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(54) **Bezeichnung** : SCHWENKBESCHLAG

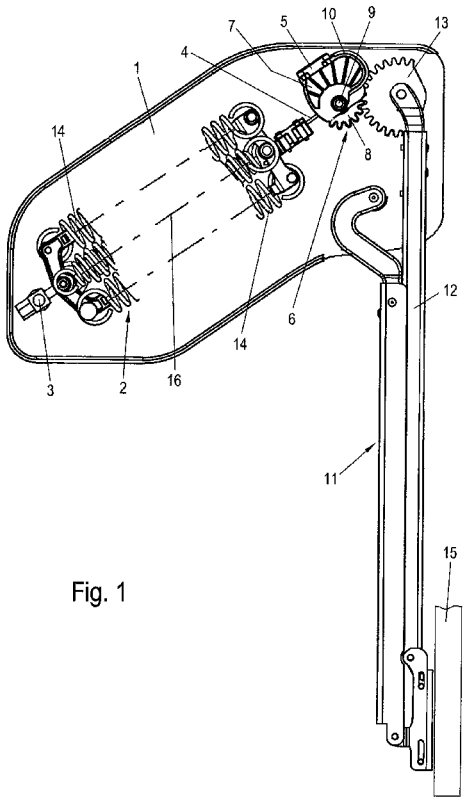

Fig. 1

(57) **Abstract**: A pivoting fitting for pivoting a flap (15) hinged on a furniture body, comprising an energy accumulator (2) fastened to a connecting part which can be connected to a body wall, and a lever arrangement (11) which is operatively connected to the energy accumulator (2) and has at least one articulated lever (12), is configured such that the energy accumulator (2) is connected to a control element (6) comprising a cam disc (7) which is fixed but rotatable with respect to the connecting part, which control element is connected in a movement-dependent manner to the articulated lever (12) which is held on the one side on the connecting part and can be held on the other side on the flap (15), and is rotated when the articulated lever (12) is pivoted, wherein in one pivoted end position, the energy accumulator (2) is clamped, and in the other end position is unclamped relative thereto, and wherein the cam disc (7) has a control contour (10) with varying radius of curvature, on which cam disc (7) the energy accumulator (2) is held.

(57) **Zusammenfassung**: Ein Schwenkbeschlag zum Verschwenken einer an einem Möbelkorpus angelenkten Klappe (15), mit einem an einer Korpuswand anschließbaren Anschlussteil befestigten Kraftspeicher (2) und einer an der Klappe (15) anschließbaren, mit dem Kraftspeicher (2) in Wirkverbindung stehenden, zumindest einen Gelenkhebel (12) aufweisenden Hebelanordnung (11), ist so ausgebildet, dass der Kraftspeicher (2) mit einem gegenüber dem Anschlussteil ortsfesten, jedoch verdrehbaren, eine Kurvenscheibe

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WO 2016/131780 A1

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— *mit internationalem Recherchenbericht (Artikel 21 Absatz 3)*

(7) aufweisenden Steuerelement (6) verbunden ist, das bewegungsabhängig mit dem einerseits am Anschlussteil gehaltenen und andererseits an der Klappe (15) halterbaren Gelenkhebel (12) in Verbindung steht und bei Verschwenken des Gelenkhebels (12) verdreht wird, wobei in einer verschwenkten Endstellung der Kraftspeicher (2) gespannt und in der anderen Endstellung relativ dazu entspannt ist und wobei die Kurvenscheibe (7) eine Steuerkontur (10) mit variierendem Krümmungsradius aufweist, an der der Kraftspeicher (2) gehalten ist.

Pivoting fitting

The invention relates to a pivoting fitting for pivoting a flap, which is hinged on a furniture body.

Such pivoting fittings are used in order to automatically keep the flap pivoted about a horizontal axis in the open position on the one hand and to secure it in a closed position on the other hand, for which purpose it is pulled against the associated edges of the furniture body by the force of the energy accumulator, usually a tension spring.

Such a pivoting fitting is discussed in DE 296 05 551 U1. In this case, an energy accumulator formed as a tension spring engages on a lever arrangement, which is fastened on the one hand to a body wall and on the other hand to the flap, wherein the tension spring holds the flap both in an unfolded position and also pulls it in a closed position to the furniture body.

However, it is a problem in this case that, during pivoting of the flap, the flap must be guided manually in order to hold it against the force of the tension spring, by which the flap is otherwise always pulled into a closed position, except for the open position in which, as mentioned, the flap is held by the tension spring.

