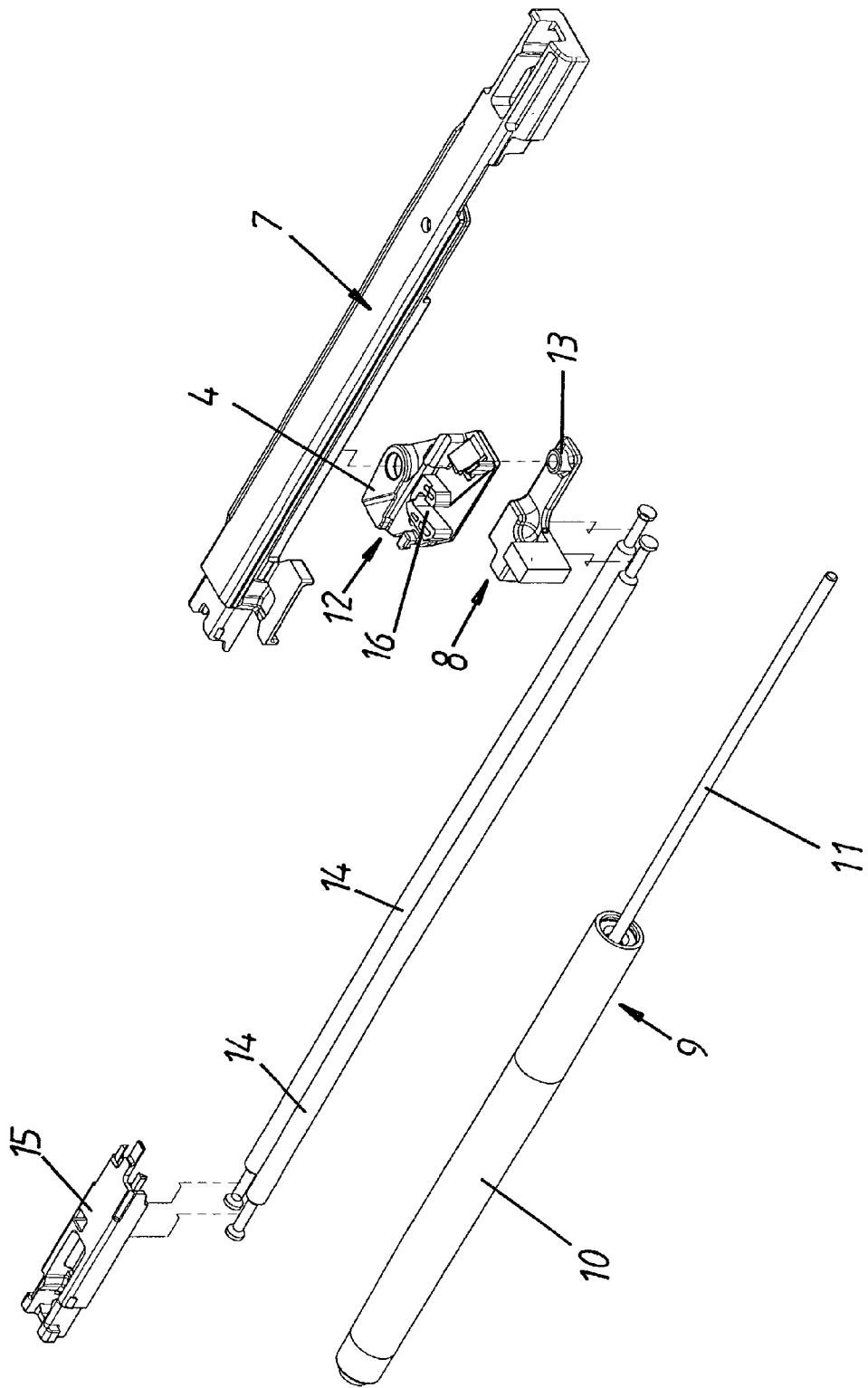
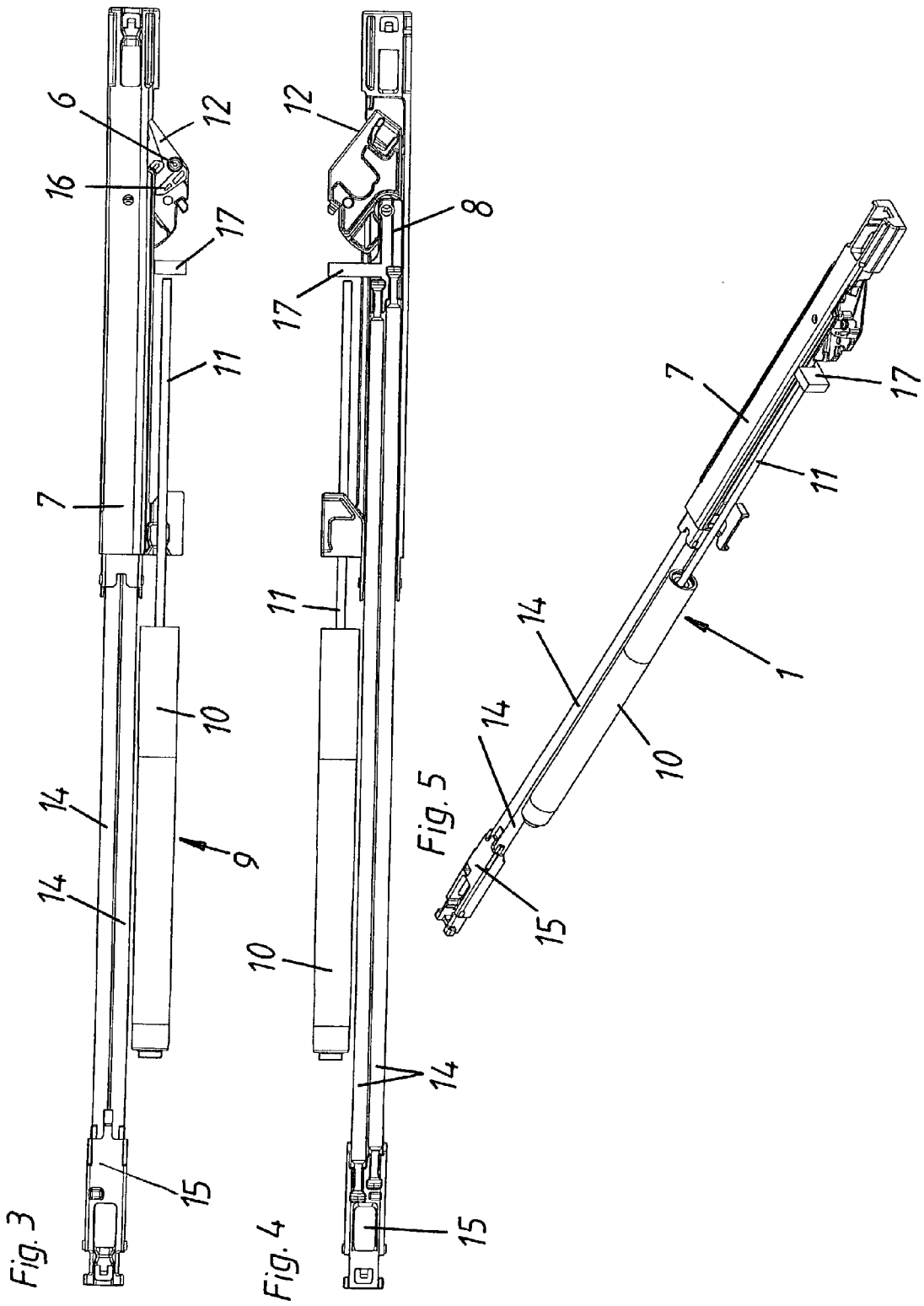
