

(19) **DANMARK**

(10) **DK/EP 3248503 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

-
- (51) Int.Cl.: **A 47 B 77/10 (2006.01)** **A 47 B 88/00 (2017.01)**
- (45) Oversættelsen bekendtgjort den: **2019-10-21**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2019-07-31**
- (86) Europæisk ansøgning nr.: **17000907.0**
- (86) Europæisk indleveringsdag: **2017-05-29**
- (87) Den europæiske ansøgnings publiceringsdag: **2017-11-29**
- (30) Prioritet: **2016-05-27 DE 102016006467**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
- (73) Patenthaver: **Kesseböhmer Holding KG, Mindener Straße 208, 49152 Bad Essen, Tyskland**
- (72) Opfinder: **BARKAU, Rene, Kurze Stiege 4, 49179 Ostercappeln-Venne, Tyskland**
Buschermöhle, Hermann, Ostlandstraße 12a, 49593 Bersenbrück, Tyskland
- (74) Fuldmægtig i Danmark: **AWA Denmark A/S, Strandgade 56, 1401 København K, Danmark**
- (54) Benævnelse: **BESLAG TIL ET MØBEL ELLER LIGNEDE.**
- (56) Fremdragne publikationer:
WO-A1-2004/100717
GB-A- 2 374 521
US-A1- 2014 135 994

The invention relates to a fitting for furniture or similar furnishings having a body, in particular for kitchen cabinets, comprising a translationally movable and/or pivotally movable pull-out rack which can be supported on a body and has at least one receptacle for supporting at least one item and has a damping device, wherein the movement of the pull-out rack can be braked by the damping device before reaching an end position in the body, and comprising a device for determining a loading state value of the pull-out rack (103), wherein the braking behaviour of the damping device can be automatically adjusted according to the determined loading state value of the pull-out rack (103).

A fitting for furniture, in particular a pull-out rack for a kitchen cabinet, comprising a damping system is known from DE 10 2008 029 775 A1, for example. For braking a movement of a furniture part that is movable relative to a body, a damping device is provided in this furniture fitting comprising a piston which can be guided in a displacement chamber, the displacement of the piston in the displacement chamber generating damping. In the process, a resilient torque is intended to be prevented during the braking process, in order to prevent a movement counter to the closing movement when a certain overpressure is generated during the closing movement. To do this, it is provided that the piston chamber is open at the back, the displaced fluid in the sliding chamber having to be fed into a larger volume. This prevents any potential undesired resilient torque. At the same time, certain damping properties that are pre-defined as fixed settings can be provided that are configured to a nominal load. This may be disadvantageous during everyday operation of a fitting of this type.

DE 20 2011 100 573 U1 discloses a fitting for furniture or similar furnishings having a body comprising a translationally movable and/or pivotally movable pull-out rack which can be supported on a body. This fitting is provided with a receptacle for supporting at least one item, it being possible to brake the movement of the pull-out rack by means of a damping device before reaching an end position within the body. Here, it is possible to use an acceleration sensor. For this purpose, movement profiles that are allocated to negative or positive acceleration of the movable furniture part can be stored in a data memory.

AT 414 004 B discloses a piece of furniture comprising at least one movable furniture part and a drive for moving the movable furniture part. In this document, a control and regulation apparatus is provided to control and regulate the drive unit, respectively, and a sensor device is provided that is used to detect movements of an object located outside the piece of furniture, the signals from which can be fed at least to the control and regulation apparatus. The control and regulation apparatus has an operating mode for driving the movable furniture part, in which the movable furniture part follows at least one movement component

of the object detected by the sensor device. If the sensor device detects an object, for example an operator's hand, the operating mode provides that the movable furniture part, for example a drawer, is guided according to the hand movement at a certain distance therefrom. It is also possible here for the movable furniture part to be in direct contact with the hand and follow the movement of the hand. Recognition of the loading state is not provided here, however.

DE 21 2007 000 006 U1 discloses a device for influencing the movement of furniture parts and furniture that can be moved towards one another, comprising a drive unit by means of which, via a control unit for controlling the movement of a first furniture part, said furniture part can be moved so as to be driven relative to a second furniture part. Here, the control unit is designed such that, after activation, the control unit operates in accordance with a program for the movement control of the first furniture part, with selection means being provided by means of which an alternative selection program for the movement control of the first furniture part can be activated instead of the control program. This does not make recognition of a loading state possible, however. US 2014/0135994 A1 discloses another fitting of the type in question.

