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(54) **Auxiliary positioning device for slide assembly**

Hilfspositionierungsvorrichtung für eine Schiebeanordnung

Dispositif de positionnement auxiliaire pour ensemble coulissant

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(56) References cited:
US-A1- 2002 096 892
US-B1- 6 247 733
US-B1- 7 347 515
US-B1- 7 374 261

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to an auxiliary positioning device, and more particularly, to an auxiliary positioning device for a slide assembly to control the slide assembly to be positioned by operation of the auxiliary positioning device when the slide assembly is to be closed.

BACKGROUND OF THE INVENTION

[0002] U.S. Patent No. 5,040,833 to Brunnert discloses a "Closing Device For Drawers", which includes a drawer installed to a furniture body. The drawer is movable between a closed position and an open position, as shown in Figs. 2-6, 18a and 18b of U.S. Patent No. 5,040,833. A spring is located between the drawer and the furniture body. A holding member is fixed to the furniture body and has a front end. A latch member is fixed to the drawer and includes a first raised area and a second raised area, wherein the second raised area includes a notch which is located corresponding to the first raised area. The second raised area further includes an inclined guide track. When the drawer is located at the closed position relative to the furniture body, the front end of the holding member is guided by the inclined guide track of the second raised area to be engaged with the notch of the second raised area. When the drawer applies a force relative to the furniture body, the front end of the holding member is guided by the guide track of the first raised area to be engaged with another guide track and is disengaged from the notch. The drawer is pushed by the force of the spring and moved to a self-opening position relative to the furniture body.

[0003] The front end of the holding member is in a free status when the drawer is opened relative to the furniture body and the holding member is disengaged from the latch member. In this status, when the drawer is pushed to its closed position, the drawer can only travel through the same processes to let the front end of the holding member engage with the notch of the latch member.

[0004] However, if the demand is that the holding member and the latch member do not have a locked relationship when the drawer is located at the close status, especially when the drawer has a self-closing function. The relationship between the holding member and the latch member has to be changed. The present invention provides an improved structure to include the functions which the conventional closing device does not have.

[0005] Another example of a self-opening device for a drawer is disclosed in US 7,347,515 B.

SUMMARY OF THE INVENTION

[0006] The present invention relates to a slide assembly with an auxiliary positioning device and comprises a first slide member and a second slide member which is longitudinally and slidably movable relative to the first slide member. The second slide member has a stored opening force relative to the first slide member when in a closed position. The auxiliary positioning device comprises a positioning member, a guiding base and a link member. The positioning member is pivotally connected to the first slide member and includes a pin member. The guiding base is attached to the second slide member and comprises a first passage, a first slot and a first wall, wherein the first wall has a first guide surface facing the first passage. The guiding base further comprises a second passage, a second slot and a second wall, wherein the second wall has a second guide surface facing the second passage. The guiding base further comprises a separation body having a guiding end which faces the first slot. The guiding base further comprises an engaging body having an engaging surface which has a portion facing the second slot. The guiding base further comprises a third passage, a third slot and a third wall, wherein the third wall has a third guide surface facing the rest portion of the engaging surface. The guiding base further comprises a fourth wall having a fourth guide surface. The link member is located corresponding to the positioning member.

[0007] When the second slide member is in a closed position relative to the first slide member, the pin member is located in a first path in the first passage of the guiding base.

[0008] When the second slide member applies a force relative to the first slide member, the pin member is guided by the first guide surface of the first wall and moves from the first path to the first slot. The pin member is located at a first position.

[0009] When the force is released, the pin member is guided by the guiding end of the separation body and moves from the first position to a second path in the second passage.

[0010] When the second slide member is retracted relative to the first slide member, the pin member is guided by the second guide surface of the second wall and moves from the second path to the second slot via the second passage. The pin member is located in a second position. When the second slide member is released, the pin member moves away from the second position and is engaged with the engaging surface of the engaging body and located in a third position.

[0011] When the second slide member further applies a force relative to the first slide member again, the pin member is guided by the third guide surface of the third wall and moves from the third position into the third slot. The pin member is located in a fourth position. When the second slide member is released, the pin member is guided by the fourth guide surface of the fourth wall.

[0012] When the second slide member moves relative to the first slide member, the link member pivots the positioning member by the movement of the second slide member.

[0013] The primary object of the present invention is to provide an auxiliary positioning device for a slide assembly to control the slide assembly to be positioned by operation of the auxiliary positioning device when the slide assembly is to be closed, such that the slide assembly is easily operated whenever it is closed or opened.

[0014] 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

[0015]

Fig. 1 shows the slide assembly according to a first embodiment of the present invention;
Fig. 2 shows a portion of the slide assembly according to the first embodiment of the present invention;
Fig. 3 shows the auxiliary positioning device according to the first embodiment of the present invention;
Fig. 4 shows that the positioning member is located in the first path relative to the guiding base when the second slide member is retracted relative to the first slide member according to the first embodiment of the present invention;
Fig. 5 shows that the second slide member applies a force relative to the first slide member and the positioning member is located at the first position relative to the guiding base according to the first embodiment of the present invention;
Fig. 6 shows that when the force is released, the positioning member is guided by the guiding base according to the first embodiment of the present invention;
Fig. 7 shows that when the force is released, the positioning member is located in the second path relative to the guiding base according to the first embodiment of the present invention;
Fig. 8 shows that when the second slide member is retracted relative to the first slide member, the positioning member is located in the second position relative to the guiding base according to the first embodiment of the present invention;
Fig. 9 shows that when the second slide member is released, the positioning member is located at the third position relative to the guiding base according to the first embodiment of the present invention;
Fig. 10 shows that when the second slide member is further pressed relative to the first slide member, the positioning member is located at the fourth position relative to the guiding base according to the first embodiment of the present invention;
Fig. 11 shows that the positioning member is guided by the fourth guide surface of the guiding base according to the first embodiment of the present invention;
Fig. 12 shows that when the second slide member is pulled relative to the first slide member, the link member is moved to push the positioning member according to the first embodiment of the present invention;
Fig. 13 is a schematic view showing the link member leaning against the positioning member according to a second embodiment of the present invention;
Fig. 14 is a schematic view showing the link member leaning against the positioning member according to a third embodiment of the present invention;
Fig. 15 is an exploded view of the guiding base according to a fourth embodiment of the present invention;
Fig. 16 is a perspective view of the guiding base according to the fourth embodiment of the present invention;
Fig. 17 is an exploded view of the guiding base according to a fifth embodiment of the present invention;
Fig. 18 is an assembled view of the guiding base according to the fifth embodiment of the present invention;
Fig. 19 is a schematic view showing a portion of the slide assembly according to the fifth embodiment of the present invention;
Fig. 20 is an assembled view showing the guiding base and the adjusting member according to the fifth embodiment of the present invention, and
Fig. 21 is a schematic view showing a portion of the slide assembly according to a sixth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Referring to Figs. 1 and 2, the slide assembly of the present invention comprises a first slide member 10, a second slide member 12 longitudinally and slidably movable relative to the first slide member 10, a movable member 14 connected to the first slide member 10 and an auxiliary positioning device 16.

[0017] The first slide member 10 includes a bottom board 18.

[0018] The second slide member 12 includes a first connector 20 and a second connector 22.

[0019] The movable member 14 is linked to move by the first connector 20 of the second slide member 12. For example, when the second slide member 12 is retracted relative to the first slide member 10 as shown in Fig. 4, the movable member 14 is connected to a first elastic member 24 and includes a first force F1 in a first direction and the first force F1 applies to the second slide member 12. The movable member 14 is engaged with the first connector 20, such that the second slide member 12 has a self-closing function relative to the first slide member 10 by the force of the first elastic member 24.

When the second slide member 12 applies a force to the first slide member 10, as shown in Fig. 5, the second slide member 12 is pushed to a distance, the first connector 20 is disengaged from the movable member 14 as shown in Figs. 6 and 7, and the force of the first elastic member 24 does not apply to the second slide member 12. In other words, the first force F1 that the movable member 14 applies to the second slide member 12 is released. As shown in Fig. 1, by a pushing member 26 to engage with the second connector 22 and a second elastic member 28 connected to the pushing member 26 for applying a second force F2 to the second slide member 12 in a second direction, the second slide member 12 has a self-opening function relative to the first slide member 10. When the second slide member 12 is in a retracted status relative to the first slide member 10, the second slide member 12 will store a force to pop out the second slide member 12. The dual functions, self-closing and self-opening functions, have been disclosed in the applicant's former European Patent Application 09165988.8 which is a reference when studying the present invention.

[0020] The auxiliary positioning device 16 comprises a positioning member 30 which is pivotably connected to the first slide member 10, a guiding base 32 attached to the second slide member 12, and a link member 34 movably connected to the first slide member 10.

[0021] The positioning member 30 includes a pin member 36 and a contact end 38 which is located at a different position from that of the pin member 36. The positioning member 30 is linked to move by the link member 34 to keep the pin member 36 at a specific position.

[0022] Referring to Figs. 2 and 3, the guiding base 32 comprises a first wall 40, a second wall 42, a third wall 44, a fourth wall 46, a connection wall 48, a separation body 50 and an engaging body 52. The connection wall 48 is connected to the first, second, third and fourth walls 40, 42, 44, 46. The first wall 40 and the separation body 50 define a first passage 54. The separation body 50 and the engaging body 52 define a second passage 56. The engaging body 52 and the fourth wall 46 define a third passage 58. The separation body 50 has a guiding end 60. The engaging body 52 includes an engaging surface 62 which is a recessed area. The first, second and connection walls 40, 42, 48 define a first slot 64a. The second, third and connection walls 42, 44, 48 define a second slot 64b. The third, fourth and the connection walls 44, 46, 48 define a third slot 64c. The third slot 64c faces the third passage 58. The first wall 40 has a first guide surface 66 in the longitudinal direction facing a portion of the first passage 54 so as to guide the first passage 54 to face the first slot 64a. The second wall 42 has a second guide surface 68 in the longitudinal direction facing a portion of the second passage 56 so as to guide the second passage 56 to face the second slot 64b. The third wall 44 has a third guide surface 70 in the longitudinal direction facing a portion of the engaging surface 62 of the engaging body 52. The fourth wall 46 includes a fourth guide surface 72 so as to guide the pin member 36 of the positioning member 30 to face the second passage 56. A portion of the guiding end 60 of the separation body 50 faces a portion of the first slot 64a in the longitudinal direction so as to guide the first slot 64a to face the second passage 56. The rest portion of the engaging surface 62 of the engaging body 52 faces the second slot 64b in the longitudinal direction. In this embodiment, the engaging body 52 further includes a fifth guide surface 74 which faces the second passage 56.

[0023] The link member 34 is moved by the movable member 14. The link member 34 has an operation end 76 to lean against the contact end 38 of the positioning member 30. As shown in Figs. 1 and 3, the positioning member 30 is pivoted by the link member 34 and rotated an angle relative to the first slide member 10.

[0024] Referring to Fig. 4, the second slide member 12 is in a retracted position relative to the first slide member 10. The pin member 36 of the positioning member 30 is located in a first path R1 relative to the first passage 54 of the guiding base 32 and the first force F1 of the movable member 14 applies to the second slide member 12 so that the second slide member 12 is maintained in the retracted position relative to the first slide member 10.