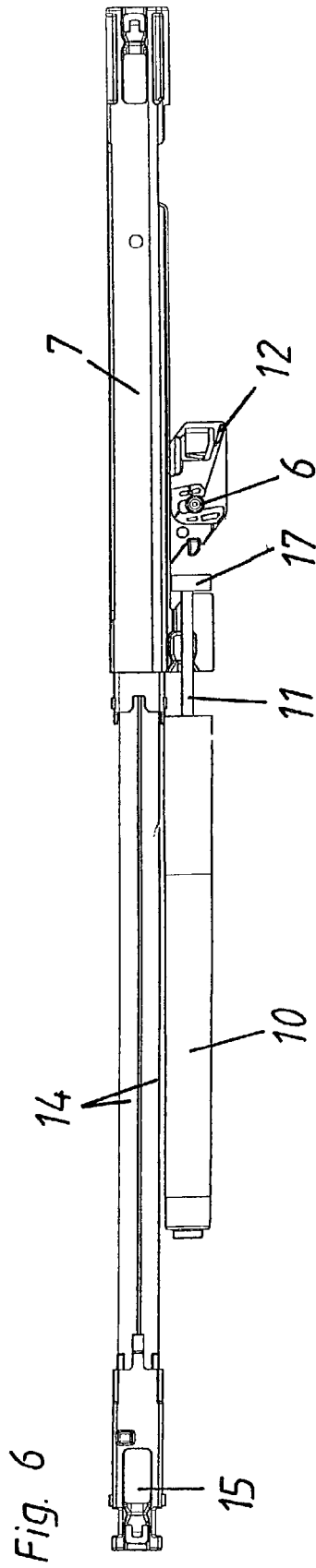