The handling during the pivoting of the flap is also problematic in that it is pulled in an almost unbraked manner to its closed position, so that it is pressed against the furniture body with a largely undiminished tensile force.

In order to provide a remedy, the use of a damping device has been proposed in DE 20 2005 016 375, with which the closing process or the striking of the flap on the furniture body is dampened.

Irrespective of the fact that the holding problem is not solved during pivoting, the known pivoting fittings can only be implemented with a large number of components, in particular with regard to necessary lever kinematics, which not only leads to considerable production costs but also makes mounting of the respective pivoting fitting more difficult.

A different design is also to be considered disadvantageous, in particular also with regard to sufficient service life, with which, as it were, a forced guidance of the flap is to be achieved and in which a cam is used in correspondence with a control cam, wherein the cam is spring-loaded.

2016221792 26 Jun 2020

Due to the necessarily high spring forces, the components involved in the movement sequence are subject to relatively high friction and high surface pressure, which can lead to damage to the control contour of the cam or to a roller guided thereon. This is obviously unacceptable, especially since the pivoting fitting is then impaired in its function and must be replaced at worst.

It is the aim of the invention to further develop a pivoting fitting of the generic type in such a way that its functional capability, i.e. the operating convenience when pivoting the flap, is improved, in embodiments the service life may be extended and the number of necessary components may be reduced in order to reduce the production costs. In addition, in embodiments, the system friction may be significantly reduced, so that low spring forces are necessary for an identically designed flap.

In a first aspect there is provided a pivoting fitting for pivoting a flap hinged on a furniture body, comprising an energy accumulator fastened to a connecting part which can be connected to a body wall and a lever arrangement which can be connected to the flap , is operatively connected to the energy accumulator and comprises at least one articulated lever, whereby the energy accumulator is connected to a control element which is fixed but rotatable relative to the connecting part and has a cam disk, which control element is connected in a movement-dependent manner to the articulated lever which is held on the one hand on the connecting part and is fixed on the other hand on the flap, and is rotated when the articulated lever is pivoted, wherein in one pivoted end position the energy accumulator is tensioned and in the other end position is relaxed relative thereto, and wherein the cam disk has a control contour with a varying radius of curvature, on which the energy accumulator is held characterized in that the control element is part of a gear which is in engagement with the lever arrangement and that the energy accumulator is fastened to the cam disk by means of a flexible traction means which is formed as a belt, chain, toothed belt, cable or the like, whereby the traction means rests against a control contour of the cam disk.

In an embodiment, the control element has a pinion which is rotationally fixed relative to the cam disk and is in engagement with the lever arrangement as a component of a gear. In an embodiment, the pinion meshes with a gearwheel segment fastened in a rotationally fixed manner to the articulated lever. In an embodiment, the pinion and/or the cam disk are rotatably mounted on a pivot pin clamped on one side. In an embodiment, the energy accumulator is pivotably mounted as a connecting part in a housing that can be fixedly connected to the body

2016221792 26 Jun 2020

wall. In an embodiment, the control contour is formed in such a way that the direction of the torque generated by the energy accumulator on the control element in the closed position of the flap is reverse to the open position of the flap. In an embodiment, the control contour is formed in such a way that the flap is held in equilibrium in at least one position between the fully open and fully closed position. In an embodiment, the traction means extends in one pivoted end position of the articulated lever on one side of the axis of the pivot pin and in another pivoted end position on the other side of the pivot pin. In an embodiment, the lever arrangement is formed as a four-bar chain. In an embodiment, the energy accumulator comprises at least one tension spring. In an embodiment, the course of the control contour is formed in such a way that the flap is positioned without support in each pivoting position.

In embodiments, the new pivoting fitting is initially characterized in that it functionally makes do with relatively few components, i.e. with significantly fewer components than with a pivoting fitting according to the prior art. This may result in low production costs, both as a result of economical use of materials as well as by shorter production times, which is important in so far as such pivoting fittings are used as serial articles in large quantities.

In embodiments, the lever arrangement is formed by a four-bar chain known per se, the movement of which is supported by the control element in correspondence with the energy accumulator. In principle, however, all other lever arrangements can also be supported with the system.

In this case, the force of the energy accumulator, preferably a tension spring or a tension spring block, is applied by the control element to the lever arrangement, i.e. the articulated lever, in such a way that the flap remains automatically in a predetermined range of the pivoted position, i.e. it remains in equilibrium. In a pivoting range before the fully closed position or in a pivoting range of the fully open position, the flap can close or open automatically.

