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(54) **Elastic force adjustment device for slide assembly**

Einstellungsvorrichtung mit elastischer Spannung für eine Schiebeanordnung

Dispositif d'ajustement de force élastique pour ensemble coulissant

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- **Chen, Ken-Ching**
Lu-Chu Hsiang (TW)
- **Wang, Chun-Chiang**
Lu-Chu Hsiang (TW)

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(74) Representative: **Viering, Jentschura & Partner mbB**
Patent- und Rechtsanwälte
Grillparzerstrasse 14
81675 München (DE)

(73) Proprietor: **King Slide Works Co., Ltd.**
Kaohsiung Hsien (TW)

(72) Inventors:
• **Liang, Hsiu-Chiang**
Lu-Chu Hsiang (TW)

(56) References cited:
DE-U1-202004 000 840 US-B1- 7 374 261

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Description**FIELD OF THE INVENTION**

[0001] The present invention relates to an elastic force adjustment device, and more particularly, to an elastic force adjustment device for adjusting the elastic force to control the distance that the rails travel in response to the load of the rails.

BACKGROUND OF THE INVENTION

[0002] U.S. Patent No. 7,374,261 discloses a push-open type slide structure comprises a top fastener and a locking device between an outer slide rail and a pull rod. The loading plate is extended from one side of the center portion of the main body. Two pillars are extended from both sides of the main body. A positioning fastener is coupled with the loading plate. A hook is mounted on the inner edge of the loading plate. A guide pillar is mounted on the rear end of the loading plate. The hook is inserted into the action trench of the main body and coupled with the elastic device. The locking device has a connection part for coupling with a guide part and a shaft holder. The push-open type slide structure is lockable or unlockable by pivotal rotation between the loading plate and the locking device. As a result, the push-open type slide structure can be controlled easily.

[0003] The push-open type slide structure is operated by the stored force of the elastic device and the specification of the elastic device is chosen so as to have a fixed elastic force. When in use, the slide assembly is connected between the furniture part and the drawer so that when the drawer is pushed inward, the drawer opens automatically from the furniture part. However, when the drawer has different loads, especially heavy objects, the load on the drawer applied to the rails cannot make the drawer to be opened to a desired position. Furthermore, when the furniture include multiple drawers and different loads are received in the drawers, the drawers open to different positions which may be confused to the users.

[0004] An elastic force adjustment device of the initially-mentioned type is already known from DE 20 2004 000 840 U1.

[0005] The inventor develops an elastic force adjustment device for the push-open type slide assembly so as to improve the shortcomings of the conventional push-open type slide assembly.

SUMMARY OF THE INVENTION

[0006] The present invention intends to provide an elastic force adjustment device for the push-open type slide assembly, the adjustment device adjusts the stored elastic force to adjust the travel distance of the rails. The invention provides an elastic force adjustment device according to claim 1. Further embodiments of the invention are described in the dependent claims.

[0007] The fixing member has a stop located between the first and second ends thereof. The movable member is movable between the second end of the fixing member and the stop.

[0008] A buffering coat is mounted to the stop.

[0009] The second rail includes a push member located corresponding to the movable member.

[0010] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

Figs. 1-6 do not form embodiments of the invention as such, but help explaining aspects of the invention.

Fig. 1 is a perspective view to show the elastic force adjustment device is installed to the slide assembly; Fig. 2 is an exploded view to show the elastic force adjustment device;

Fig. 3 shows that the adjustment frame of the elastic force adjustment device is located at the first position;

Fig. 4 shows that the adjustment frame of the elastic force adjustment device is adjusted and located at the second position;

Fig. 5 shows that the fixing member includes a stop; Fig. 6 shows that the stop is mounted by a buffering coat, and

Fig. 7 shows the position of the movable member when the elastic member is in compressed status.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] Referring to Figs. 1 and 2, the slide assembly comprises a first rail 12 and a second rail 14 which is slidably and longitudinally connected to the first rail 12. An elastic force adjustment device 16 of the present invention is installed to the first rail 12 so as to provide an adjustable and elastic force to the second rail 14 which is opened relative to the first rail 12.

[0013] The first rail 12 includes a bottom board 18 and a sidewall 20 which extends perpendicularly from the bottom board 18.

[0014] The second rail 14 includes a push member 22.

[0015] The elastic force adjustment device 16 comprises a fixing member 24, a movable member 26, an adjustment frame 28, an adjustment member 30 and at least one elastic member 32, wherein the fixing member 24 is fixedly connected to the first rail 12 and includes a threaded rod 34 and a longitudinal body 36. The longitudinal body 36 has a first end 35a and a second end 35b which is located in opposite to the first end 35a. A longitudinal guiding portion 38 is located between the first and second

ends 35a, 35b.