Fig. 2





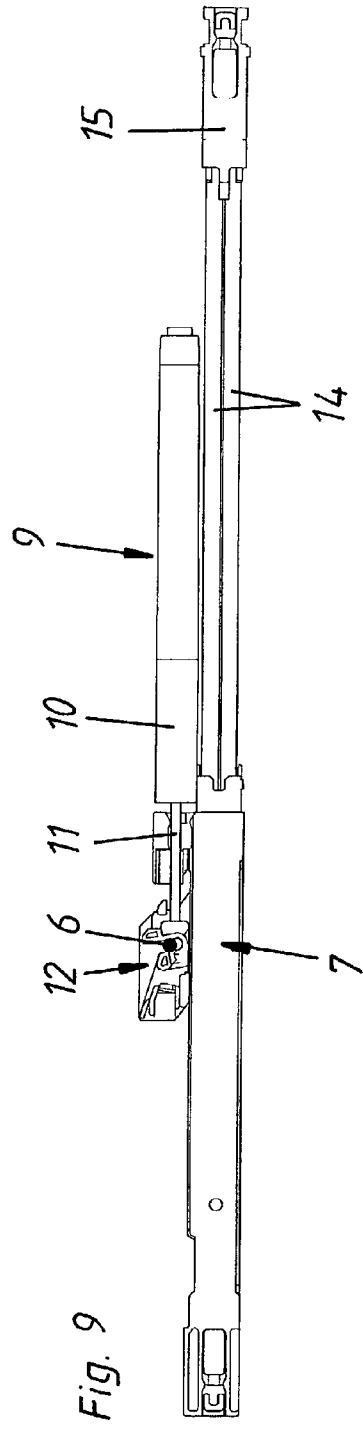
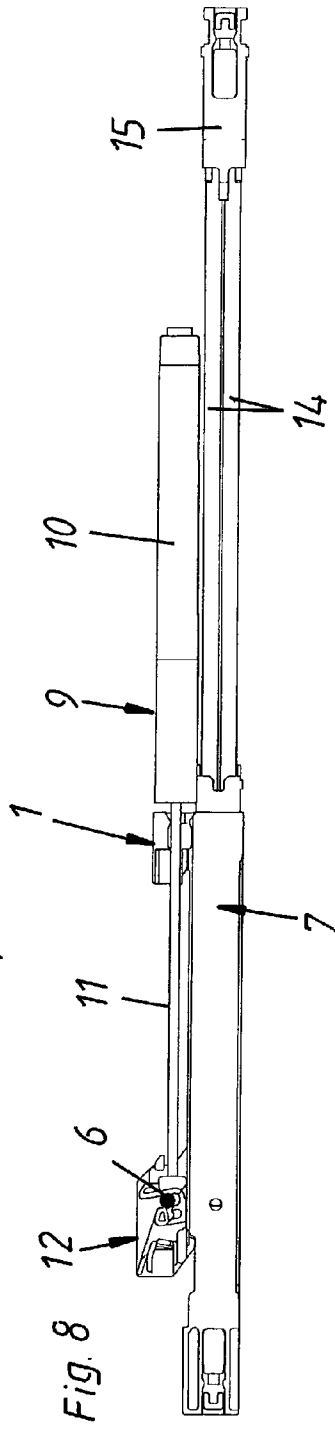