The control element has a rotatable cam disk, having a control contour, on which a flexible traction means rests, said flexible traction means being attached to the cam disk and forming an extension of the energy accumulator.

In this case, in advantageous embodiments, the connection of the traction means, which may otherwise consist of a belt, a chain, a toothed belt, a cable or the like, can take place on the cam disk in such a way that the force direction of the energy accumulator in the closed position of the

26 Jun 2020 20162221792

flap, relative to the pivoting direction, is positioned above the axis of a pivot pin carrying the control element and below in the open position, as a result of which the respective different rotational directions of the control element are supported.

This arrangement may ensure that the pivoting movement is assisted when the flap is pivoted, just before reaching the respective end position.

According to a further embodiment of the invention, the control element has, in addition to the cam disk, at least one further gear part which is formed here as a pinion which is held in a rotationally fixed manner relative to the cam disk. This pinion cooperates with further gear elements, preferably with a toothed wheel segment which is fixedly connected to the articulated lever. In this case, the pinion and the cam disk can be pivoted about a common axis of rotation, which is formed by a pivot pin held on one side. Two opposing pivot pins are preferably provided, the axes of rotation of which are aligned and which are disposed at a distance from one another on the front side, wherein the pinion is mounted on one pivot pin and the cam disk on the other.

As mentioned, the new pivoting fitting may, in embodiments, ensure that the flap remains support-free in each pivoting position. For this purpose, the radius of curvature of a control cam of the cam disk may vary in the course of the curve, which may be adjusted to the torques which change depending on the pivoting position of the flap and act on the cam disk or the energy accumulator. In this case, the torque which is different in each pivoting position of the flap is essentially determined by the weight of the flap and the changing lever arm, resulting from the varying distance of the control contour from the axis of rotation of the control element.

An exemplary embodiment of the invention is described below with reference to the attached drawings, wherein:

Figs. 1 and 2 show a pivoting fitting according to an embodiment of the invention in different positions in respective side views.

A pivoting fitting for pivoting a flap 15, which is hinged on a furniture body (not shown), is shown in the drawings, wherein a part of the functional parts of the pivoting fitting is arranged in a housing, which forms a connecting part, on a body wall of the furniture body, and of which a housing part 1 is shown.

2016221792 26 Jun 2020

By omitting the body wall, on which the housing is fastened, and a further housing part, the drawings virtually provide a view from the outside into the furniture body and the housing, wherein a pivot pin 9 is arranged to be fixed on one side to the housing part (not shown).

An energy accumulator 2 is held in the housing so as to be pivotable about a pivot axis 3 and thus fixed in a stationary manner, i.e. indirectly, to the body wall (not shown).

Said energy accumulator 2 consists in this example of a spring block with three tension springs 14 arranged parallel to one another and is connected to a control element 6 via a centrally connected traction means 4, wherein the traction means 4 forms the extension of an effective axis 16 of the energy accumulator 2. Instead of the tension springs 14, other suitable energy accumulators can also be used, e.g. a compression spring with deflection, torsion springs, roller springs or the like.

The control element 6 is rotatable but also stationary relative to the housing and is connected, in a manner dependent on the movement, to an articulated lever 12 of a lever arrangement 11, wherein the lever arrangement 11 is formed as a four-bar chain and the articulated lever 12 is held on the flap 15 on the one hand and pivotably in the housing on the other hand.

The control element 6 has a cam disk 7 as well as a pinion 8, which are mounted on the pivot pin 9 in a rotationally fixed manner with respect to each other.

The traction means 4 rests on a control contour 10 of the cam disk 7 and is fastened thereto by means of a connecting element 5.

The pinion 8, in turn, engages in the teeth of a gearwheel segment 13, which is connected in a rotationally fixed manner to the articulated lever 12, specifically in the region of its pivot axis in the housing.

Fig. 1 shows a closed position of the flap 15. During its pivoting in the direction of an open position shown in Fig. 2, in which the flap 15 is displaced in parallel, the articulated lever 12 is twisted, as also the control element 6, in the pinion 8 of which the teeth of the gearwheel segment 13 engage. The energy accumulator 2 is in the closed position, i.e. the tension springs 14 are tensioned.