The problem addressed by the present invention is to provide a fitting for furniture or similar furnishings having a body in which the translationally movable and/or pivotally movable pull-out rack can be more individually adjusted to everyday operation.

To solve this problem, the fitting of the type mentioned at the outset is characterised in that the fitting has a control device for actuating the damping device, and the control device and the device for determining a loading state value communicate via a radio link, via an infrared link, via ultrasound and/or via electrical cables.

Therefore, a fitting for furniture and similar furnishings is provided in which the damping device can be individually adjusted according to the loading of the pull-out rack, i.e. according to the weight loading of the pull-out rack, and specifically can be automatically adjusted, such that a furniture fitting is thus provided that is automatically individually adjusted to the loading state in everyday operation, such that the operator cannot perceive whether the pull-out rack is heavily loaded or less loaded.

This provides an increased level of comfort but also functional reliability to the effect that the device that individually influences the braking force that can be adjusted on the damping device for weight measurement as part of determining the loading state value adjusts the braking force according to the weight of the pull-out rack such that the braking force is

adjusted to be greater as the weight of the pull-out rack increases. This prevents an improperly triggered slide-in movement from causing damage. For this purpose, a weight detection device is preferably provided which interacts with a control device, by means of which the braking force can be adjusted. The weight detection device may comprise a weight change sensor in order to detect the changed weight ratios immediately after loading of the pull-out rack in the open position thereof, for example, in order to then accordingly adjust the braking force of the damping device even in the pulled-out state.

The damping device is controlled by means of a control device. Measured data may be transferred in various ways, by cables, via a radio link, via an infrared link, via ultrasound or via similar measured value transmission links. Sensors can be used in order to determine the loading state value. Deformation sensors, deformation change sensors, position sensors, position change sensors, speed sensors, speed change sensors, acceleration sensors and/or acceleration change sensors are thus suitable as technical components for determining the loading state value of the pull-out rack. Braking devices that can be used in the braking device are, for example, mechanical, electrical, fluid, magnetic or electrorheological dampers. Friction brakes, rotation brakes, induction or eddy current brakes, hysteresis brakes, hydrodynamic brakes, fluid brakes or similar brakes can be used for this purpose.

For example, as a weight sensor or weight change sensor, a load cell comprising a strain gauge can be arranged in or on the body of a piece of furniture in this case. If a telescopic pull-out is used, for example, strain gauges can be attached below the guide rail of the telescopic pull-out that is arranged on the base of the body. A piezoelectric sensor is provided as a deformation sensor, for example. Here, the amplitude and polarity can be an indicator of the weight or the weight change on the pull-out rack. A speed sensor or speed change sensor can be designed as a generator, for example. Here, the speed change over a defined distance is an indicator of the weight or weight change of the pull-out rack with a defined braking force.

The sensor, braking device and controller may be designed to be in one shared component. Here, an eddy current brake is also provided, for example. A position sensor or position change sensor may be designed as an inclination sensor, for example. For this purpose, it may be provided that, when loaded, the pull-out rack is lowered towards one side for example by a guide rail of a telescopic pull-out being resiliently supported on one side, for example by a spring. Here, the inclination is an indicator of the weight or the weight change on the pull-out rack. An acceleration sensor or acceleration change sensor may for example be designed as a micro-electromechanical system (MEMS). This sensor may be arranged in

or on the movable part of the fitting. Here, the negative acceleration over a defined distance is an indicator of the weight or weight change in the system with a defined braking force.

Further advantageous embodiments are found in the remaining dependent claims, the following description and the drawings, in which:

Fig. 1 is a side view of a first embodiment of a fitting for a piece of furniture comprising an extendable pull-out rack in the open position with a hydrodynamic brake as a damping device (compression damper), in the open position of the pull-out rack;

Fig. 2 is a view of the embodiment analogous to Fig. 1, in the closed position of the pull-out rack;

Fig. 3 is a view of the fitting analogous to Fig. 1 on a piece of furniture comprising a guide rail of a telescopic pull-out that is resiliently mounted on one side and a weight change sensor, in the open position of the pull-out rack;

Fig. 4 is a view of an alternative embodiment analogous to Fig. 3, comprising an adjustable electrical rotation brake as a damping device, in the open position of the pull-out rack;

Fig. 5 shows another alternative embodiment in addition to the embodiments according to Fig. 1, 3 and 4, comprising a guide rail (rear region) mounted on a roller and a spring element provided at the front as a support of the guide rail comprising an angle sensor and two adjustable fluid dampers;

Fig. 6 shows the embodiment according to Fig. 5 in the loaded state of the pull-out rack; and

Fig. 7 shows another alternative embodiment comprising a guide rail fastened to the base of the body.