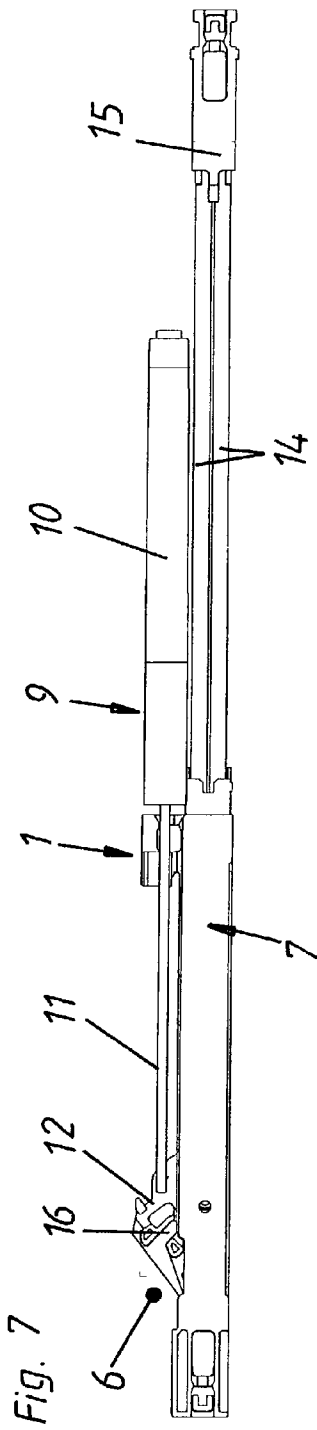
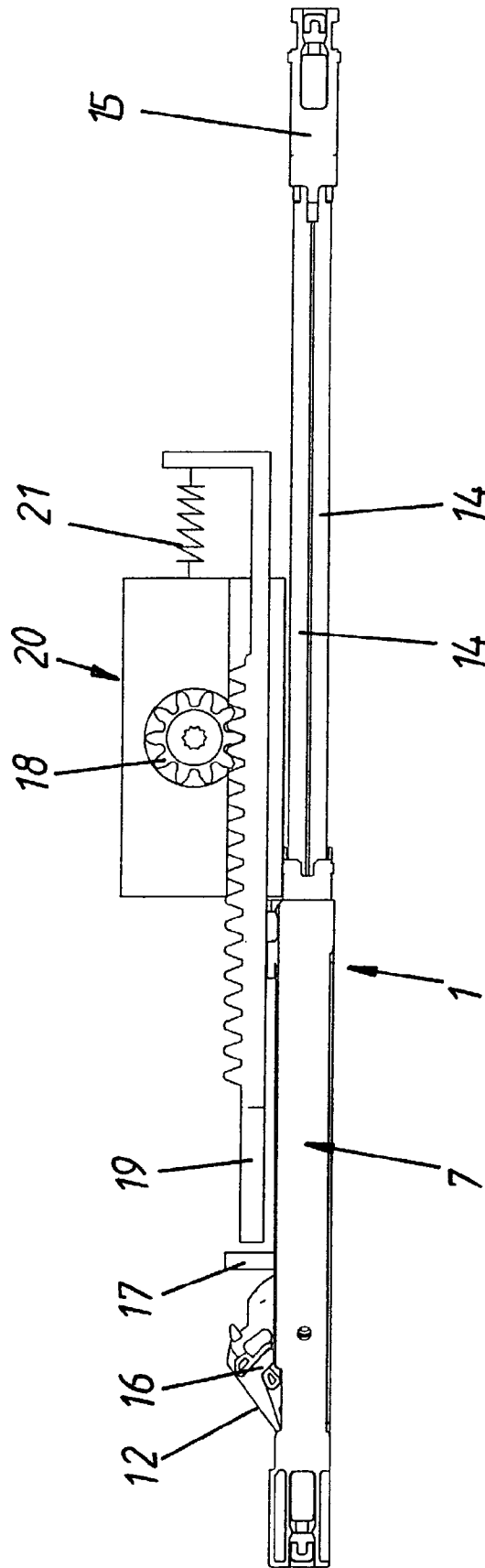