[0025] Referring to Fig. 5, the second slide member 12 applies a force to the first slide member 10, the guiding base 32 moves relative to the positioning member 30 and the pin member 36 of the positioning member 30 is guided by the first guide surface 66 of the first wall 40 of the guiding base 32 from the first path R1 in the first passage 54 to the first slot 64a of the guiding base 32, and the pin member 36 is located at a first position P1.

[0026] When the force that the second slide member 12 applies to the first slide member 10 is released, the first connector 20 of the second slide member 12 is disengaged from the movable member 14 so that the first force F1 from the first elastic member 24 no longer applies to the second slide member 12. The pushing member 26 and the second elastic member 28 apply the second force F2 to the second connector 22 of the second slide member 12 (referring to Fig. 1 and the disclosure in European Patent Application 09165988.8). The second slide member 12 is automatically opened relative to the first slide member 10. As shown in Figs. 6 and 7, the guiding base 32 is moved together with the second slide member 12 relative to the positioning member 30, the pin member 36 of the positioning member 30 is guided by the guiding end 60 of the separation body 50 and moves from the first position P1 in the first slot 64a to a second path R2 via the second passage 56 of the guiding base 32. In this status, the second slide member 12 freely pops out and can be pulled out relative to the first slide member 10.

[0027] When the force applied to the first slide member 10 by the second slide member 12 is released, the second slide member 12 only pops out a small distance relative to the first slide member 10. If the second slide member 12 is not pulled out and moves the movable

member 14, the second slide member 12 is pushed inward relative to the first slide member 10, as shown in Fig. 8, the guiding base 32 is moved relative to the positioning member 30, and the pin member 36 of the positioning member 30 is moved from the second path R2 to the second slot 64b and located at a second position P2 by the guidance of the second guide surface 68 of the second wall 42 and via the second passage 56.

[0028] Fig. 9 shows the action following the status in Fig. 8. When the force applied to the second slide member 12 is released, the second slide member 12 will drive the guiding base 32 relative to the first slide member 10 to move from the positioning member 30 by the second force F2. The pin member 36 of the positioning member 30 moves away from the second position P2 and is engaged with the engaging surface 62 of the engaging body 52 so as to be positioned at a third positioning P3.

[0029] When the second slide member 12 is popped out relative to the first slide member 10 and the second slide member 12 is not pulled relative to the first slide member 10 to a distance for moving the movable member 14 to a position that stores a force to return the second slide member 12 automatically, by changing the path between the pin member 36 in the first passage 54 and the second passage 56 as well as the pin member 36 to engage with the engaging surface 62 of the engaging body 52, the second slide member 12 can be pushed inward relative to the first slide member 10 and maintained at the retracted position. Accordingly, the second slide member 12 has no need to be pulled out for a longer distance relative to the first slide member 10.

[0030] When the second slide member 12 applies a push force relative to the first slide member 10 again, as shown in Fig. 10, the guiding base 32 moves relative to the positioning member 30 and the pin member 36 is guided by the third guide surface 70 of the third wall 44 from the engaging surface 62 of the engaging body 52 to the third slot 64c of the guiding base 32. The pin member 36 is then located at a fourth position P4. In this status, when the second slide member 12 is released again, the second slide member 12 freely pops out or is pulled out to a further distance relative to the first slide member 10, as shown in Fig. 11. The pin member 36 moves along the fourth guide surface 72 of the fourth wall 46 of the guiding base 32. When the second slide member 12 is further pushed inward relative to the first slide member 10 again, the pin member 36 is guided by the fifth guide surface 74 of the engaging body 52 and enters the second passage 56.

[0031] Fig. 12 shows that when the second slide member 12 is pulled out relative to the first slide member 10 and the movable member 14 is moved to a position that stores sufficient return force to bring the second slide member 12, the link member 34 is moved by the movement of the movable member 14. The operation end 76 of the link member 34 leans against the contact end 38 of the positioning member 30 to pivot the positioning member 30 to move the pin member 36 back to the first passage 54, which corresponds to the first path R1. Accordingly, when the second slide member 12 is retracted relative to the first slide member 10, the second slide member 12 is back to the status as shown in Fig. 4.

[0032] Fig. 13 shows a second embodiment of the present invention, wherein the movable member 200 includes a link member 202 which extends to the positioning member 30. When the second slide member 12 is pulled out, relative to the first slide member 10, to the position that can be automatically retracted as mentioned above, the positioning member 30 is pivoted by the link member 202 and the pin member 36 of the positioning member 30 is located in the first path R1.

[0033] Fig. 14 shows a third embodiment of the present invention, wherein a link member 300 is fixed to the second slide member 12 and located corresponding to the positioning member 30. When the second slide member 12 is pulled out, relative to the first slide member 10, to the position that can be automatically retracted as mentioned above, the positioning member 30 is pivoted by the link member 300 and the pin member 36 of the positioning member 30 is located in the first path R1.

[0034] Fig. 15 shows a fourth embodiment of the present invention, which includes a guiding base 400 and a connection board 402. The guiding base 400 includes a pair of engaging portions 404 and an engaging hole 406. The connection board 402 includes a pair of engaging slots 408 and an engaging member 410 corresponding to the engaging hole 406 so as to position the guiding base 400, as shown in Fig. 16. In this embodiment, the connection board 402 is connected to the second slide member 12 such that the guiding base 400 is connected to the second slide member 12.

[0035] Figs. 17 and 18 show a fifth embodiment of the present invention, which includes a guiding base 500, a connection board 502, an adjusting member 504 and a pivot member 506. The guiding base 500 includes a protrusion 508, a connection member 510, a longitudinal groove 512, and a recess 514. The connection board 502 includes a first longitudinal slot 516, a second longitudinal slot 518, a fixing hole 520 and a protruding portion 522. The protrusion 508 extends beyond the first longitudinal slot 516. The connection member 510 is inserted in the second longitudinal slot 518. The protruding portion 522 is engaged with a portion of the recess 514 so that the guiding base 500 is movably connected to the connection board 502 and moves longitudinally. The adjusting member 504 includes an aperture 524 and a spiral recess 526. The pivot member 506 extends through the aperture 524 of the adjusting member 504 and is connected with the fixing hole 520 of the connection board 502, such that the adjusting member 504 is rotatable relative to the connection board 502.

[0036] Figs. 19 and 20 show the assembled configuration of the fifth embodiment. A portion of the second slide member 12 is connected with the longitudinal groove 512 of the guiding base 500. The connection board 502 is fixed to the second slide member 12. The

protrusion 508 of the guiding base 500 is movable in the spiral recess 526. When the adjusting member 504 is rotated by the user, the protrusion 508 of the guiding base 500 will be moved in the spiral recess 526 and the guiding base 500 will be moved longitudinally relative to the connection board 502. Therefore, when the guiding base 500 is adjusted to move longitudinally relative to the second slide member 12 by operation of the adjusting member 504, a relative position between the guiding base 500 and the positioning member 30 is adjusted. Besides, this embodiment further includes a third elastic member 528 and a stop 530 which is urged by the third elastic member 528 to be contact with an end outside of the longitudinal groove 512 of the guiding base 500, such that the depth in the longitudinal direction of the second slide member 12 relative to the first slide member 10 can also be adjusted. This allows the assemblers to micro-adjust the depth of the drawer in the furniture.

[0037] Fig. 21 shows a sixth embodiment of the present invention, wherein a roller 602 is connected to a guiding base 600 and the roller 620 has a rolling surface facing the bottom board 18 of the first slide member 10. When the load in the drawer applies to the second slide member 12, the second slide member 12 slightly moves downward relative to the first slide member 10, the rolling surface of the roller 602 is supported between the guiding base 600 and the bottom board 18 of the first slide member 10 so as to ensure that the guiding base 600 is maintained at a position relative to the positioning member 30.

[0038] 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 with an auxiliary positioning device (16), comprising:

a first slide member (10);
a second slide member (12) longitudinally and slidably movable relative to the first slide member (10), the second slide member (12) having a stored opening force relative to the first slide member (10) when in a closed position;
the auxiliary positioning device (16) comprising:

a positioning member (30) pivotably connected to the first slide member (10), the positioning member (30) including a pin member (36);
a guiding base (32) attached to the second slide member (12), the guiding base (32) comprising a first passage (54), a first slot (64a) and a first wall (40), the first wall (40) having a first guide surface (66) facing the first passage (54); a second passage (56), a second slot (64b) and a second wall (42), the second wall (42) having a second guide surface (68) facing the second passage (56); a separation body (50) having a guiding end (60) which faces the first slot (64a); an engaging body (52) having an engaging surface (62) which has a portion facing the second slot (64b); a third passage (58), a third slot (64c) and a third wall (44), the third wall (44) having a third guide surface (70) facing the rest portion of the engaging surface (62); a fourth wall (46) having a fourth guide surface (72); and
a link member (34) located corresponding to the positioning member (30);
wherein the auxiliary positioning device (16) is formed and arranged such that

- the pin member (36) is located in a first path (R1) in the first passage (54) of the guiding base (32) when the second slide member (12) is in the closed position relative to the first slide member (10);
- the pin member (36) is guided by the first guide surface (66) of the first wall (40) and moves from the first path (R1) to the first slot (64a) and the pin member (36) is located at a first position (P1) when the second slide member (12) applies a force relative to the first slide member (10);
- the pin member (36) is guided by the guiding end (60) of the separation body (50) and moves from the first position (P1) to a second path (R2) in the second passage (56) when the force is released;
- the pin member (36) is guided by the second guide surface (68) of the second wall (42) and moves from the second path (R2) to the second slot (64b) via the second passage (56) and the pin member (36) is located in a second position (P2) when the second slide member (12) is retracted relative to the first slide member (10);
- the pin member (36) moves away from the second position (P2) to engage with the engaging surface (62) of the engaging body (52) and located in a third position (P3) when the second slide member (12) is released;
- the pin member (36) is guided by the third guide surface (70) of the third wall (44) and moves away from the third position (P3) into the third slot (64c) and

the pin member (36) is located in a fourth position (P4) when the second slide member (12) further applies a force relative to the first slide member (10);
- the pin member (36) is guided by the fourth guide surface (72) of the fourth wall (46) when the second slide member (12) is released;
- the link member (34) pivots the positioning member (30) by the movement of the second slide member (12) when the second slide member (12) moves relative to the first slide member (10).

2. The slide assembly as claimed in claim 1, wherein the first passage (54) is defined by the first wall (40) and the separation body (50); the second passage (56) is defined by the separation body (50) and the engaging body (52); the third passage (58) is defined by the engaging body (52) and the fourth wall (46); the first slot (64a) is defined by the first and second walls (40,42), the second slot (64b) is defined by the second and third walls (42,44); the third slot (64c) is defined by the third and fourth walls (44,46).

3. The slide assembly as claimed in claim 1, wherein the guiding base (32) includes a connection wall (48) which is connected to the first, second and third walls (40, 42, 44), and the connection wall (48) is located corresponding to the first and second slots (64a, 64b).

4. The slide assembly as claimed in claim 1, wherein the engaging surface (62) of the engaging body (52) is a recessed area.