In the drawings, essentially corresponding parts are provided with corresponding reference signs.

A piece of furniture is generally denoted by 100, and comprises a body 101, to the side walls 102 of which guide rails 2 of a pull-out rack 103 are fastened, in which guide rails telescopic rails 9 of the pull-out rack 103 are guided. The telescopic rails 9 bear supports (shown in detail) or a base for supporting items to be stored. The telescopic rails 9 are connected to a front-side furniture front 104 comprising an operating handle 105. The body 101 rests on feet 106.

In the embodiment according to Fig. 1, the pull-out rack 103 is shown in its pulled-out

position, this embodiment being shown in Fig. 2 in the closed position, in which the pull-out rack 103 is in the closed end position. Weight sensors 3 are arranged between the body base 1 of the body 101 and the guide rail 2 as a device for determining a loading state of the pull-out rack 103 in the form of load cells. These weight sensors 3 can determine the loading of the pull-out rack 103. The determined measured values are fed to a control unit 4 and are processed therein. In the embodiment according to Fig. 1 and 2, the damping device 5 is designed as a fluid brake or compression dampers comprising a variable flow channel (not shown). The variable flow channel can e.g. be implemented as a throttle valve or flow control valve that can be regulated by the controller. According to the determined weight, a corresponding cross section can be adjusted in the flow channel in a controlled manner by means of the control unit 4. Reducing the cross section of this flow channel ensures more intense deceleration of the telescopic rails 9 and enlarging this cross section ensures weaker deceleration of said telescopic rails during a slide-in movement of the pull-out rack 103. An automatic pull-in device may also be provided, but is not shown in detail. The loading of the pull-out rack 103 can be determined directly throughout the slide-in movement and can be passed to the deceleration member 5 or the damping device 5 by means of the control unit 4.

In the embodiment according to Fig. 3, the piece of furniture 100 is equipped with a pull-out rack 103 comprising guide rails 2 and telescopic rails 9, the guide rail 102 being rotationally supported, i.e. on rollers, in the rear region at 7.1. In the front region, a weight change sensor 7 is provided as a device for determining a loading state value. The change in loading is transmitted to the control unit 4 by said weight change sensor 7. The control unit analyses the data and controls the deceleration or braking member (damping device) according to the required deceleration on the basis of the determined loading state values. It is likewise possible to move the weight change sensor 7 into the rear region and to shift the position 7.1 forwards. As a result, the weight would be determined on the sensor by tension and not by compression.

Fig. 4 shows another alternative embodiment of a piece of furniture 100 comprising an adjustable electrical rotation brake as the damping device 5. The rotation brake may be designed as a hysteresis brake (not speed-dependent) or as an eddy current brake (speed-dependent). For this purpose, the damping device 5 has a friction wheel 10 that can be set into rotation during the slide-in movement. The damping device 5 and the rotation brake act as a generator, the generated voltage being determined by the control unit 4. The applied voltage is an indicator of the movement speed of the movably mounted telescopic rail 9. According to the determined speed, the adjustable load resistor 11 arranged in the control

unit 4 is adjusted. The adjusted load influences the required torque on the generator shaft. It is unimportant here whether the friction wheel 10 is in engagement over the entire track of the movably guided telescopic rail or only in partial segments. With this arrangement, in an indirect manner, both the loading state can be determined and used for the braking or deceleration, and also an excessively high speed can be determined that is exerted by the operator when sliding in the pull-out 103.

Fig. 5 is a side view of another alternative embodiment comprising guide rails 2 again supported on rollers in the rear region at 7.1 and a spring element 13 arranged so as to be spaced apart therefrom, an angle sensor 14 being assigned to the guide rail 2. Again, a control unit 4 and two controllable fluid dampers 15 are provided as the damping device, such that hydrodynamic components and an electrorheological fluid (ERF) are used.

Fig. 6 shows the embodiment according to Fig. 5 in the state loaded by the black weight, as a result of which the force K_g is acting on the telescopic rail 9 and the support 13 thereon in the vertical direction. The spring element 13 is compressed by the weight force of the loading or the item placed thereon. Owing to the resilient support of the guide rail 2, said rail lowers downwards (forwards), as a result of which the angle sensor 14 measures an angular change relative to the horizontal. The magnitude of the angular change is a direct measure of the loading. The determined angular change is analysed by the control unit 4. The damping device (fluid damper 15) is adjusted accordingly in line with the loading state value determined thereby in order to adjust the damping or braking during the transfer of the pull-out rack 102 into the sliding end position.