[0016] The movable member 26 is slidably connected to the longitudinal guiding portion 38 of the fixing member 24 and movable along the longitudinal guiding portion 38. The movable member 26 includes a contact portion 40 which is located corresponding to the push member 22 of the second rail 14 so that the movable member 26 is moved with the movement of the push member 22 of the second rail 14 by the contact portion 40.

[0017] The adjustment frame 28 has a mounting portion 42 connected to the threaded rod 34 of the fixing member 24.

[0018] The adjustment member 30 has a threaded portion 44 threadedly connected to the threaded rod 34 of the fixing member 24.

[0019] The at least one elastic member 32 (or two elastic members 32) has two ends which are respectively connected to the movable member 26 and the adjustment frame 28.

[0020] Fig. 3 shows the second rail 14 is retracted relative to the first rail 12 and the push member 22 on the second rail 14 contacts the contact portion 40 of the movable member 26 of the elastic force adjustment device 16. The movable member 26 moves a pre-set distance along the longitudinal guiding portion 38 of the fixing member 24, so that the at least one elastic member 32 of the adjustment frame 28 and the movable member 26 are pulled so as to store an elastic force relative to the second rail 14. In this status, an engaging device (not shown) is connected between the first and second rails 12, 14 to position the second rail 14, relative to the retracted first rail 12 by the engaging device. In other words, the movable member 26 applied by the at least one elastic member 32 cannot push the second rail 14 via the push member 22. The adjustment frame 28 is moved by the adjustment member 30 and is set at the first position P1 on the threaded rod 34 of the fixing member 24.

[0021] Fig. 4 shows that the adjustment member 30 of the elastic force adjustment device 16 is rotated on the threaded rod 34 of the fixing member 24 to contact and move the adjustment frame 28 from the first position P1 on the threaded rod 34 of the fixing member 24 to the second position P2, and the adjustment frame 28 is positioned at the second position P2. In this status, the relative distance between the movable member 26 and the adjustment frame 28 is adjusted, and the status of the at least one elastic member 32 of the adjustment frame 28 and the movable member 26 are adjusted. This is to say, the stored elastic force is adjusted.

[0022] Therefore, when the second rail 14 is retracted relative to the first rail 12 to extend the at least one elastic member 32 by the contact of the push member 22 and the contact portion 40 of the movable member 26, the movable member 26 applies the stored elastic force to the second rail 14, wherein the stored elastic force is formed according to the extension of the at least one elastic member 32. The elastic force from the at least one elastic member 32 is released and then applies to

the contact portion 40 of the movable member 26 and moves the push member 22 of the second rail 14 so that the second rail 14 is opened to a desired position relative to the first rail 12.

[0023] Furthermore, as shown in Fig. 5, considering that the movable member 26 is pulled by the at least one elastic member 32 and moves along the longitudinal guiding portion 38 of the fixing member 24. The fixing member 24 has a stop 46 located between the first and second ends 35a, 35b thereof. In this embodiment, the stop 46 is located close to the first end 35a, and the movable member 26 is movable between the second end 35b of the fixing member 24 and the stop 46. As shown in Fig. 6, a buffering coat 48 is mounted to the stop 46 so as to reduce the noise when the movable member 26 contacts the stop 46.

[0024] In another situation, as shown in Fig. 7, the stop position of the movable member 26 applied by the elastic force of the at least one elastic member 32 can be controlled by the compressed length of the at least one elastic member 32. The adjustment member 30 and the adjustment frame 28 are adjusted to a third position on the threaded rod 34 of the fixing member 24. The third position allows the movable member 26 not to contact the first end 35a of the longitudinal guiding portion 38 of the fixing member 24 or the stop 46. The adjustment frame 28 further includes an urging member 50 wherein the adjustment member 30 is located and in contact between the urging member 50 and the mounting portion 42. By this arrangement, the adjustment member 30 and the adjustment frame 28 are moved back and forth together.

[0025] The elastic force adjustment device for slide assembly allows the users to adjust the elastic force as needed. Especially when drawers are installed to the slide assembly and different weights of objects are received in the drawers, by the adjustment of the elastic force, the elastic force of each drawer can be properly adjusted so that the drawers can be opened to a desired position for convenience of accessing the objects in the drawers when the drawers are operated under the push-open mode.