5. The slide assembly as claimed in claim 1, further comprising a connection board (402) which includes a pair of engaging slots (408) and an engaging member (410), the guiding base (400) including a pair of engaging portions (404) corresponding to the engaging slots (408) and an engaging hole (406) corresponding to the engaging member (410) to engage with each other.

6. The slide assembly as claimed in claim 1, further comprising a connection board (502), an adjusting member (504) and a pivot member (506), the connection board (502) being fixed to the second slide member (12) and connected to the guiding base (500), the connection board (502) including a first longitudinal slot (516), a second longitudinal slot (518), a fixing hole (520) and a protruding portion (522), the guiding base (500) including a protrusion (508), a connection member (510), a longitudinal groove (512) and a recess (514), the protrusion (508) extending beyond the first longitudinal slot (516) and the connection member (510) engaged with the second longitudinal slot (518), the protruding portion (522) engaged with a portion of the recess (514) so that the guiding base (500) is connected to the connection board (502) and moves longitudinally, the adjusting member (504) including an aperture (524) and a spiral recess (526), the pivot member (506) extending through the aperture (524) of the adjusting member (504) and connected with the fixing hole (520) of the connection board (502), a portion of the second slide member (12) connected with the longitudinal groove (512) of the guiding base (500), the protrusion (508) of the guiding base (500) engaged with the spiral recess (526).

7. The slide assembly as claimed in claim 1, wherein the first slide member (10) has a movable member (14) connected thereto and the second slide member (12) has a first connector (20), the movable member (14) being linked to move by the first connector (20) of the second slide member (12), the link member (34) being driven by the movable member (14) to push and turn the positioning member (30).

8. The slide assembly as claimed in claim 7, wherein the link member (34) is movably connected to the first slide member (10).

9. The slide assembly as claimed in claim 7, wherein the link member (34) is connected to the movable member (14).

10. The slide assembly as claimed in claim 1, wherein the link member (34) is connected to the second slide member (12).

11. The slide assembly as claimed in claim 7, wherein the movable member (14) is connected with a first elastic member (24) which applies a first force in a first direction to the second slide member (12) for the second slide member (12) to be closed automatically relative to the first slide member (10) when the second slide member (12) is retracted relative to the first slide member (10).

12. The slide assembly as claimed in claim 1, wherein the stored opening force is defined by a second elastic member (28) and a pushing member (26) which is connected with the second elastic member (28), the second slide member (12) including a second connector (22), the pushing member (26) engaging with the second connector (22) by a force of the second elastic member (28) for the second slide member (12) to have the stored opening force when the second slide member (12) is retracted relative to the first slide member (10).

13. The slide assembly as claimed in claim 1, further

comprising a third elastic member (528) and a stop (530) which is urged by the third elastic member (528) to lean against an end outside of a longitudinal groove (512) of the guiding base (500).

14. The slide assembly as claimed in claim 1, further comprising a roller (602) connected to the guiding base (600), the roller (602) having a rolling surface facing a bottom board (18) of the first slide member (10).

Patentansprüche

1. Ein Gleitaufbau mit einer Hilfspositioniersystem (16), aufweisend:

einem ersten Gleitelement (10);
einem zweiten Gleitelement (12), das sich der Länge nach und gleitbar zum ersten Gleitelement (10) bewegen läßt, wobei das zweite Gleitelement (12) entsprechend dem ersten Gleitelement (10) in einer geshlossenen Position über eine gespeicherte Öffnungskraft verfügt;
wobei das Hilfspositioniersystem (16) aufgebaut ist aus:

einem Positionierelement (30), das drehbar am ersten Gleitelement (10) befestigt ist und das Positionierelement (30) mit einem Stiftelement (36) versehen ist;
einer Führungsbasis (32), die am zweiten Gleitelement (12) befestigt ist, wobei die Führungsbasis (32) mit einem ersten Durchgang (54), einer ersten Schlitzöffnung (64a) und mit einer Wand (40) versehen ist; die erste Wand (40) mit einer ersten Gleitfläche (66) gegenüber dem ersten Durchgang (54), einem zweiten Durchgang (56), einer zweiten Schlitzöffnung (64b) und mit einer zweiten Wand (42) versehen ist; die zweite Wand (42) gegenüber dem zweiten Durchgang (56) mit einer zweiten Gleitfläche (68) versehen ist; ein Abscheidekörper (50) gegenüber der ersten Schlitzöffnung (64a) mit einem Führungsende (60) versehen ist; ein Einrastkörper (52) ist mit einer Einrastfläche (62) versehen, die sich gegenüber der zweiten Schlitzöffnung (64b) befindet; ein dritter Durchgang (58), eine dritte Schlitzöffnung (64c) und eine dritte Wand (44), wobei die dritte Wand (44) gegenüber dem Auflageteil der Einrastfläche (62) gebildet ist; mit einer dritten Gleitfläche (70) versehen ist; eine vierte Wand (46) mit einer vierten Führungsfläche (72) versehen ist; und
einem Verbindungselement (34), das in Übereinstimmung mit dem Positionierelement (30) angeordnet ist;

dadurch gekennzeichnet, dass das Hilfspositioniersystem (16) so geformt and angeordnet ist, dass

- das Stiftelement (36) sich in einer ersten Spur (R1) im ersten Durchgang (54) der Führungsbasis (32) befindet, sobald das zweite Gleitelement (12) in Übereinstimmung zum ersten Gleitelement (10) in der geschlossenen Position ist;
- das Stiftelement (36) mit der ersten Gleitfläche (66) der ersten Wand (40) geführt und von der ersten Spur (R1) zur ersten Schlitzöffnung (64a) bewegt wird, wobei sich das Stiftelement (36) an einer ersten Position (P1) befindet, sobald das zweite Gleitelement (12) eine Kraft in Übereinstimmung mit dem ersten Gleitelement (10) ausübt;
- das Stiftelement (36) mit dem Führungsende (60) des Abscheidekörpers (50) geführt und beim Nachlassen der Kraft von der ersten Position (P1) in eine zweite Spur (R2) im zweiten Durchgang (56) bewegt wird;
- das Stiftelement (36) mit der zweiten Gleitfläche (68) der zweiten Wand (42) geführt und durch den zweiten Durchgang (56) von der zweiten Spur (R2) in die zweite Schlitzöffnung (64b) bewegt wird; und das Stiftelement (36) sich in einer zweiten Position (P2) befindet, wenn das zweite Gleitelement (12) in Übereinstimmung mit dem ersten Gleitelement (10) zurückgezogen wird;
- das Stiftelement (36) von der zweiten Position (P2) weg bewegt wird, um in die Einrastfläche (62) des Einrastkörpers (52) einzurasten und es sich in einer dritten Position (P3) befindet, wenn das zweite Gleitelement (12) ausgerückt wird;
- das Stiftelement (36) mit der dritten Gleitfläche (70) der dritten Wand (44) angetrieben und von der dritten Position (P3) weg und in die dritte Schlitzöffnung (64c) bewegt wird, wobei sich das Stiftelement (36) in einer vierten Position (P4) befindet, wenn mit dem zweiten Gleitelement (12) eine Kraft in Übereinstimmung mit dem ersten Gleitelement (10) ausgeübt wird;
- das Stiftelement (36) mit der vierten Gleitfläche (72) der vierten Wand (46) angetrieben wird, wenn das zweite Gleitelement (12) ausgerückt wird;
- das Verbindungselement (34) mit der Bewegung des zweiten Gleitelements (12) um das Positionierelement (30) gedreht wird, wenn das zweite Gleitelement (12) in Übereinstimmung mit dem ersten Gleitelement (10) bewegt wird.

2. Der Gleitaufbau nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Durchgang (54) mit

der ersten Wand (40) und mit dem Abscheidekörper (50) gebildet wird; der zweite Durchgang (56) mit dem Abscheidekörper (50) und dem Einrastkörper (52) gebildet ist; der dritte Durchgang (58) mit dem Einrastkörper (52) und der vierten Wand (46) gebildet wird; die erste Schlitzöffnung (64a) mit der ersten und der zweiten Wand (40, 42), die zweite Schlitzöffnung (64b) mit der zweiten und der dritten Wand (42, 44) und die dritte Schlitzöffnung (64c) mit der dritten und der vierten Wand (44, 46) gebildet wird.

3. Der Gleitaufbau nach Anspruch 1, **dadurch gekennzeichnet, dass** die Führungsbasis (32) mit einer Verbundwand (48) gebildet ist, die mit dr ersten, zweiten und mit der dritten Wand (40, 42, 44) verbunden ist, wobei die Verbundwand (48) in Übereinstimmung mit der ersten und der zweiten Schlitzöffnung (64a, 64b) angeordnet ist.

4. Der Gleitaufbau nach Anspruch 1, **dadurch gekennzeichnet, dass** die Einrastfläche (62) des Einrastkörpers (52) als eine Vertiefung gebildet ist.

5. Der Gleitaufbau nach Anspruch 1, weiter aufgebaut aus einer Befestigungsplatte (402), die mit einem Paar von Einrastschlitzen (408) und mit einem Einrastelement (410) gebildet ist, wobei die Führungsbasis (400) ein Paar von Einrastteilen (404) aufweist, die nach den Einrastschlitzen (408) ausgerichtet sind, wobei eine Einrastöffnung (406) nach dem Einrastelement (410) ausgerichtet ist, um in dieses einzudrücken.

6. Der Gleitaufbau nach Anspruch 1, weiter aufgebaut aus einer Befestigungsplatte (502), einem Justierelement (504) und aus einem Drehelement (506), wobei die Befestigungsplatte (502) am zweiten Gleitelement (12) befestigt und mit der Führungsbasis (500) verbunden ist; die Befestigungsplatte (502) mit einer ersten Längsschlitzöffnung (516), zweiten Längsschlitzäffnung (518), einem Befestigungsloch (520) und mit einem hervorstehenden Teil (522) versehen ist, die Führungsbasis (500) einen Vorsprung (508), ein Verbundelement (510), eine Längsrille (512) und eine Vertiefung (514) aufweist; der Vorsprung (508) sich über die erste Längsschlitzöffnung (516) erstreckt und das Verbundelement (510) in die zweite Längsschlitzöffnung (518) eingerastet ist; das hervorstehende Teil (522) in einen Teil der Vertiefung (514) eingerastet ist, um die Führungsbasis (500) für die Bewegung der Länge nach an der Befestigungsplatte (502) zu befestigen; das Justierelement (504) mit einer Öffnung (524) und mit einer spiralförmigen Nut (526) versehen ist; das Drehelement (506) durch die Öffnung (524) des Justierelementes (504) ragt und im Befestigungsloch (520) der Befestigungsplatte (502) montiert ist; ein Teil des zweiten Gleitelements (12) in der Längsrille (512) der Führungsbasis (500) befestigt ist; und der Vorsprung (508) der Führungsbasis (500) in der spiralförmigen Nut (526) eingerastet ist.

7. Der Gleitaufbau nach Anspruch 1, **dadurch gekennzeichnet, dass** das erste Gleitelement (10) mit einem daran befestigten beweglichen Teil (14) und das zweite Gleitelement (12) mit einem ersten Befestigungsteil (20) versehen ist; das bewegliche Teil (14) verbunden ist, um mit dem ersten Befestigungsteil (20) des zweiten Gleitelementes (12) bewegt zu werden; das Verbindungselement (34) mit dem beweglichen Teil (14) angetrieben wird, um das Positionierelement (30) anzuschieben und zu drehen.