Here, the transmitted angular change can be stored at least for a short time in order to compensate for a displacement caused by the closing movement based on the pivot point of the guide rail 2 that is resiliently mounted on one side.

Fig. 7 shows another embodiment of a fitting according to the invention, comprising a guide rail 2 fastened to the base of the body and movably mounted telescopic rails 9. This embodiment shows an acceleration sensor 16 having at least one sensitive acceleration direction. The acceleration sensor 16 is connected to the movably mounted telescopic rail 9 and transmits the received sensor signals wirelessly to the receiving apparatus 17. The received signals are processed and the adjustable friction brake 18 in the form of the damping device is adjusted according to the required deceleration value that therefore needs to be set.

P A T E N T K R A V

1. Beslag til møbler (100) eller lignende indretningsgenstande, som har et legeme (101), især til køkkenskabsmøbler, med en udtræksramme (103), der kan understøttes på et legeme (101), og er translatorisk bevægelig og/eller svingbar, og har mindst én beholder til at understøtte mindst én genstand og har en dæmpningsanordning (5), hvor bevægelsen af udtræksrammen (103) kan bremses af dæmpningsanordningen (5) inden en slutposition, som ligger i legemet (101), nås, og som har en anordning til bestemmelse af en belastningstilstandsværdi af udtræksrammen (103), hvor bremsningsadfærden af dæmpeanordningen (5) kan ændres automatisk ifølge belastningstilstandsværdien af udtræksrammen (103), hvor beslaget har en styreanordning (4) til aktivering af dæmpeanordningen (5), og hvor kommunikationen mellem styreanordningen (4) og anordningen til bestemmelse af en belastningstilstandsværdi foregår via et radiolink, via et infrarødt link, via ultralyd og/eller via elektriske kabler.
2. Beslag ifølge krav 1, k e n d e t e g n e t ved, at anordningen til bestemmelse af en belastningstilstandsværdi af udtræksrammen (103) er udformet som en vægtdetekteringsanordning.
3. Beslag ifølge krav 2, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en vægtsensor (3).
4. Beslag ifølge et af kravene 1 til 3, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en vægtændringssensor (7).
5. Beslag ifølge et af kravene 1 til 4, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en deformationssensor.
6. Beslag ifølge et af kravene 1 til 5, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en deformationsændringssensor.
7. Beslag ifølge et af kravene 1 til 6, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en positionssensor.
8. Beslag ifølge et af kravene 1 til 7, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en positionsændringssensor.
9. Beslag ifølge et af kravene 1 til 8, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en hastighedssensor.
10. Beslag ifølge et af kravene 1 til 9, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en hastighedsændringssensor.
11. Beslag ifølge et af kravene 1 til 10, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en accelerationssensor (16).
12. Beslag ifølge et af kravene 1 til 11, k e n d e t e g n e t ved, at vægtdetekteringsanordningen har en accelerationsændringssensor.
13. Beslag ifølge krav 11 eller 12, k e n d e t e g n e t ved, at accelerationssensoren eller accelerationsændringssensoren er udført som et mikro elektro-mekanisk system (MEMS).

14. Armatur ifølge et af kravene 1 til 13, k e n d e t e g n e t ved, at dæmpningsanordningen er udformet som en mekanisk, elektrisk, fluid eller magnetisk dæmpningsanordning.

5 15. Beslag ifølge et af kravene 1 til 14, k e n d e t e g n e t ved, at dæmpningsanordningen har en friktionsbremse.

16. beslag ifølge et af kravene 1 til 15, k e n d e t e g n e t ved, at dæmpningsanordning har en induktions- eller hvirvelstrømbremse.

17. Beslag ifølge et af kravene 1 til 16, k e n d e t e g n e t ved, at dæmpningsanordningen har en hysteresebremse.

10 18. Beslag ifølge et af kravene 1 til 17, k e n d e t e g n e t ved, at dæmpningsanordningen har en hydrodynamiskbremse (5).

19. Beslag ifølge et af kravene 1 til 18, k e n d e t e g n e t ved, at dæmpningsanordningen har en fluidbremse.

15 20. Beslag ifølge et af kravene 7 eller 8, k e n d e t e g n e t ved, at positions- eller positionsændringssensoren er udformet som en hældningssensor (14).

21. Beslag ifølge et af kravene 1 til 20, k e n d e t e g n e t ved, at dæmpningsanordningen har en elektro-reologisk fluiddæmper.