Fig. 10



CLOSURE DEVICE FOR MOVABLE FURNITURE PARTS

BACKGROUND OF THE INVENTION

[0001] The invention relates to a closure device for movable furniture parts with a displaceable slide, acted upon by a spring, which can be detachably coupled via a catch member with a furniture part, and with a fluid damper which dampers movement of the slide towards the closed position.

[0002] The invention further relates to a closure device for movable furniture parts with a displaceable catch device acted upon by a spring for movably coupling a furniture part and being moved by said spring in a closed position, a fluid damper being provided which dampers the movement of said catch device into said closed position.

[0003] Such a closure and/or pull-in device is known, for example, from EP 1 120 066 A2. Therein, a drawer, freely displaceable over a major portion of its pull-out range, is engaged at its rearward pull-in region by a catch of the closure device and reliably pulled into a rearward end position, i.e. it is closed. The closure device is provided with a rotational damper by means of which a gentle closing process is attained. Such a closing device is also applicable to a door.

SUMMARY OF THE INVENTION

[0004] It is an object of the invention to improve such a closure device to the extent that opening of the drawer at a high velocity will not result in fast movement of the damper. Such fast movement of the damper can result in a reduced service life of the closure device.

[0005] The object according to the invention is met in that the fluid damper is separated from the slide and is provided with a stop which is abutted by the slide during its closing movement.

[0006] A further example of the invention provides that said catch device is in the form of a toggle part, said toggle part abutting directly an activating part of said fluid damper without being connected thereto.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0007] In the embodiments shown the closure device 1 is mounted on the support rail 2 of a pull-out guide assembly. The support rail 2 is to be mounted on the side wall of a cabinet. The pullout rail 3 of the pull-out guide assembly is provided with an arresting pin 6 which engages with a toggle part 12 of the closure device.

[0008] The closure device 1 is provided with a housing 7 which is mounted on a horizontal flange of the support rail 2.

[0009] In the housing 7 of the closure device 1 a slide 8 is supported so as to be linearly displaceable. The toggle part 12, which is the catch member of the closure device 1, is mounted on the slide 8 by means of an axle 13. The toggle part 12 is provided with a protrusion 4 which is situated in the housing 7.

[0010] Two springs 14 are mounted on a part 15 of the housing 7 and also on the slide 8.

[0011] In FIGS. 3 to 5 the slide 8 and the toggle part 12 are shown in their standby position. The toggle part 12 is tilted and held in its foremost position, by resting against a stop of the casing 7. When the drawer is closed and the pull-out rail 3 is moved into the cabinet the arresting pin 6 is moved into the notch 16 of the toggle part 12. By further movement of the arresting pin 6 the toggle part 12 is tilted and is moved out of its arrested position at the front of the casing 7 so that it can be pulled by the springs 14 to its rearward position. During this movement the projection 4 of the toggle part 12 engages in guiding means of the casing 7. By movement of the slide 8 and the toggle part 12 the pull-out rail 3 and consequently the drawer are moved into their rearmost position.

[0012] A fluid damper 9 is provided which is situated next to the housing 7 of the closure device 1.

[0013] In the embodiments of the FIGS. 1 to 9 the fluid damper 9 is a linear damper with a cylinder 10 in which a piston is linearly displaceable. The piston is provided with a piston rod 11. The free end of the piston rod 11 is an abutment means for the slide 8 or the toggle part 12.

[0014] In the embodiments of FIGS. 1 to 6 the free end of the piston rod 11 abuts the slide 8. The slide 8 is provided with a lateral projection 17 which during the damping movement is in direct contact with the free end of the piston rod 11. In the standby position the free end of the piston rod 11 may abut projection 17 or may be at a small distance from this projection.