8. Der Gleitaufbau nach Anspruch 7, **dadurch gekennzeichnet, dass** das Verbindungselement (34) beweglich am ersten Gleitelement (10) befestigt ist.

9. Der Gleitaufbau nach Anspruch 7, **dadurch gekennzeichnet, dass** das Verbindungselement (34) am beweglichen Teil (14) befestigt ist.

10. Der Gleitaufbau nach Anspruch 1, **dadurch gekennzeichnet, dass** das Verbindungselement (34) am zweiten Gleitelement (12) befestigt ist.

11. Der Gleitaufbau nach Anspruch 7, **dadurch gekennzeichnet, dass** das bewegliche Teil (14) am ersten elastischen Element (24) befestigt ist, wobei mit letzterem eine erste Kraft in eine erste Richtung auf das zweite Gleitelement (12) ausgeübt wird, um das zweite Gleitelement (12) automatisch in Übereinstimmung mit dem ersten Gleitelement (10) zu schließen, wenn das zweite Gleitelement (12) in Übereinstimmung mit dem ersten Gleitelement (10) eingezogen wird.

12. Der Gleitaufbau nach Anspruch 1, **dadurch gekennzeichnet, dass** die gespeicherte Öffnungskraft mit einem zweiten elastischen Element (28) und mit einem an diesem zweiten elastischen Element (28) befestigten Schubelement (26) bestimmt wird; das zweite Gleitelement (12) mit einem zweiten Anschlußteil (22) versehen ist; das Schubelement (26) mit einer Kraft des zweiten elastischen Elements (28) in das zweite Anschlußteil (22) eingerückt wird, um dem zweiten Gleitelement (12) die gespeicherte Öffnungskraft zu verleihen, wenn dieses zweite Gleitelement (12) in Übereinstimmung mit dem ersten Gleitelement (10) eingezogen wird.

13. Der Gleitaufbau nach Anspruch 1, weiter aufgebaut aus einem dritten elastischen Element (528) und einem Anschlag (530), wobei dieser Anschlag (530) mit dem dritten elastischen Element (528) an ein Ende außerhalb der länglichen Rille (512) der Führungsbasis (500) angedrückt wird.

14. Der Gleitaufbau nach Anspruch 1, weiter aufgebaut aus einer Rolle (602), die an der Führungsbasis (600) befestigt ist, wobei die Rolle (602) gegenüber dem Brett (18) auf der Unterseite mit einer Rollfläche des ersten Gleitelements (10) versehen ist.

Revendications

1. Un ensemble coulissant avec un dispositif auxiliaire de positionnement (16), comprenant :

un premier élément coulissant (10) ;
un second élément coulissant (12) déplaçable longitudinalement et de façon coulissante par rapport au premier élément coulissant (10), le second élément coulissant (12) ayant une force d'ouverture réservée par rapport au premier élément coulissant (10) lorsqu'en position fermée ;
le dispositif auxiliaire de positionnement (16) comprenant :

un élément de positionnement (30) relié de façon pivotante au premier élément coulissant (10), l'élément de positionnement (30) comprenant un élément mâle (36) ;
une base de guidage (32) attachée au second élément coulissant (12), la base de guidage (32) comprenant un premier passage (54), une première entaille (64a) et une première paroi (40), la première paroi (40) ayant une première surface de guidage (66) en face du premier passage (54) ; un deuxième passage (56), une deuxième entaille (64b) et une deuxième paroi (42), la deuxième paroi (42) ayant une deuxième surface de guidage (68) en face du deuxième passage (56) ; un corps de séparation (50) ayant une extrémité de guidage (60) faisant face à la première entaille (64a) ; un corps d'engagement (52) ayant une surface d'engagement (62) qui a une partie en face de la deuxième entaille (64b) ; un troisième passage (58), une troisième entaille (64c) et une troisième paroi (44), la troisième paroi (44) ayant une troisième surface de guidage (70) en face de la partie de repos de la surface d'engagement (62) ; une quatrième paroi (46) ayant une quatrième surface de guidage (72) ; et
un élément de liaison (34) situé de manière correspondante à l'élément de positionnement (30) ;
où le dispositif auxiliaire de positionnement (16) et formé et arrangé de sorte que

- l'élément mâle (36) est situé dans une première trajectoire (R1) dans le premier passage (54) de la base de guidage (32) quand le second élément coulissant (12) est en position fermée par rapport au premier élément coulissant (10) ;
- l'élément mâle (36) est guidé par la première surface de guidage (66) de la première paroi (40) et se déplace de la première trajectoire (R1) à la première entaille (64a) et l'élément mâle (36) est situé à une première position (P1) quand le second élément coulissant (12) applique une force par rapport au premier élément coulissant (10) ;
- l'élément mâle (36) est guidé par l'extrémité de guidage (60) du corps de séparation (50) et se déplace de la première position (P1) à une deuxième trajectoire (R2) dans le second passage (56) quand la force est libérée ;
- l'élément mâle (36) est guidé par la seconde surface de guidage (68) de la seconde paroi (42) et se déplace de la deuxième trajectoire (R2) à la seconde entaille (64b) via le second passage (56) et l'élément mâle (36) est situé dans une deuxième position (P2) quand le second élément coulissant (12) est rétracté par rapport au premier élément coulissant (10) ; l'élément mâle (36) s'éloigne de la deuxième position (P2) pour s'engager avec la surface d'engagement (62) du corps d'engagement (52) et situé dans une troisième position (P3) quand le second élément coulissant (12) est libéré ;
- l'élément mâle (36) est guidé par la troisième surface de guidage (70) de la troisième paroi (44) et s'éloigne de la troisième position (P3) dans la troisième entaille (64c) et l'élément mâle (36) est situé dans une quatrième position (P4) quand le second élément coulissant (12) applique à nouveau une force par rapport au premier élément coulissant (10) ;
- l'élément mâle (36) est guidé par la quatrième surface de guidage (72) de la quatrième paroi (46) quand le second élément coulissant (12) est libéré ;
- l'élément de liaison (34) fait pivoter l'élément de positionnement (30) par le mouvement du second élément coulissant (12) quand le second élément coulissant (12) se déplace par rapport au premier élément coulissant (10).

2. L'ensemble coulissant tel que revendiqué dans la

revendication 1, où le premier passage (54) est défini par la première paroi (40) et le corps de séparation (50) ; le second passage (56) est défini par le corps de séparation (50) et le corps d'engagement (52) ; le troisième passage (58) est défini par le corps d'engagement (52) et la quatrième paroi (46) ; la première entaille (64a) est définie par la première et la deuxième paroi (40,42), la seconde entaille (64b) est définie par la deuxième et la troisième paroi (42,44) ; la troisième entaille (64c) est définie par la troisième et la quatrième paroi (44,46).

3. L'ensemble coulissant tel que revendiqué dans la revendication 1, où la base de guidage (32) comprend une paroi de connexion (48) qui est reliée à la première, deuxième et troisième paroi (40, 42, 44), et la paroi de connexion (48) est située de manière correspondante à la première et deuxième entailles (64a, 64b).

4. L'ensemble coulissant tel que revendiqué dans la revendication 1, où la surface d'engagement (62) du corps d'engagement (52) est un emplacement évidé.

5. L'ensemble coulissant tel que revendiqué dans la revendication 1, comprenant en outre une plaque de connexion (402) qui comprend une paire d'entailles d'engagement (408) et un élément d'engagement (410), la base de guidage (400) comprenant une paire de parties d'engagement (404) de manière correspondante aux entailles d'engagement (408) et un trou d'engagement (406) de manière correspondante à l'élément d'engagement (410) pour s'engager mutuellement.

6. L'ensemble coulissant tel que revendiqué dans la revendication 1, comprenant en outre une plaque de connexion (502), un élément de réglage (504) et un élément de pivot (506), la plaque de connexion (502) étant fixée au second élément coulissant (12) et reliée à la base de guidage (500), la plaque de connexion (502) comprenant une première entaille longitudinale (516), une seconde entaille longitudinale (518), un trou de fixation (520) et une partie saillante (522), la base de guidage (500) comprenant a protrusion (508), un élément de connexion (510), une rainure longitudinale (512) et un évidement (514), la protrusion (508) s'étendant au-delà de la première entaille longitudinale (516) et l'élément de connexion (510) engagé avec la seconde entaille longitudinale (518), la partie saillante (522) engagée avec une partie de l'évidement (514) de sorte que la base de guidage (500) est reliée à la plaque de connexion (502) et se déplace longitudinalement, l'élément de réglage (504) comprenant une ouverture (524) et une empreinte spirale (526), l'élément de pivot (506) au travers de l'ouverture (524) de l'élément de réglage (504) et relié avec le trou de fixation (520) de la plaque de connexion (502), une partie du second élément coulissant (12) reliée avec la rainure longitudinale (512) de la base de guidage (500), la protrusion (508) de la base de guidage (500) engagée avec l'empreinte spirale (526).

7. L'ensemble coulissant tel que revendiqué dans la revendication 1, où le premier élément coulissant (10) a un élément déplaçable (14) qui lui est relié et le second élément coulissant (12) a un premier connecteur (20), l'élément déplaçable (14) étant relié pour se déplacer grâce au premier connecteur (20) du second élément coulissant (12), l'élément de liaison (34) étant actionné par l'élément déplaçable (14) pour pousser et tourner l'élément de positionnement (30).

8. L'ensemble coulissant tel que revendiqué dans la revendication 7, où l'élément de liaison (34) est relié de façon amovible au premier élément coulissant (10).

9. L'ensemble coulissant tel que revendiqué dans la revendication 7, où l'élément de liaison (34) est relié à l'élément déplaçable (14).

10. L'ensemble coulissant tel que revendiqué dans la revendication 1, où l'élément de liaison (34) est relié au second élément coulissant (12).

11. L'ensemble coulissant tel que revendiqué dans la revendication 7, où l'élément déplaçable (14) est relié avec un premier élément élastique (24) qui applique une première force dans une première direction au second élément coulissant (12) pour que le second élément coulissant (12) se ferme automatiquement par rapport au premier élément coulissant (10) quand le second élément coulissant (12) est rétracté par rapport au premier élément coulissant (10).

12. L'ensemble coulissant tel que revendiqué dans la revendication 1, où la force d'ouverture réservée est définie par un deuxième élément élastique (28) et un élément poussoir (26) qui est relié avec le deuxième élément élastique (28), le second élément coulissant (12) comprenant un second connecteur (22), l'élément poussoir (26) s'engageant avec le second connecteur (22) par une force du deuxième élément élastique (28) pour que le second élément coulissant (12) ait la force d'ouverture réservée quand le second élément coulissant (12) est rétracté par rapport au premier élément coulissant (10).

13. L'ensemble coulissant tel que revendiqué dans la revendication 1, comprenant en outre un troisième élément élastique (528) et un arrêt (530) qui est forcé par le troisième élément élastique (528) pour venir contre une extrémité à l'extérieur d'une rainure lon-

gitudinale (512) de la base de guidage (500).

14. L'ensemble coulissant tel que revendiqué dans la revendication 1, comprenant en outre un rouleau (602) relié à la base de guidage (600), le rouleau (602) ayant une surface de roulage en face d'une plaque inférieure (18) du premier élément coulissant (10).