[0026] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

Claims

1. A slide assembly comprising an elastic force adjustment device, wherein the slide assembly includes a first rail (12) and a second rail (14) slidably connected to the first rail (12), the elastic force adjustment device comprising:

a fixing member (24) adapted to be fixedly connected to the first rail (12) and including a lon-

itudinal body (36), the longitudinal body (36) having a first end (35a) and a second end (35b) which is located in opposite to the first end (35a), a longitudinal guiding portion (38) located between the first and second ends (35a, 35b);

characterised by:

the fixing member (24) including a threaded rod (34);
 a movable member (26) slidably connected to the longitudinal guiding portion (38) of the fixing member (24);
 an adjustment frame (28) having a mounting portion (42) connected to the threaded rod (34) of the fixing member (24) and including an urging member (50);
 an adjustment member (30) having a threaded portion (44) threadedly connected to the threaded rod (34) of the fixing member (24), the adjustment member (30) is located and in contact between the urging member (50) and the mounting portion (42), and
 at least one elastic member (32) having two ends which are respectively connected to the movable member (26) and the adjustment frame (28), a force of Claim proposal for main request the at least one elastic member (32) being adjusted by rotating the adjustment member (30) on the threaded rod (34) of the fixing member (24).

2. The device as claimed in claim 1, wherein the fixing member (24) has a stop (46) located between the first and second ends (35a, 35b) thereof, the movable member (26) is movable between the second end (35b) of the fixing member (24) and the stop (46).
3. The device as claimed in claim 2, further comprising a buffering coat (48) mounted to the stop (46).
4. The device as claimed in claim 1, wherein the second rail (14) includes a push member (22) located corresponding to the movable member (26).

Patentansprüche

1. Ein Schlitten mit einer Vorrichtung zur Verstellung der Spannkraft, wobei der Schlitten aus einer ersten Schiene (12) und aus einer zweiten Schiene (14) besteht; die zweite Schiene (14) gleitbar an der ersten Schiene (12) befestigt ist und die Vorrichtung zur Verstellung der Spannkraft aus den folgenden Komponenten umfassend:

einem Befestigungsteil (24), das fest an der ersten Schiene (12) befestigt und mit einem läng-

lichen Bauteil (36) gebildet ist; das längliche Bauteil (36) mit einem ersten Endteil (35a) und einem zweiten Endteil (35b) gegenüber dem ersten Endteil (35a) gebildet ist; ein längliches Führungsteil (38) zwischen dem ersten und zweiten Endteil (35a, 35b) gebildet ist

dadurch gekennzeichnet, dass:

das Befestigungsteil (24) eine Gewindestange (34) aufweist
 ein bewegliches Element (26) gleitbar am länglichen Führungsteil (38) des Befestigungsteils (24) befestigt ist
 eine Verstelleinheit (28) mit einem Montageteil (42), das an der Gewindestange (34) des Befestigungsteils (24) befestigt und mit einem Andrückteil (50) gebildet ist;
 ein Verstellrad (30) mit einem Gewinde (44), in das die Gewindestange (34) des Befestigungsteils (24) eingeschraubt ist; das Verstellrad (30) zwischen dem Andrückteil (50) und dem Montageteil (42) angeordnet ist und mit diesen in Berührung kommt; mindestens eine Feder (32) zwei Enden aufweist, wobei eines dieser beiden Ende am beweglichen Element (26) und das andere an der Verstelleinheit (28) befestigt sind; eine Kraft durch die mindestens eine Feder (32) durch Rotieren des Verstellrades (30) an der Gewindestange (34) des Befestigungsteils (24) justiert wird.

2. Die Vorrichtung nach Anspruch 1, wobei das Befestigungsteil (24) mit einem Anschlag (46) zwischen dem ersten und zweiten Endteil (35a, 35b) gebildet ist; das bewegliche Element (26) zwischen dem zweiten Ende (35b) des Befestigungsteils (24) und dem Anschlag (46) beweglich angeordnet ist.
3. Die Vorrichtung nach Anspruch 2, weiter bestehend aus einem Pufferbelag (48), der am Anschlag (46) montiert ist.
4. Die Vorrichtung nach Anspruch 1, wobei die zweite Schiene (14) mit einem Anschubteil (22) gebildet ist, das in Übereinstimmung mit dem beweglichen Element (26) angeordnet ist.