26 Jun 2020 2016221792

In this case, the traction means 4, which is fastened to the cam disk 7 via a connecting element 5, is located above the axis of the pivot pin 9, as seen in the pivoting direction of the articulated lever 12, so that the pinion 8 is loaded in the counterclockwise direction, by means of which the gearwheel segment 13 is rotated clockwise during closure of the flap 15 and pressed against the furniture body.

When the flap 15 is pivoted in the upward direction, the control element 6 is rotated in the opposite direction, i.e. clockwise. As a result of the tensile force of the energy accumulator 2 and the geometry of the cam disk, i.e. as a result of the course of the control contour 10, and with a change in the distance from the axis of the pivot pin 9, the speed of the travelled path of the energy accumulator changes with constant angular speed of the lever arrangement 11.

In each position of the lever arrangement 11 or of the flap 15, the varying torque, resulting from the tensile force of the energy accumulator 2 and the distance of the control contour 10 from the pivot pin 9, therefore ensures the support-free holding of the flap 15.

As can be seen particularly clearly in Fig. 2, the traction means 4 now lies against the pivot pin 9 on the side of the cam disk 7 which is the lower one in the pivoting direction, i.e. opposite the position in the closed position of the flap 15.

It can be clearly seen that, in the closed position of the flap 15 (Fig. 1), the energy accumulator 2 is tensioned while it is relatively relaxed in the opening position of the flap 15 (Fig. 2). At the same time, the effective axis 16 is changed in its position relative to the axis of rotation of the pivot pin 9.

As a result of the one-sided holding of the pivot pin 9 in the sense of a lifting lug, the traction means 4 can be guided without hindrance into the respective end position by twisting the cam disk 7.

In this specification, unless the context clearly indicates otherwise, the term “comprising” has the non-exclusive meaning of the word, in the sense of “including at least” rather than the exclusive meaning in the sense of “consisting only of”. The same applies with corresponding grammatical changes to other forms of the word such as “comprise”, “comprises” and so on.

2016221792 26 Jun 2020

Any discussion of prior art information in this specification is not to be taken as any form of acknowledgement that that prior art information would be considered common general knowledge by a person of skill in the art, either in Australia or in any foreign country.

Any promises made in the present description should be understood to relate to some embodiments of the invention, and are not intended to be promises made about the invention. Where there are promises that are deemed to apply to all embodiments of the invention, the right is reserved to later delete those promises from the description since there is no intention to rely on those promises for the acceptance or subsequent grant of a patent unless the context makes clear otherwise.

26 Jun 2020 20162221792

List of reference numerals

1	Housing part
2	Energy accumulator
3	Pivot axis
4	Traction means
5	Connecting element
6	Control element
7	Cam disk
8	Pinion
9	Pivot pin
10	Control contour
11	Lever arrangement
12	Articulated lever
13	Gearwheel segment
14	Tension spring
15	Flap
16	Effective axis

2016221792 26 Jun 2020

CLAIMS:

1. A pivoting fitting for pivoting a flap hinged on a furniture body, comprising

an energy accumulator fastened to a connecting part which can be connected to a body wall, and

a lever arrangement which can be connected to the flap operatively connected to the energy accumulator and comprising at least one articulated lever,

whereby the energy accumulator is connected to a control element which is fixed but rotatable relative to the connecting part and has a cam disk, which control element is connected in a movement-dependent manner to the articulated lever which is held on the one hand on the connecting part and is fixed on the other hand on the flap, and is rotated when the articulated lever is pivoted, wherein in one pivoted end position the energy accumulator is tensioned and in the other end position is relaxed relative thereto, and wherein the cam disk has a control contour with a varying radius of curvature, on which the energy accumulator is held

characterized in that the control element is part of a gear which is in engagement with the lever arrangement and that the energy accumulator is fastened to the cam disk by a flexible traction means which is formed as a belt, chain, toothed belt, cable or the like, whereby the traction means rests against a control contour of the cam disk.

2. A pivoting fitting according to claim 1, **characterized in that** the control element has a pinion which is rotationally fixed relative to the cam disk and is in engagement with the lever arrangement as a component of a gear.

3. A pivoting fitting according to one of the preceding claims, **characterized in that** the pinion meshes with a gearwheel segment fastened in a rotationally fixed manner to the articulated lever.

4. A pivoting fitting according to one of the preceding claims, **characterized in that** the pinion and/or the cam disk are rotatably mounted on a pivot pin clamped on one side.

5. A pivoting fitting according to one of the preceding claims, **characterized in that** the energy accumulator is pivotably mounted as a connecting part in a housing that can be

20162221792 26 Jun 2020

fixedly connected to the body wall.