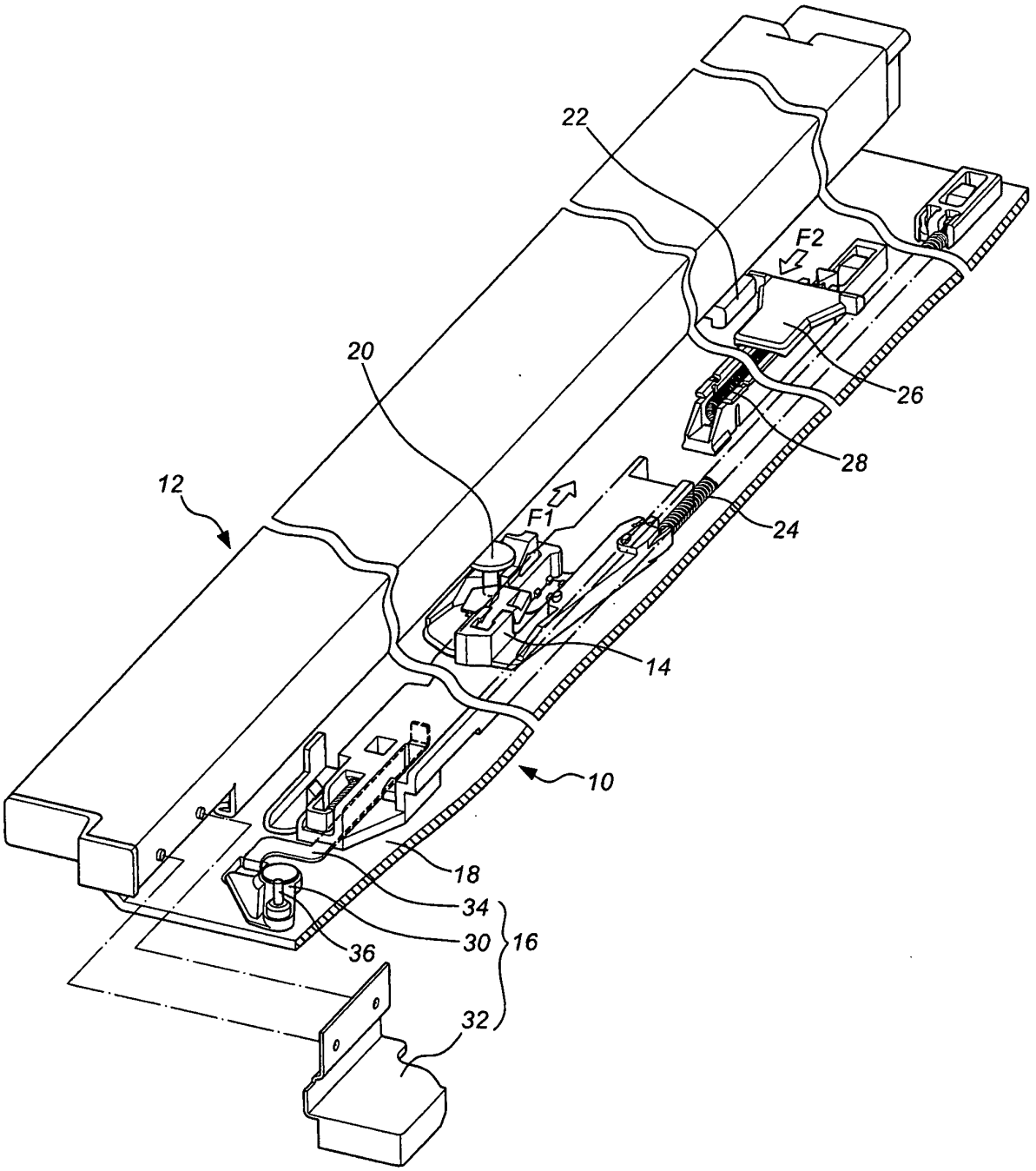


FIG. 1

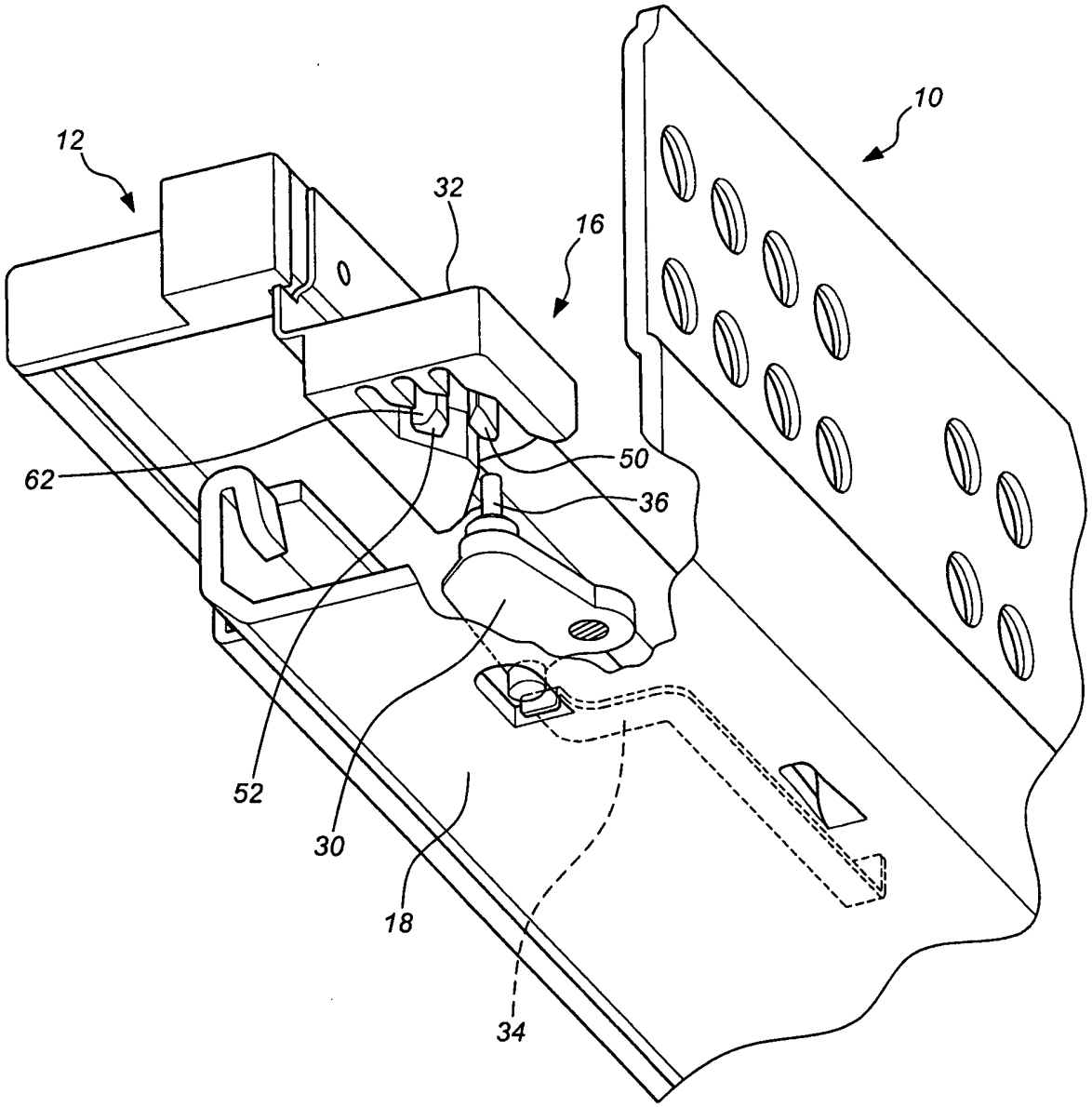
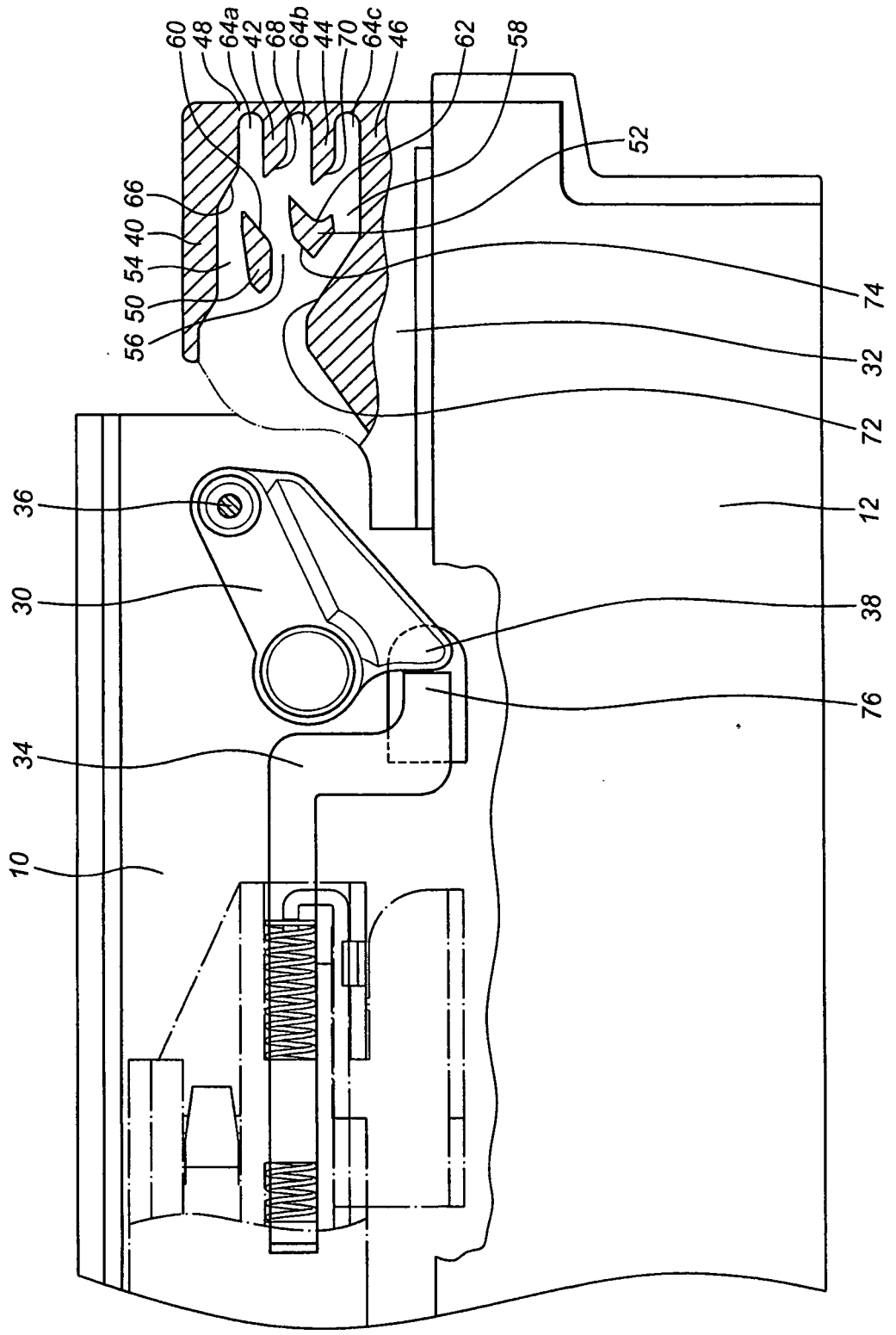