Revendications

1. Un ensemble coulissant comprenant un dispositif de réglage de force élastique, dans lequel l'ensemble coulissant inclut un premier rail (12) et un deuxième rail (14) raccordé de façon coulissante au premier rail (12), le dispositif de réglage de force élastique comprenant :

un élément de fixation (24) adapté pour être raccordé de façon fixe au premier rail (12) et incluant un corps longitudinal (36), le corps longitudinal (36) présentant une première extrémité (35a) et une deuxième extrémité (35b) qui est située à l'opposé de la première extrémité (35a), une partie de guidage longitudinale (38) située entre les première et deuxième extrémités (35a, 35b)

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caractérisé par :

l'élément de fixation (24) inclut une tige filetée (34)
 un élément mobile (26) raccordé de façon coulissante à la partie de guidage longitudinale (38) de l'élément de fixation (24)
 une structure de réglage (28) présentant une partie d'assemblage (42) raccordée à la tige filetée (34) de l'élément de fixation (24) et incluant un élément de poussée (50) ;
 un élément de réglage (30) présentant une partie filetée (44) raccordée par filetage à la tige filetée (34) de l'élément de fixation (24) ; l'élément de réglage (30) est situé et en contact entre l'élément de poussée (50) et la partie d'assemblage (42), et au moins un élément élastique (32) présentant deux extrémités qui sont respectivement raccordées à l'élément mobile (26) et à la structure de réglage (28), une force d'au moins un élément élastique (32) étant réglée par la rotation de l'élément de réglage (30) sur la tige filetée (34) de l'élément de fixation (24).

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2. Le dispositif selon la revendication 1, dans lequel l'élément de fixation (24) présente un arrêt (46) situé entre les première et deuxième extrémités (35a, 35b) de celui-ci, l'élément mobile (26) est mobile entre la deuxième extrémité (35b) de l'élément de fixation (24) et l'arrêt (46).

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3. Le dispositif selon la revendication 2, comprenant en outre un revêtement tampon (48) assemblé sur l'arrêt (46).

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4. Le dispositif selon la revendication 1, dans lequel le deuxième rail (14) inclut un élément poussoir (22) situé en correspondance avec l'élément mobile (26).

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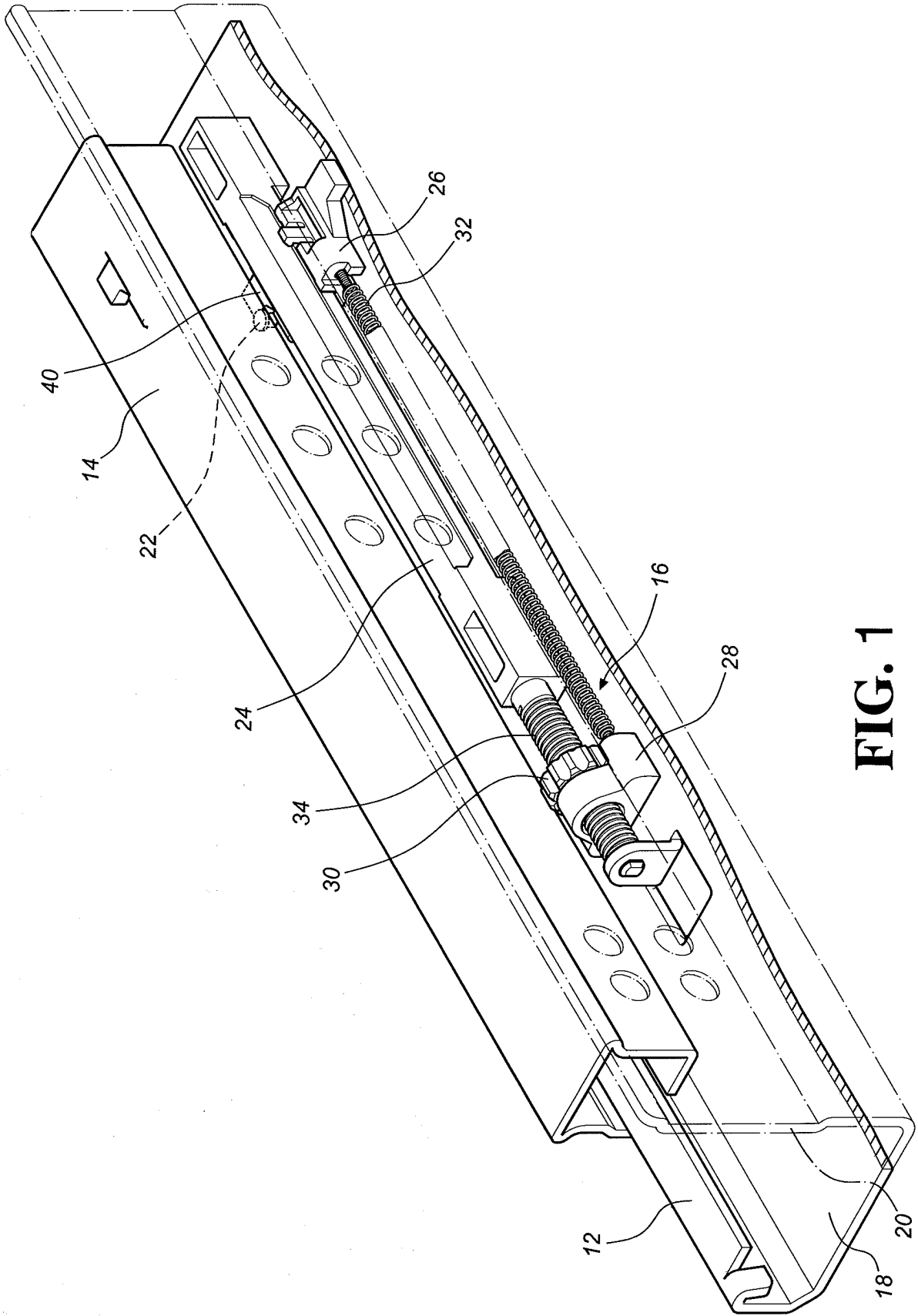