22. Beslag ifølge et af kravene 1 til 21, k e n d e t e g n e t ved, at udtræksrammen (103) er elastisk understøttet på mindst ét punkt.

20 23. Beslag ifølge krav 22, k e n d e t e g n e t ved, at udtræksrammen (103) ved mindst ét punkt understøttes via mindst én fjeder.

Fig. 1

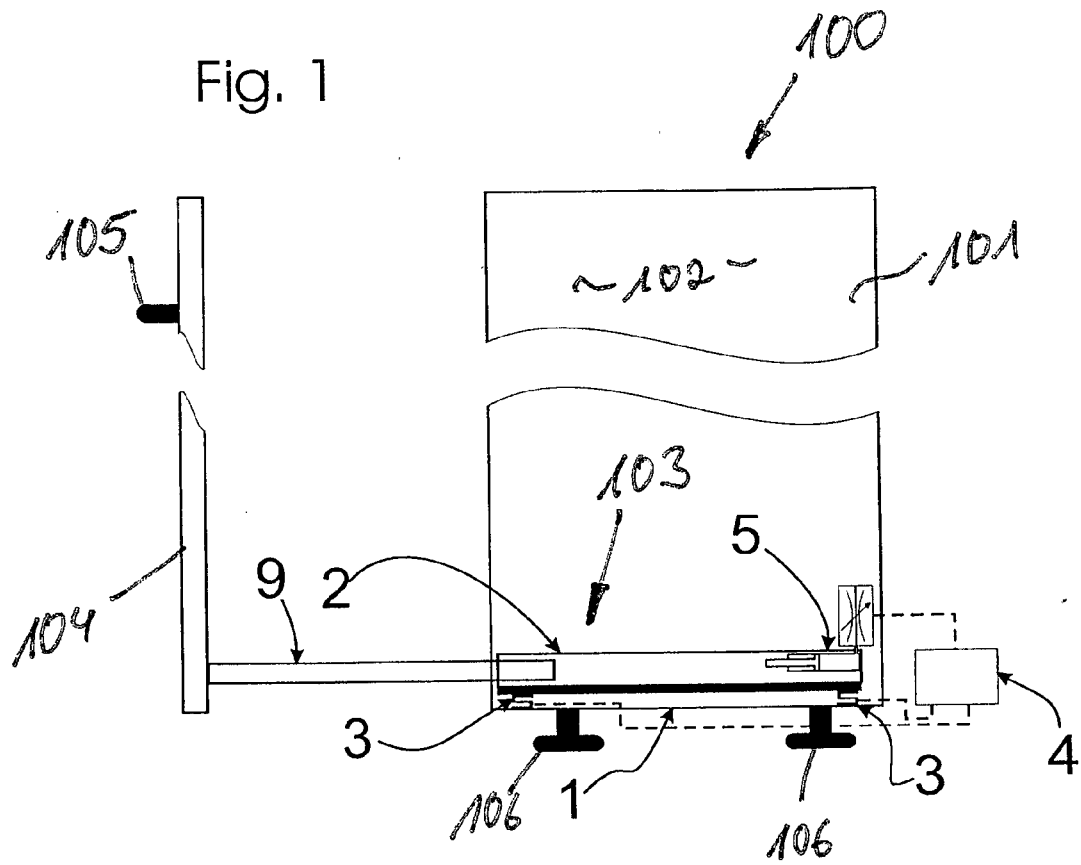


Fig. 2

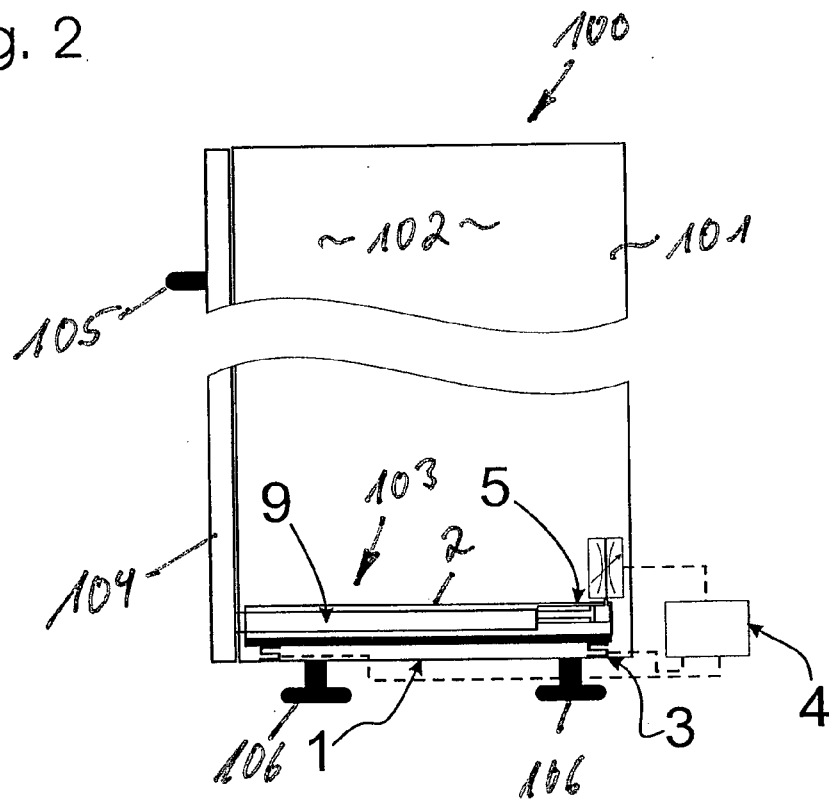


Fig. 3

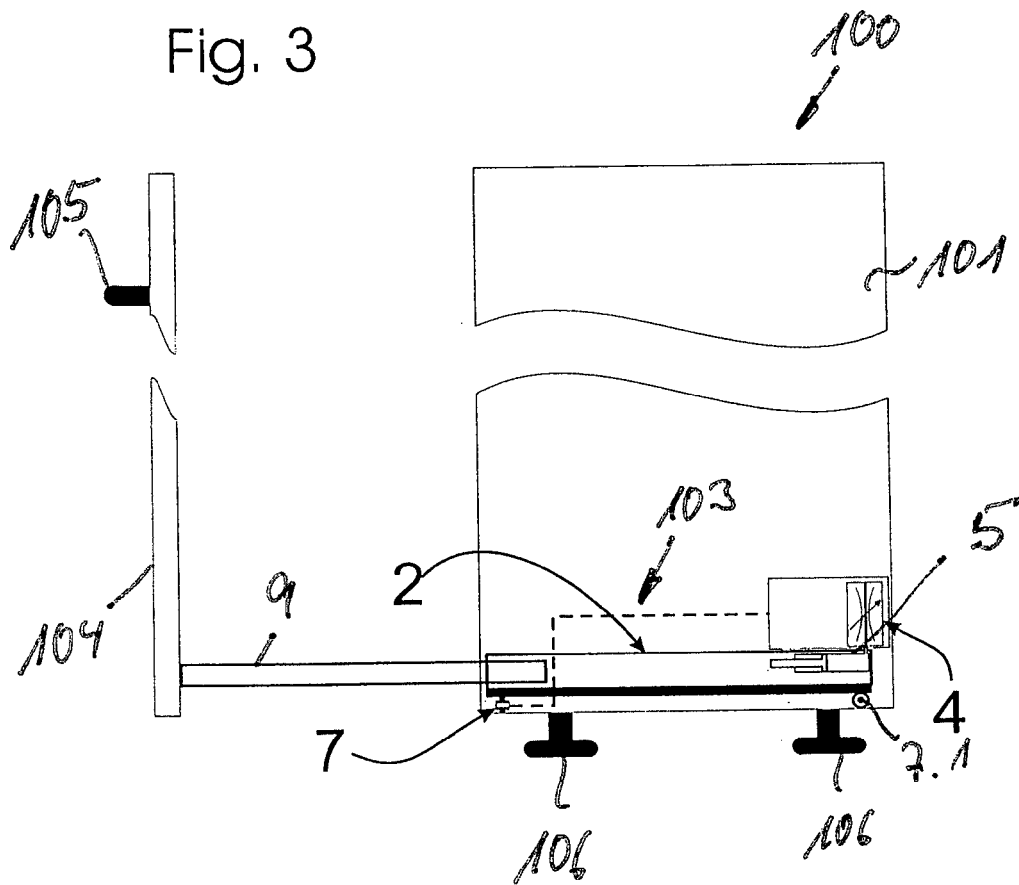


Fig. 4