FIG. 2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64a
42
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64b
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64c
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FIG. 3

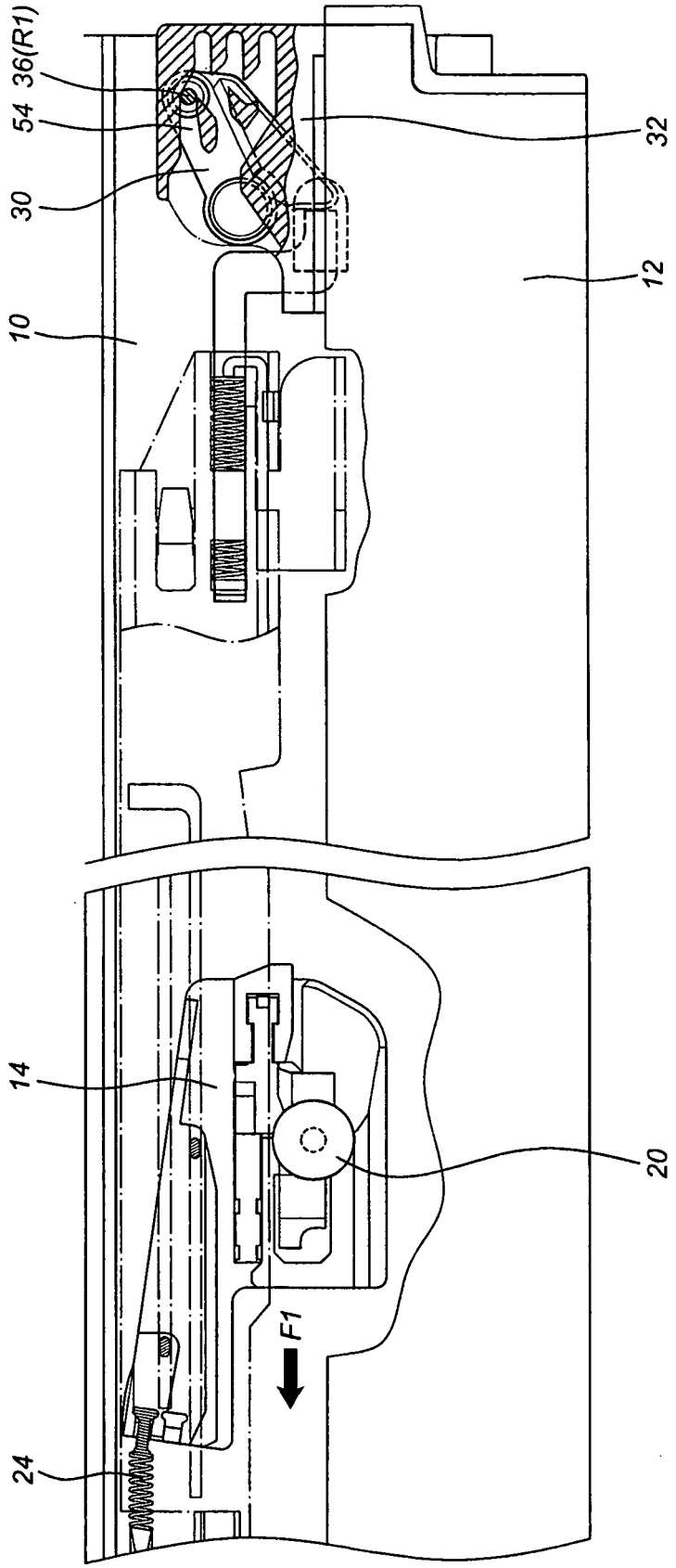

FIG. 4

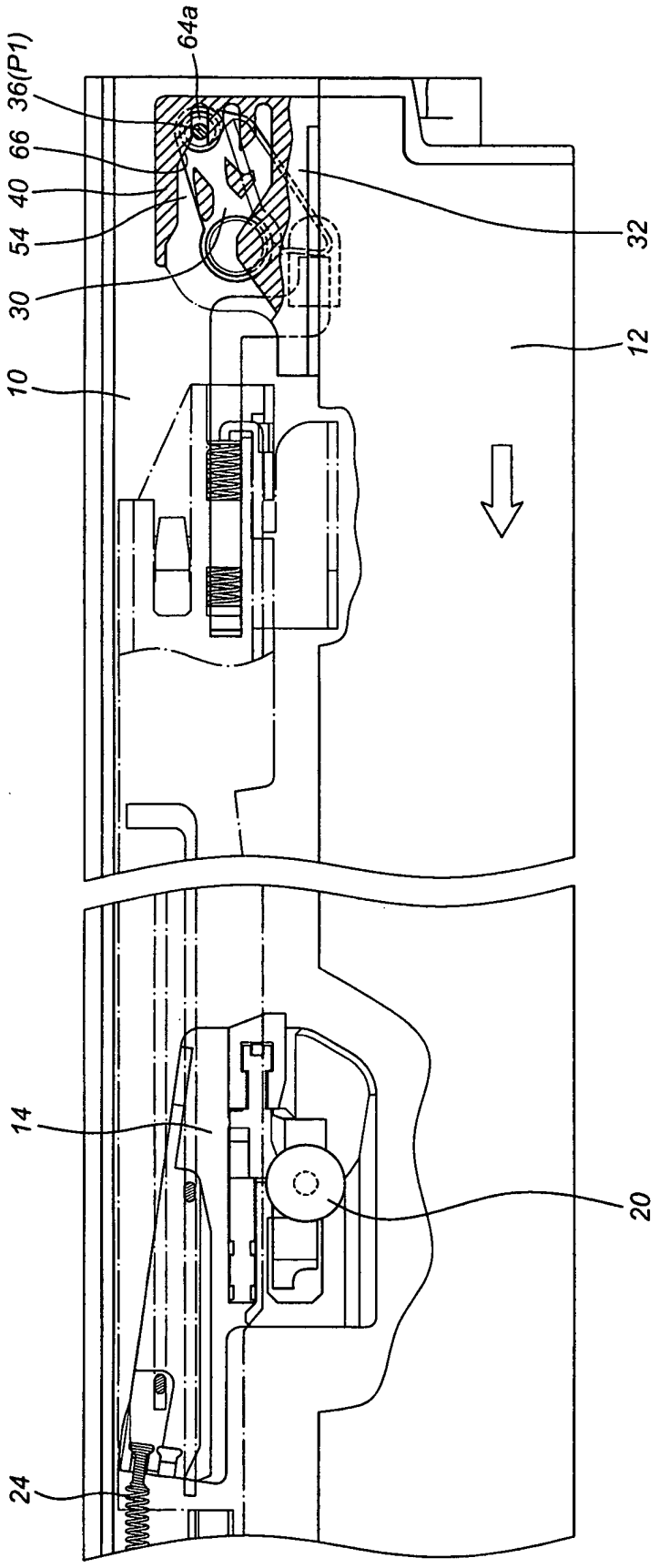

FIG. 5

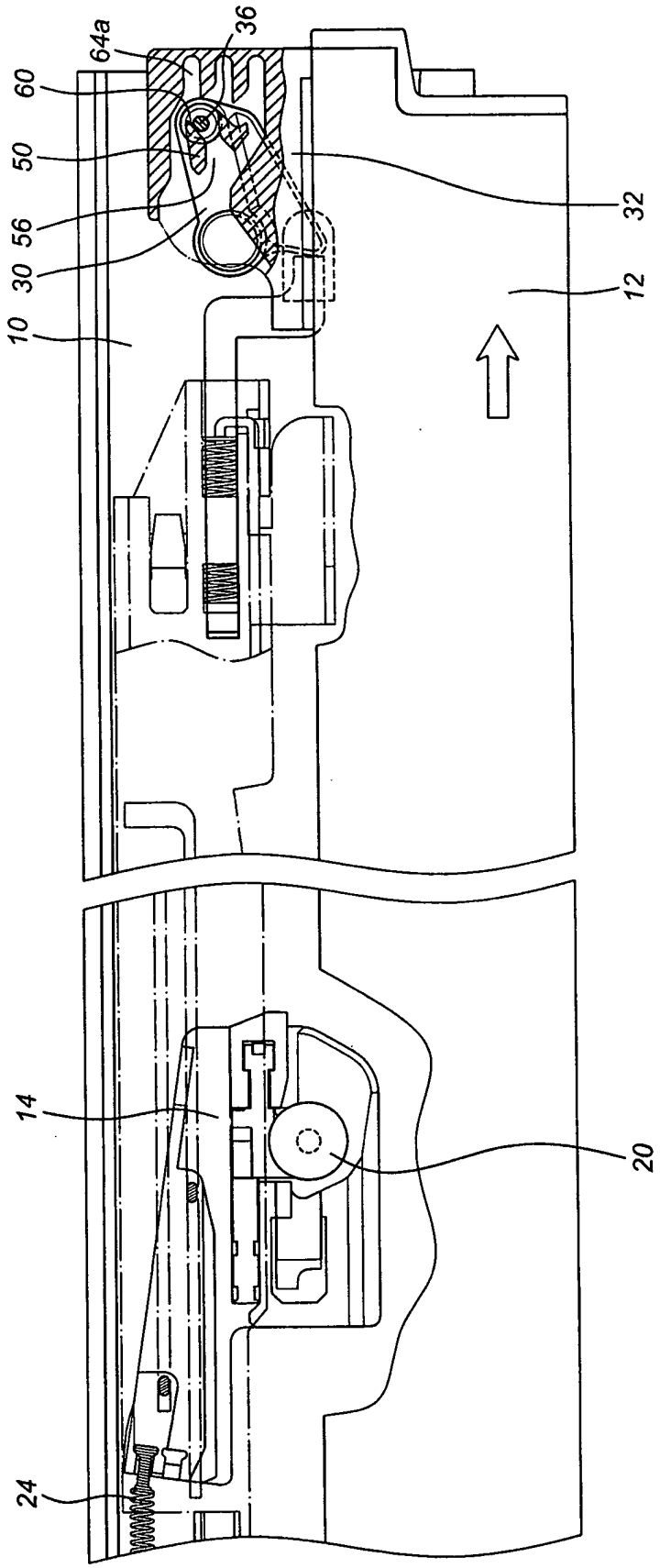

FIG. 6

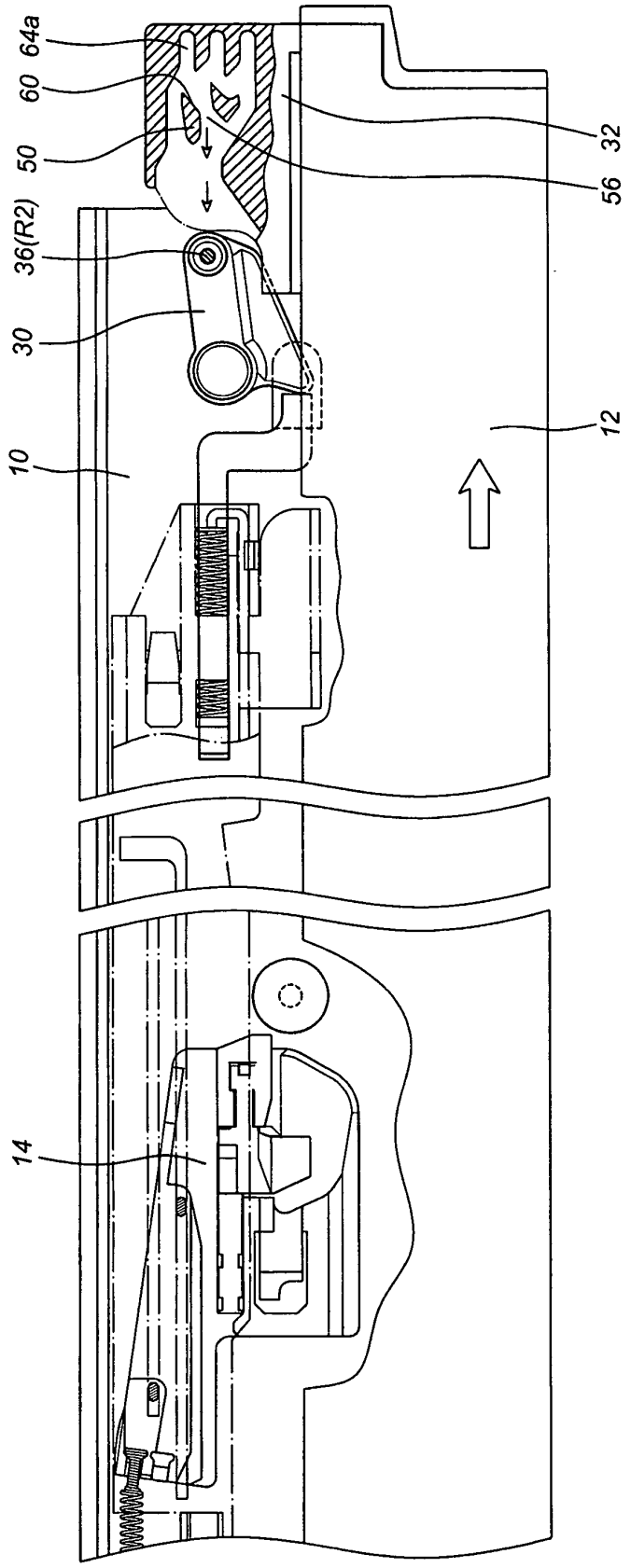

FIG. 7

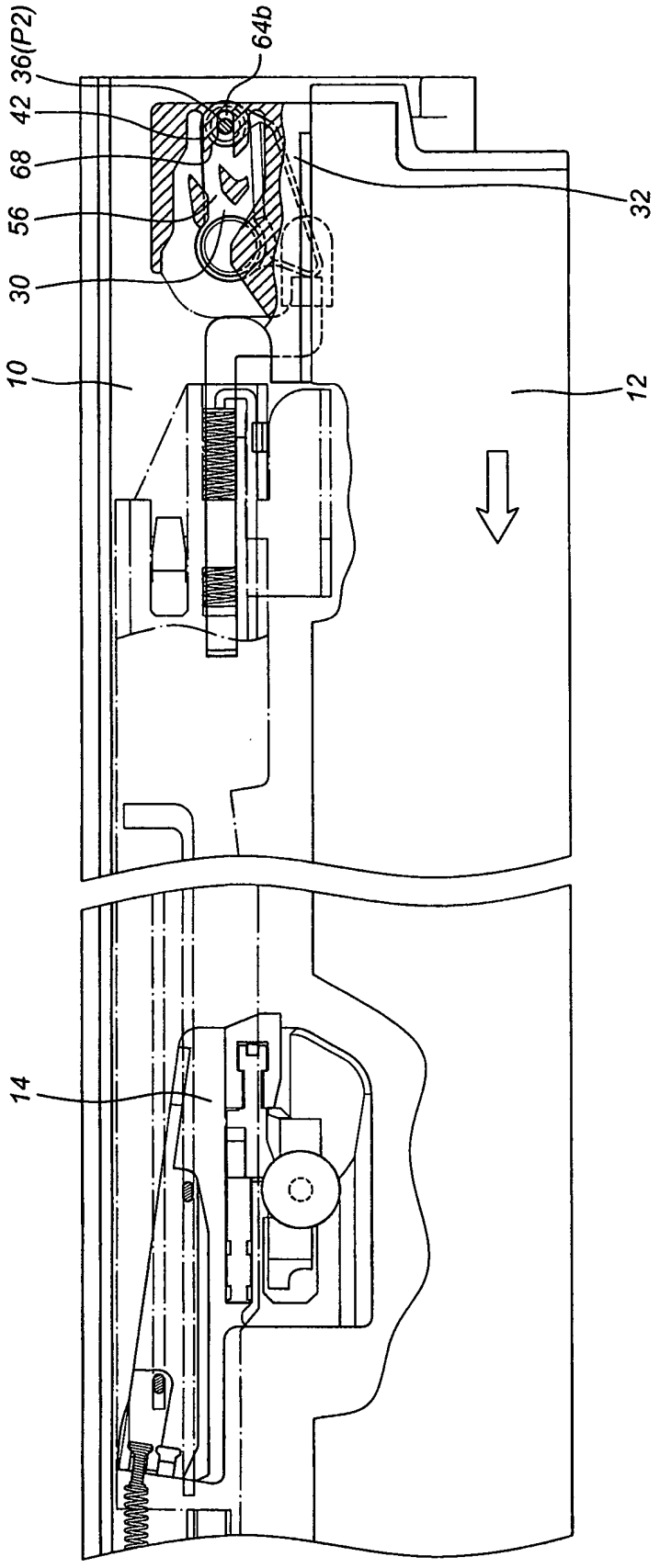

FIG. 8