FIG. 1

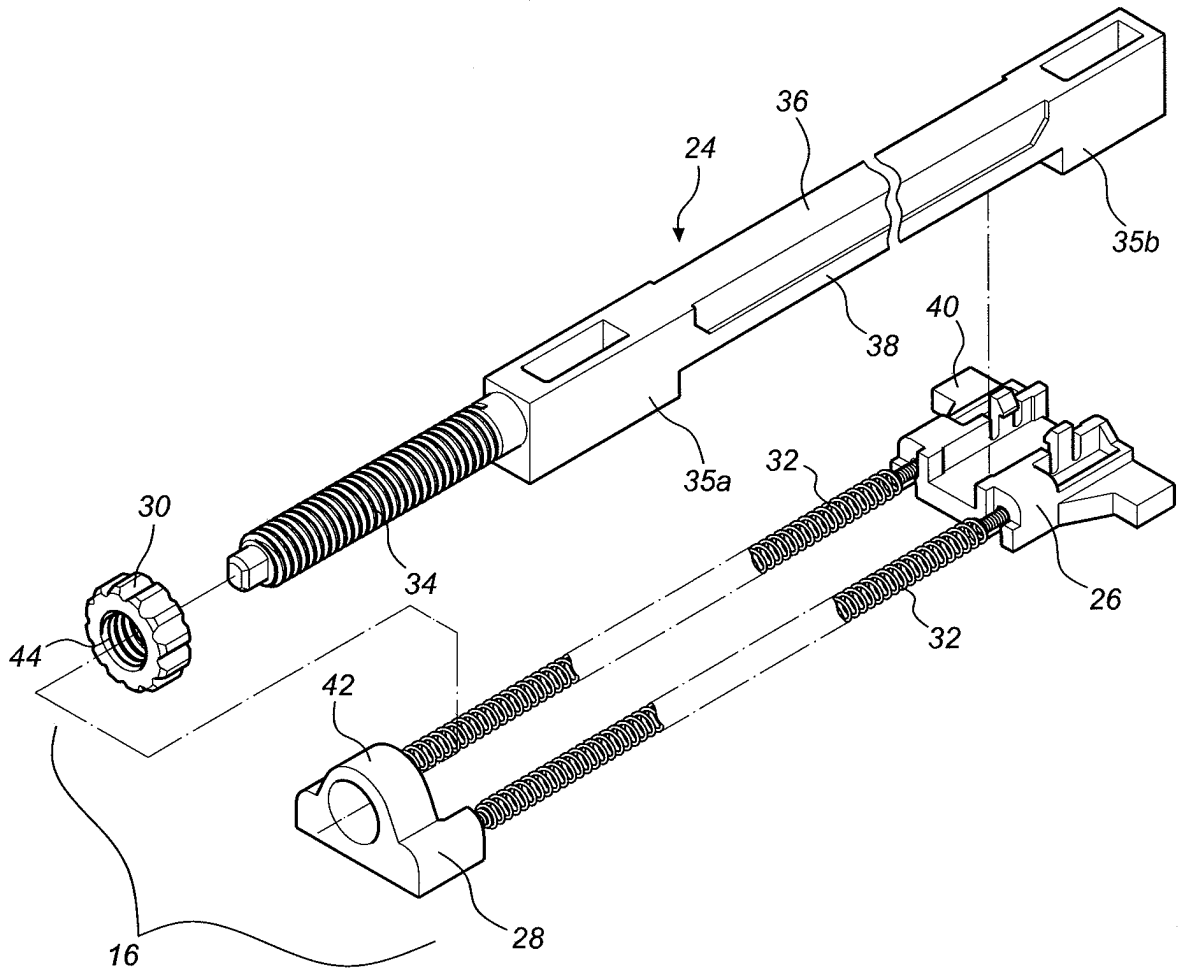


FIG. 2

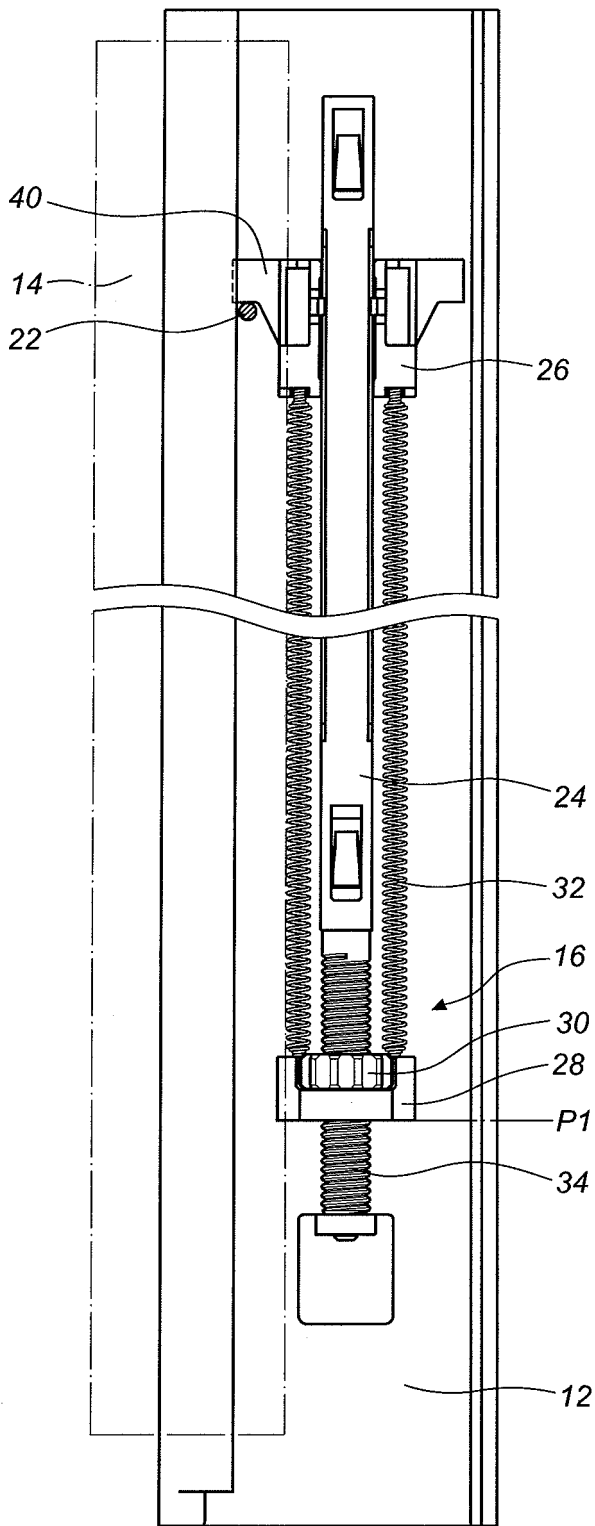