[0015] It is essential that, when the drawer is opened and the slide 8 and the toggle part 12 are pulled into their forward position, the piston rod 11 will not be pulled by the slide 8. The projection 17 of the slide 8 can be moved away from the free end of the piston rod 11 and the piston of the damper 9 can be moved forward independently of the movement of the slide 8 and the toggle part 12 for example by means of a spring situated within the cylinder 10. As the piston of the damping device 9 moves much slower than the slide 8 with the toggle part 12 there is no danger that air will be sucked into the cylinder 10.

[0016] In the embodiment of FIGS. 7 to 9 the free end of the piston rod 11 abuts the toggle part 12. FIG. 7 shows the situation when the toggle part 12 and the piston rod 11 are in the standby position. After the arresting pin 6 has engaged in the notch 16 of the toggle part 12, the toggle part 12 is tilted into the position shown in FIG. 8. Now, the toggle part 12 is moved by action of the springs 14 into its rearmost position shown in FIG. 9. During this rearward movement the toggle part 12 pushes the piston rod 11 of the damper 9 into the cylinder 10 so that the movement of the toggle part 12 together with the movement of the drawer will be dampened.

[0017] When the drawer is opened the toggle part 12 is moved away from the free end of the piston rod 11 and the piston rod 11 is free to move into its standby position at a speed which is independent from the speed of the toggle part 12.

[0018] In the embodiment of FIG. 10 the fluid damper 20 is a rotation damper. The damper 20 is provided with a pinion 18 which meshes with a rack 19. When the slide 8 and the toggle part 12 are moved into their rearward position, that is the closed position for the drawer by means of the

springs 14, the lateral projection 17 of the slide 8 will abut the free end of the rack 19 and move the rack 19 rearwardly. By this rearward movement the pinion 18 is rotated and the movement of the closure device 1 is dampened by the damping device 20.

[0019] When the drawer is opened the lateral projection 17 of the slide 8 will be moved away from the rack 19 and the rack 19 is slowly brought into its standby position by means of the spring 21.

1. A closure device for movable furniture parts with a displaceable slide, acted upon by a spring, which can be detachably coupled via a catch member with a furniture part, and with a fluid damper which dampens movement of the slide towards the closed position, characterised in that the fluid damper is separated from the slide and is provided with a stop which is abutted by the slide during its closing movement.

2. A closure device as claimed in claim 2, wherein the fluid damper comprises a cylinder and a piston linearly displaceable in said cylinder with a piston rod having a free end, said free end acting as said stop.

3. A closure device as claimed in claim 1, wherein the slide is provided with a projection which abuts said stop during the closing movement of the slide.

4. A closure device as claimed in claim 3, wherein the projection projects side wards of the slide.

5. A closure device as claimed in claim 1, wherein said stop is a free end of a drive rod which actuates a rotational damper.

6. A closure device as claimed in claim 5, wherein said drive rod is in the form of a rack which meshes with a pinion of said rotational damper.

7. A closure device for movable furniture parts with a displaceable catch device acted upon by a spring for movably coupling a furniture part, said catch device being moved by said spring into a closed position, a fluid damper being provided which dampens the movement of said catch device into said closed position, wherein said catch device is in the form of a toggle part, said toggle part when moved into the closed position abutting directly an activating part of said fluid damper without being connected thereto.

8. A closure device as claimed in claim 7, wherein the toggle part is provided with a notch for engaging an arresting pin of a furniture part, said actuating part of said fluid damper abutting said toggle part next to said notch.

9. A closure device as claimed in claim 7, wherein said toggle part is provided with a lateral projection said actuating part of said fluid damper abutting said projection.

10. A closure device as claimed in claim 7, wherein the fluid damper comprises a cylinder and a piston linearly displaceable in said cylinder, with a piston rod having a free end, said piston rod acting as said stop.

11. A closure device as claimed in claim 7, wherein said stop is a free end of a drive rod which actuates a rotational damper.

12. A closure device as claimed in claim 11, wherein said drive rod is in the form of a rack which meshes with a pinion of said rotational damper.

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