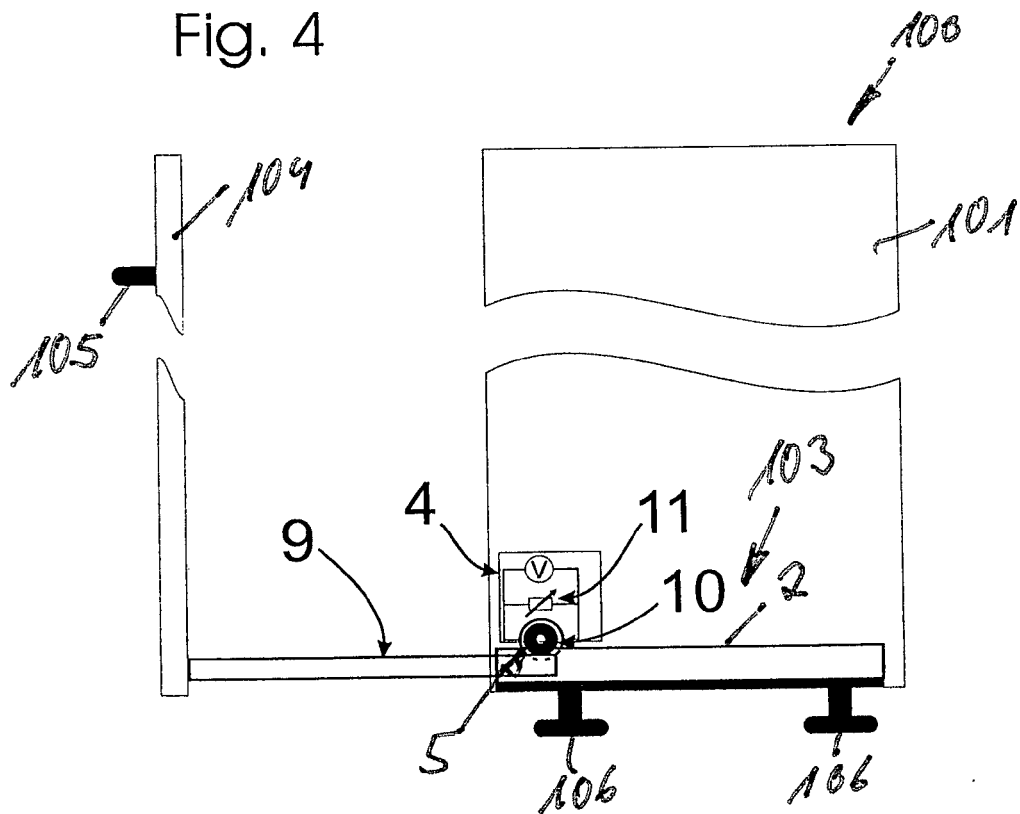


Fig. 5

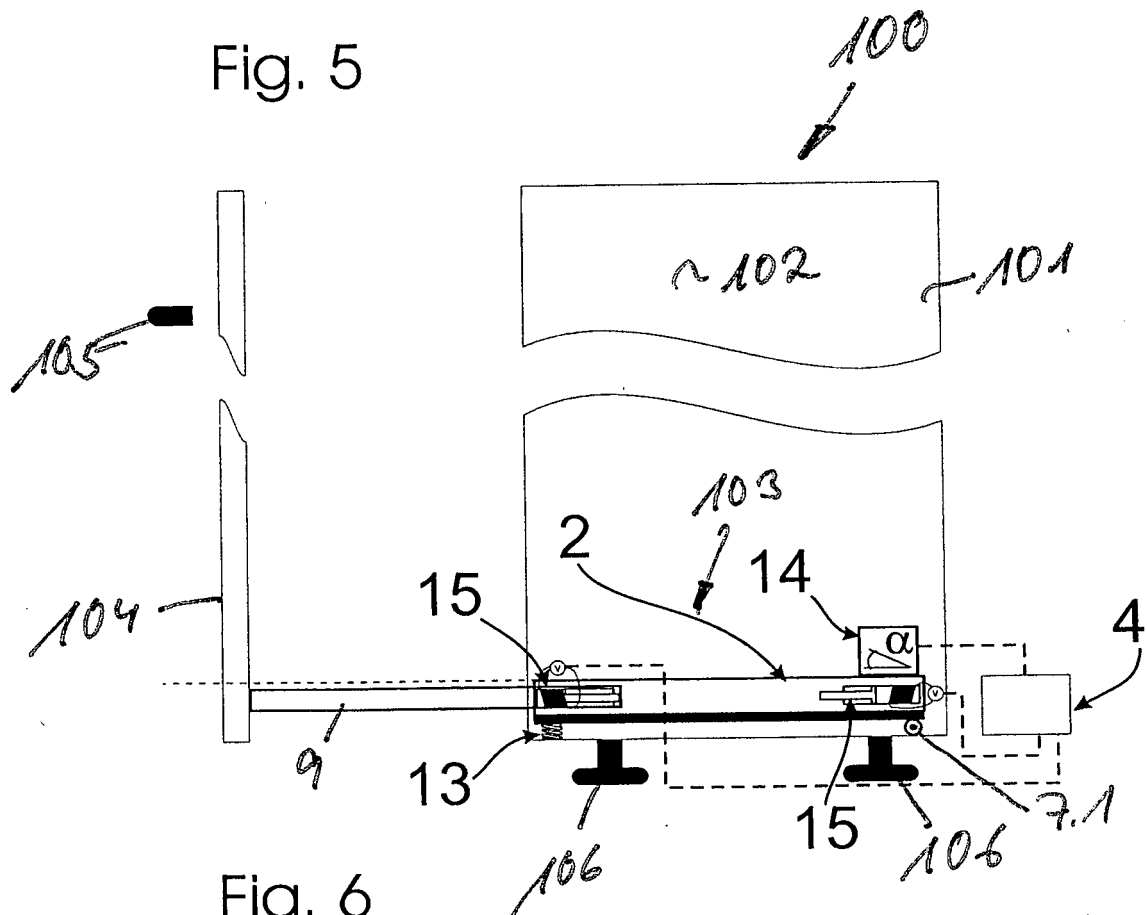


Fig. 6

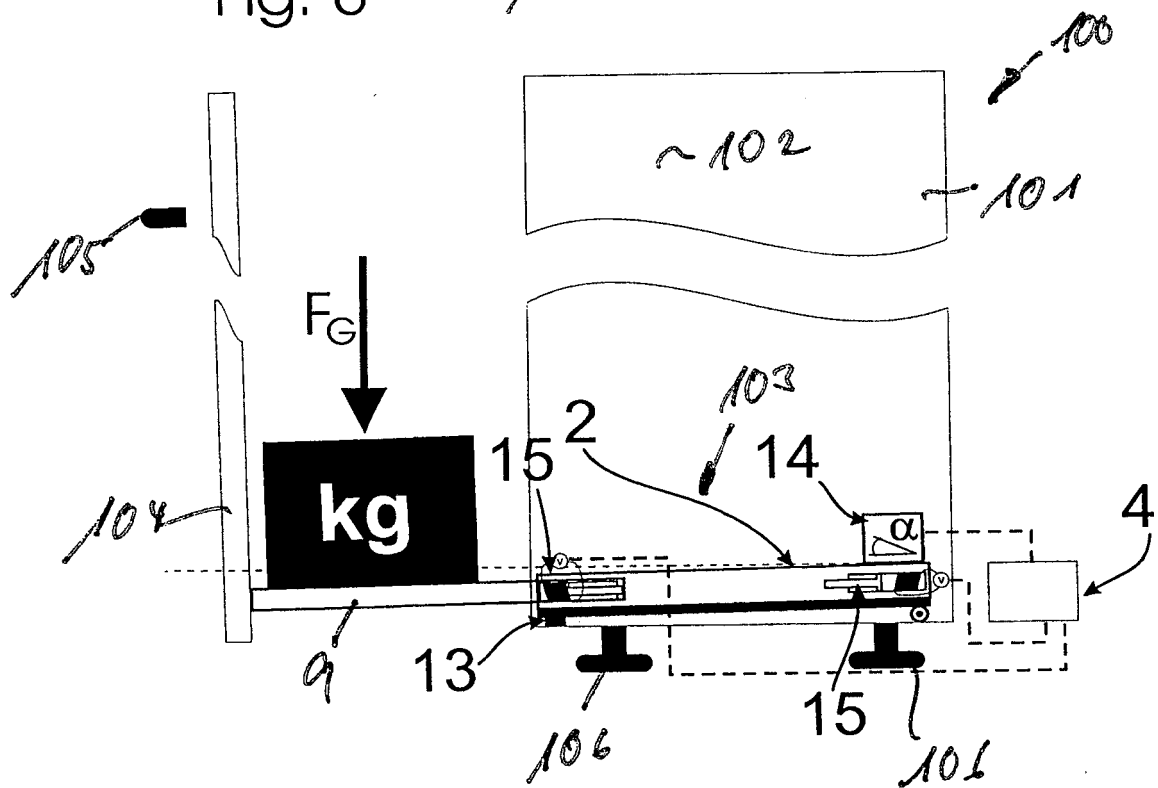


Fig. 7