FIG. 3

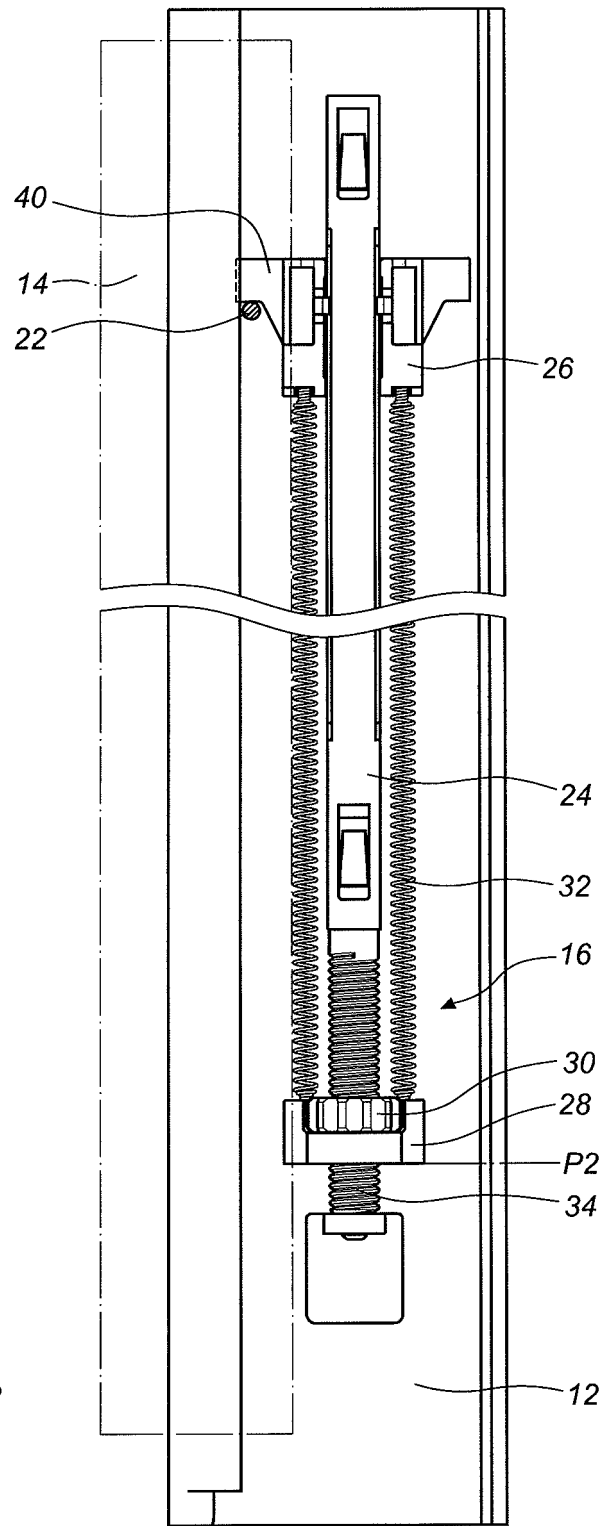


FIG. 4

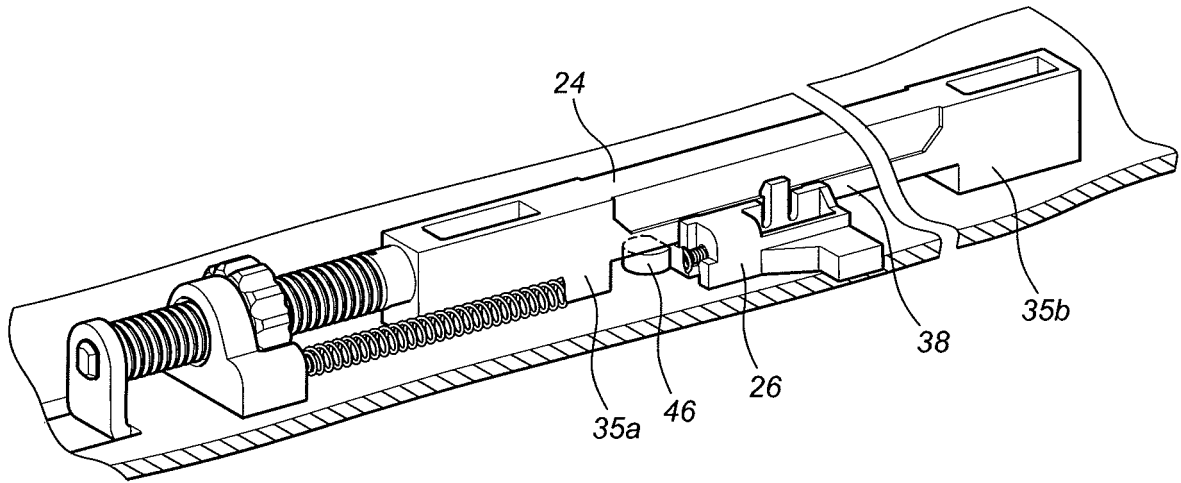