6. A pivoting fitting according to one of the preceding claims, **characterized in that** the control contour is formed in such a way that the direction of the torque generated by the energy accumulator on the control element in the closed position of the flap is reverse to the open position of the flap.

7. A pivoting fitting according to one of the preceding claims, **characterized in that** the control contour is formed in such a way that the flap is held in equilibrium in at least one position between the fully open and fully closed position.

8. A pivoting fitting according to one of the preceding claims, **characterized in that** the traction means extends in one pivoted end position of the articulated lever on one side of the axis of the pivot pin and in another pivoted end position on the other side of the pivot pin.

9. A pivoting fitting according to one of the preceding claims, **characterized in that** the lever arrangement is formed as a four-bar chain.

10. A pivoting fitting according to one of the preceding claims, **characterized in that** the energy accumulator comprises at least one tension spring.

11. A pivoting fitting according to one of the preceding claims, **characterized in that** the course of the control contour is formed in such a way that the flap is positioned without support in each pivoting position.

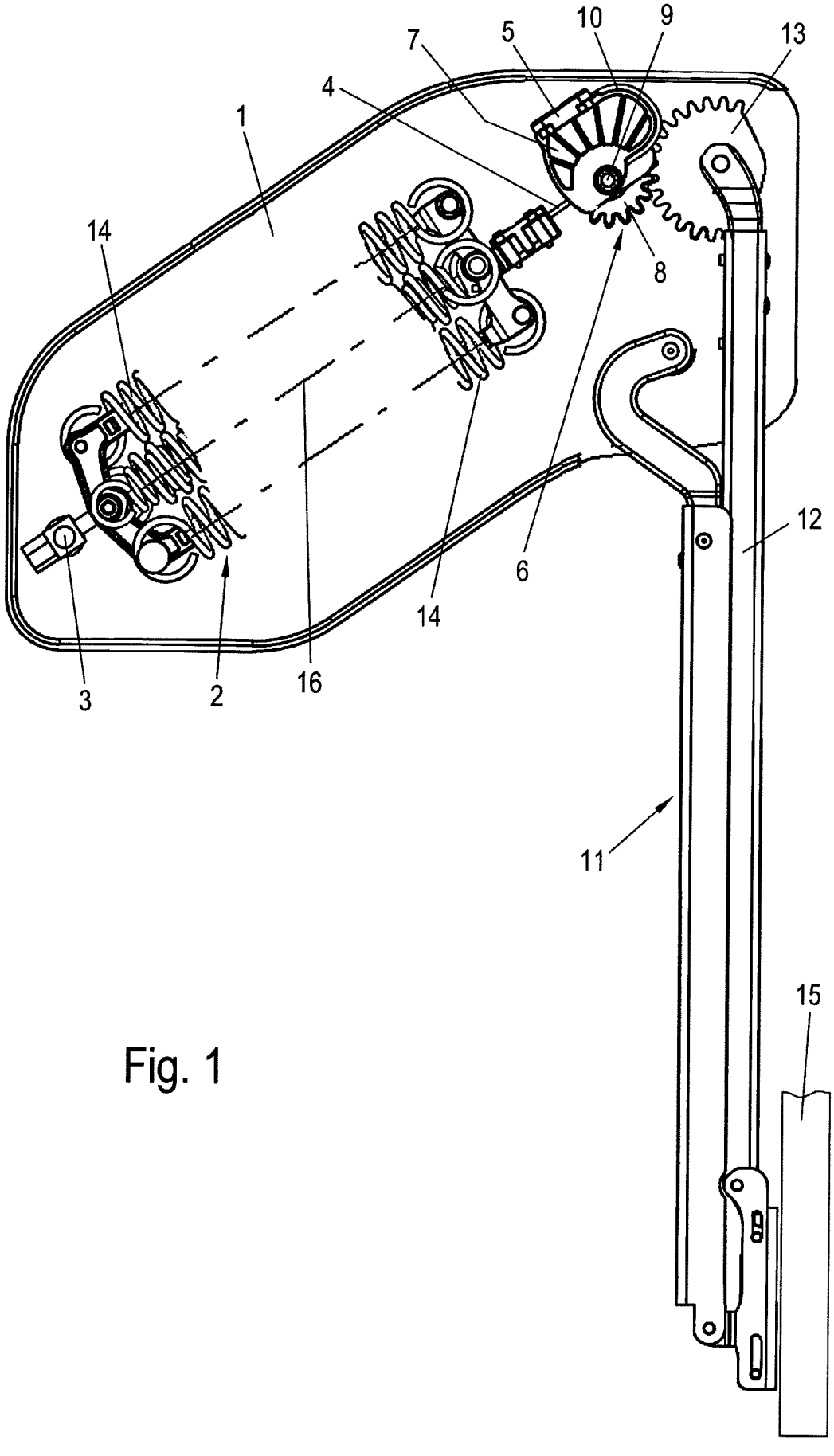

Fig. 1

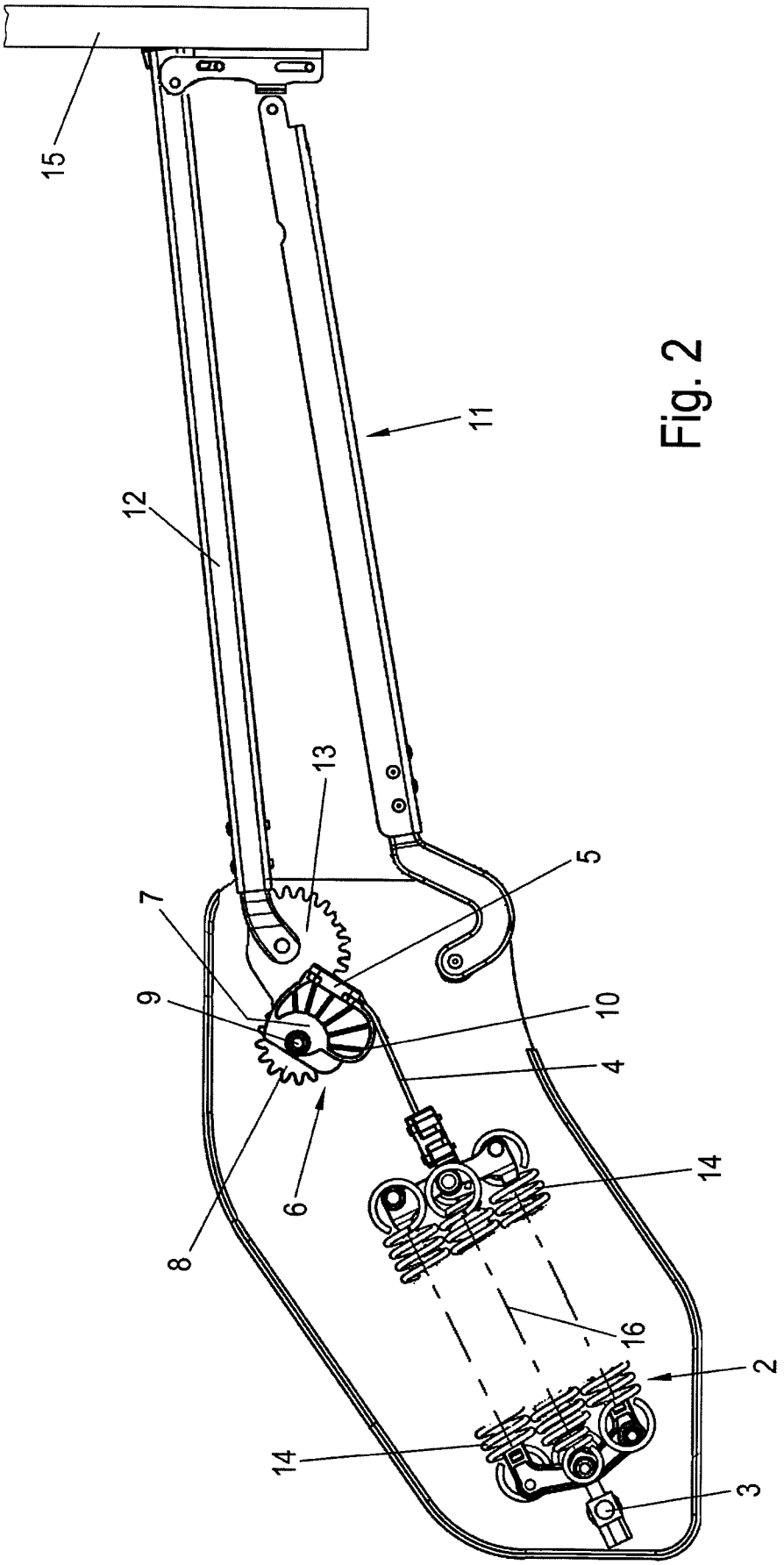

Fig. 2