FIG. 5

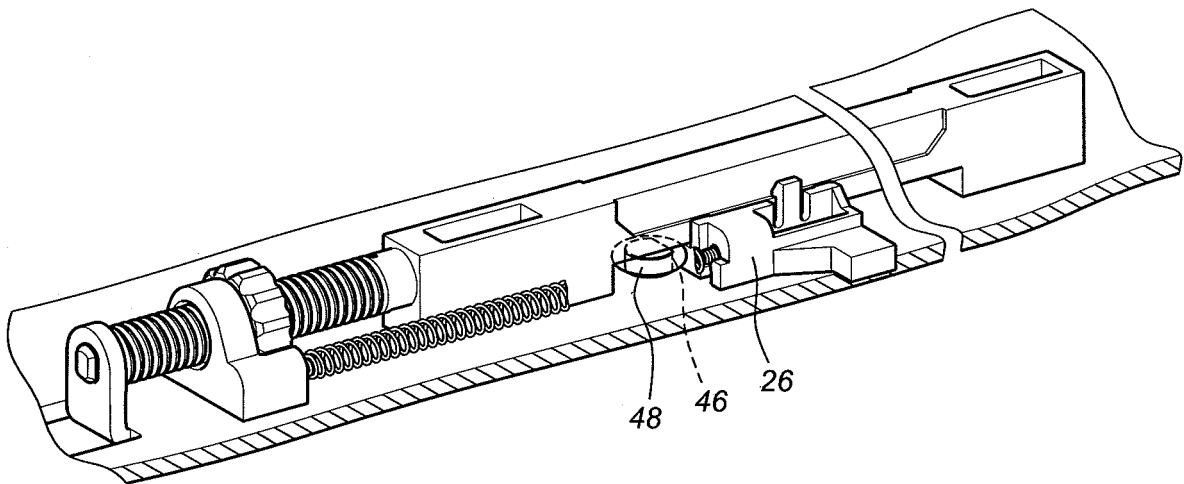


FIG. 6

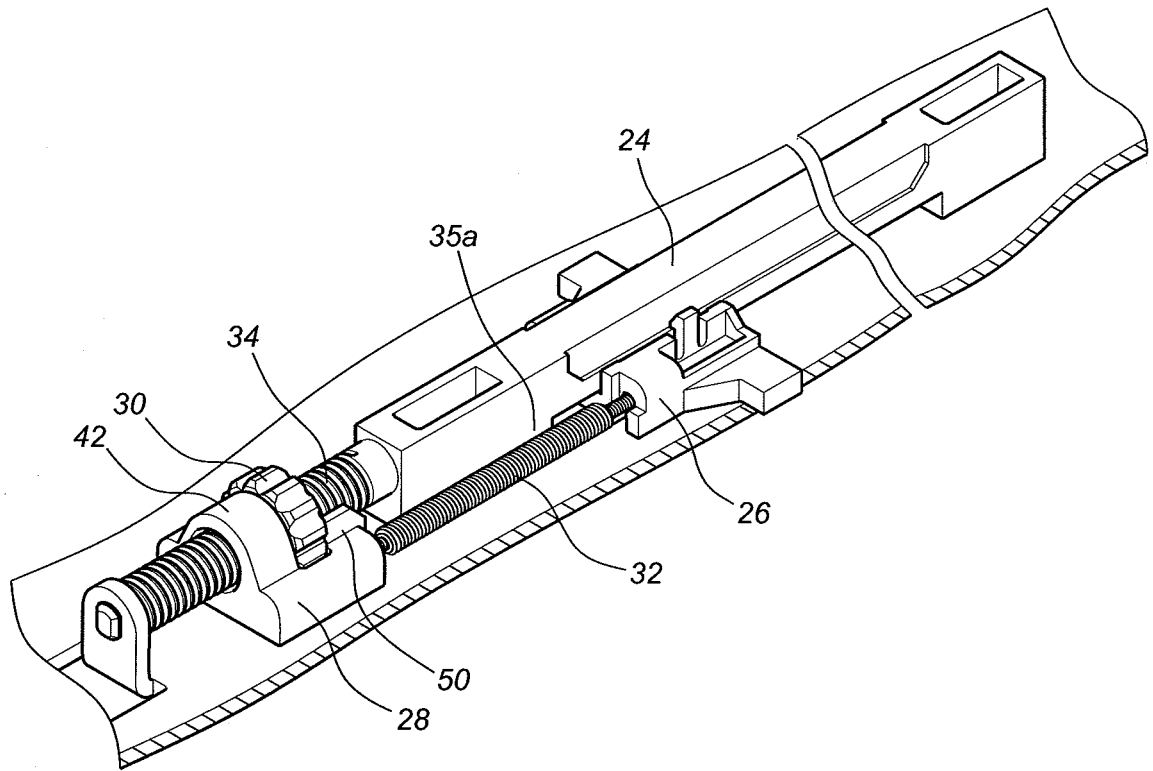


FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 7374261 B [0002]
- DE 202004000840 U1 [0004]