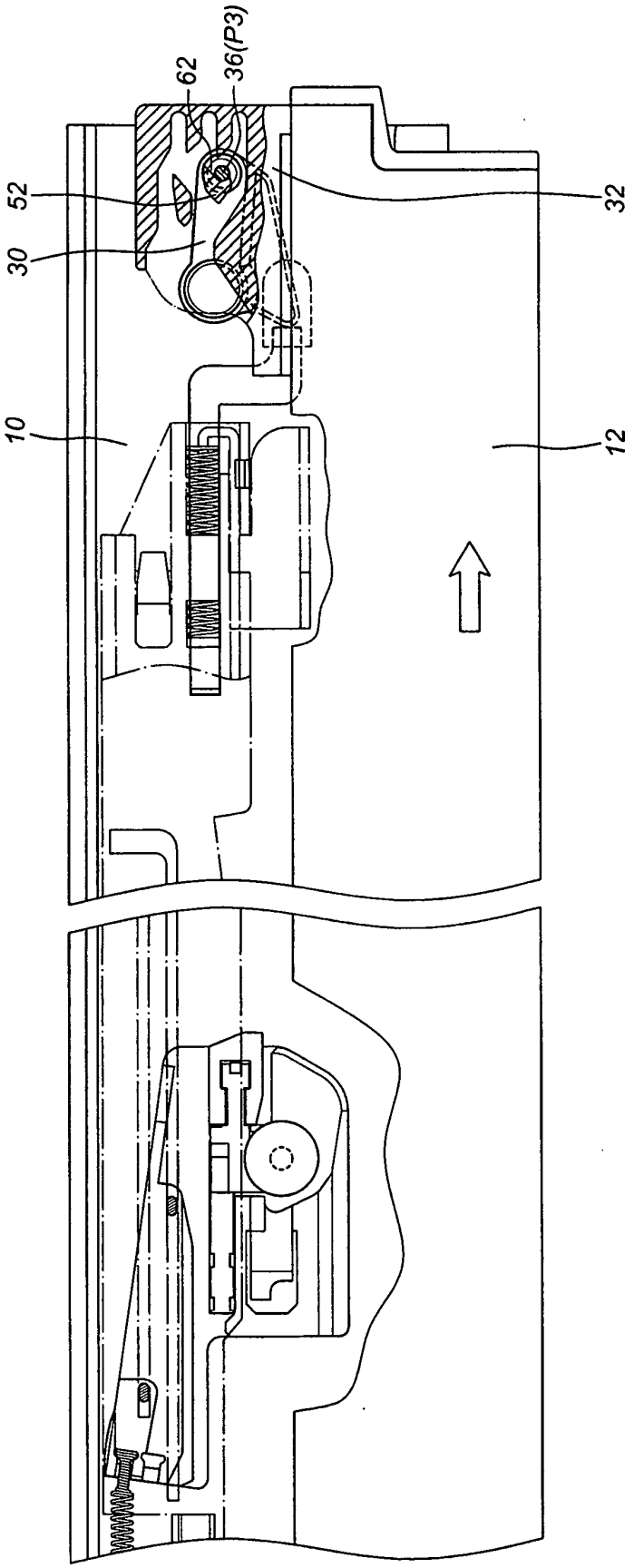

FIG. 9

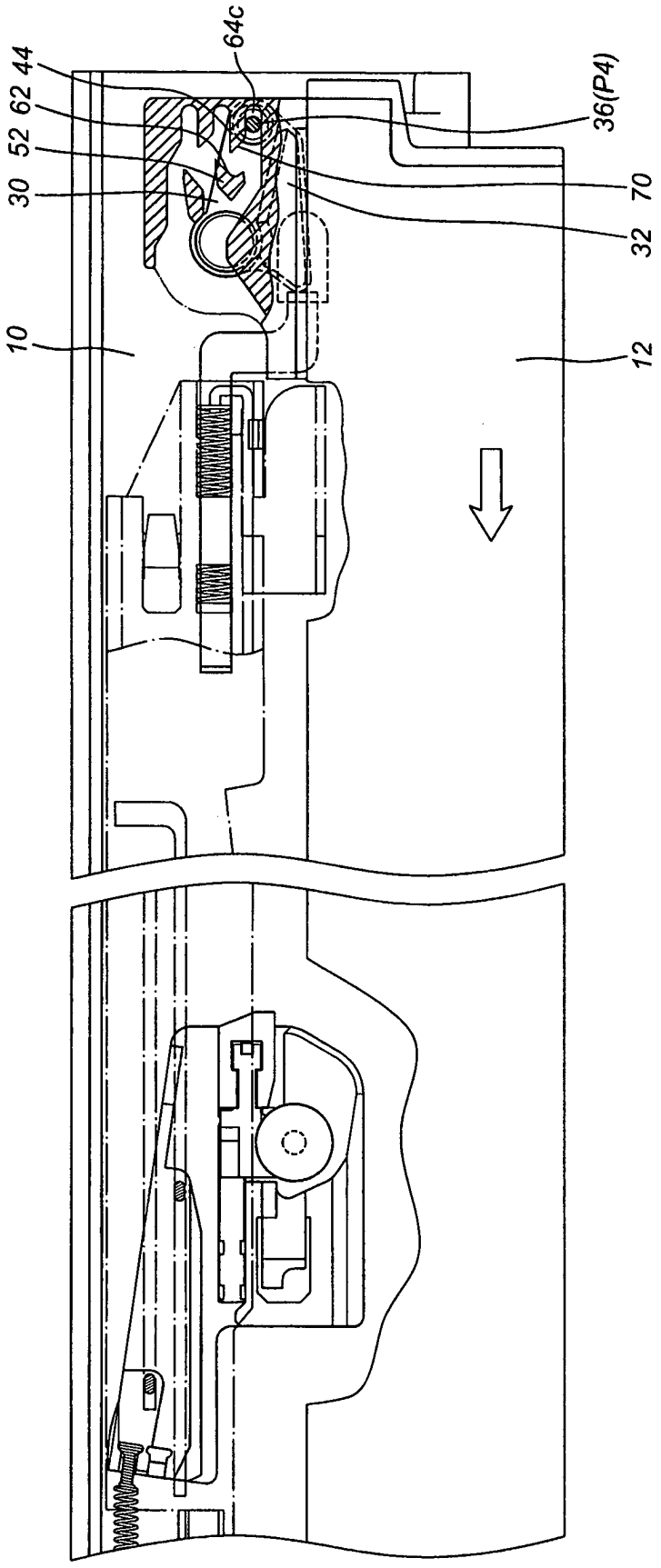

FIG. 10

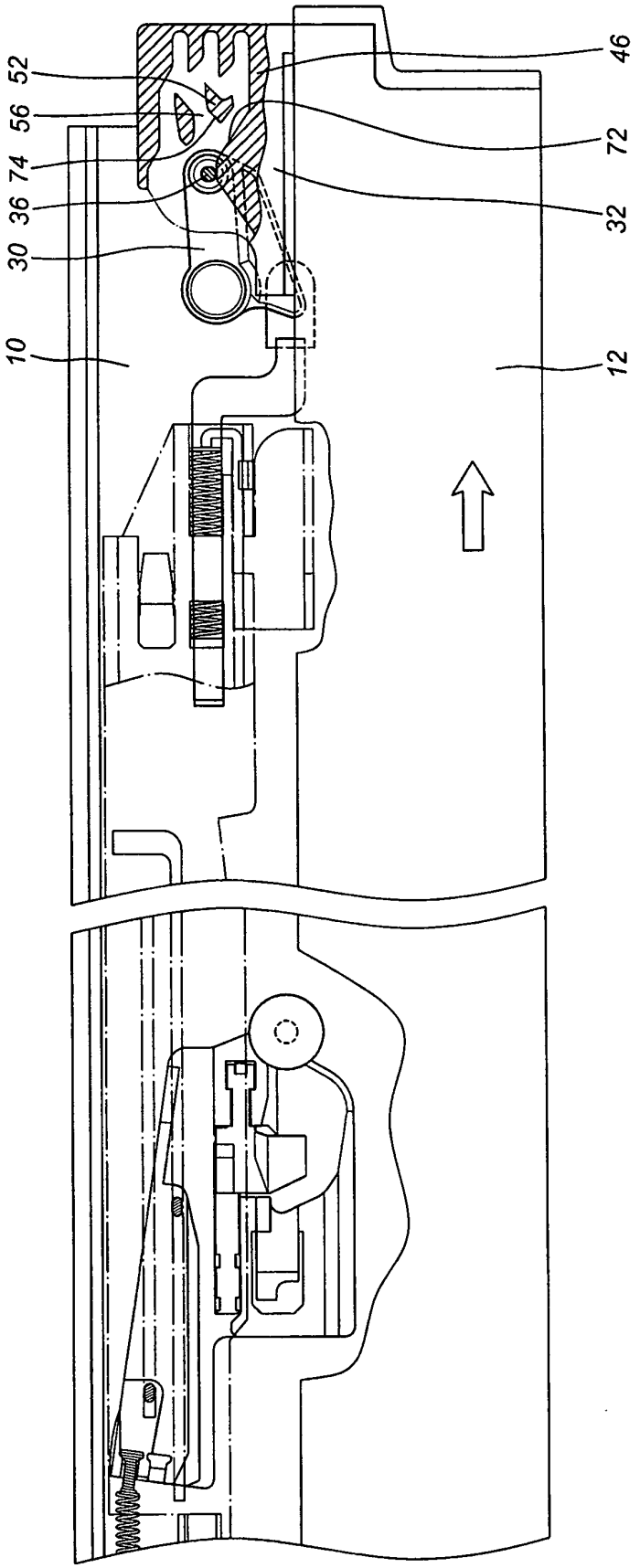

FIG. 11

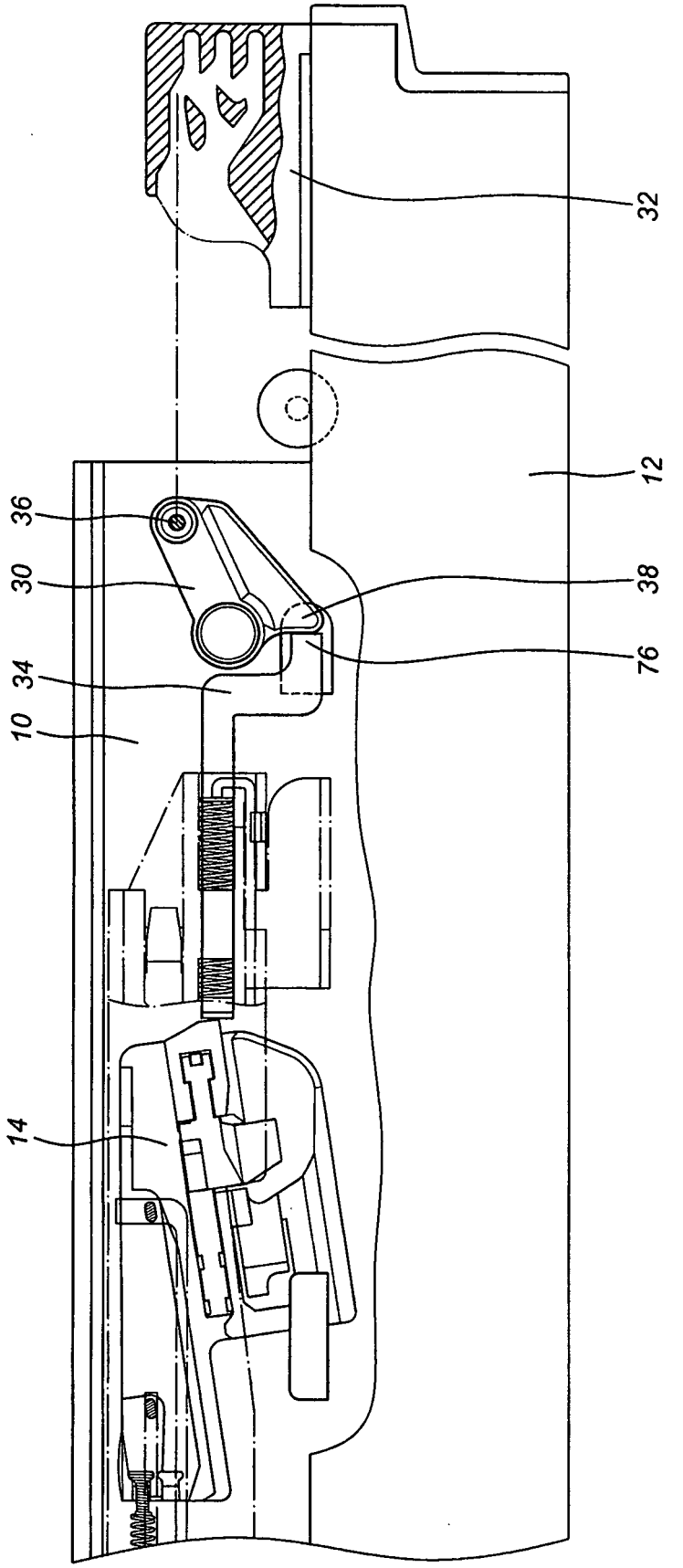

FIG. 12

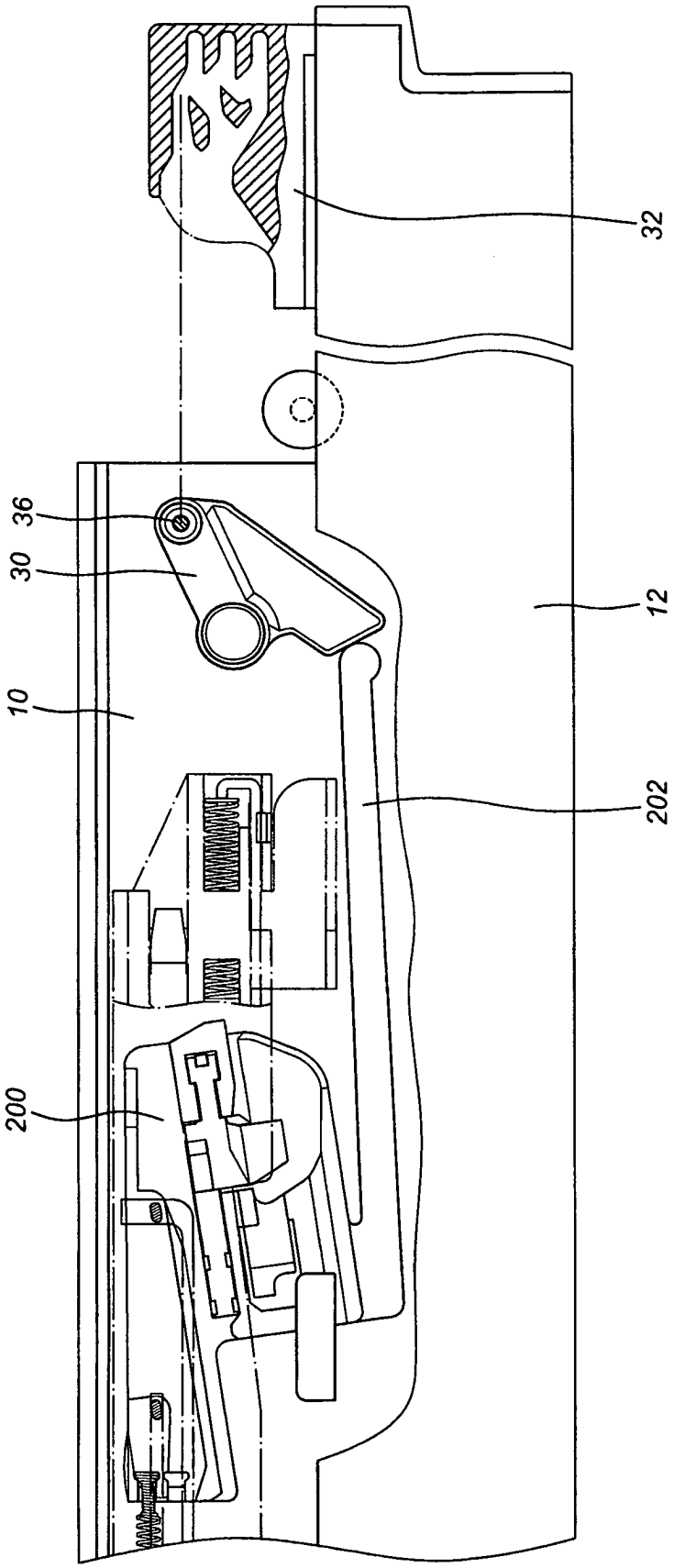

FIG. 13

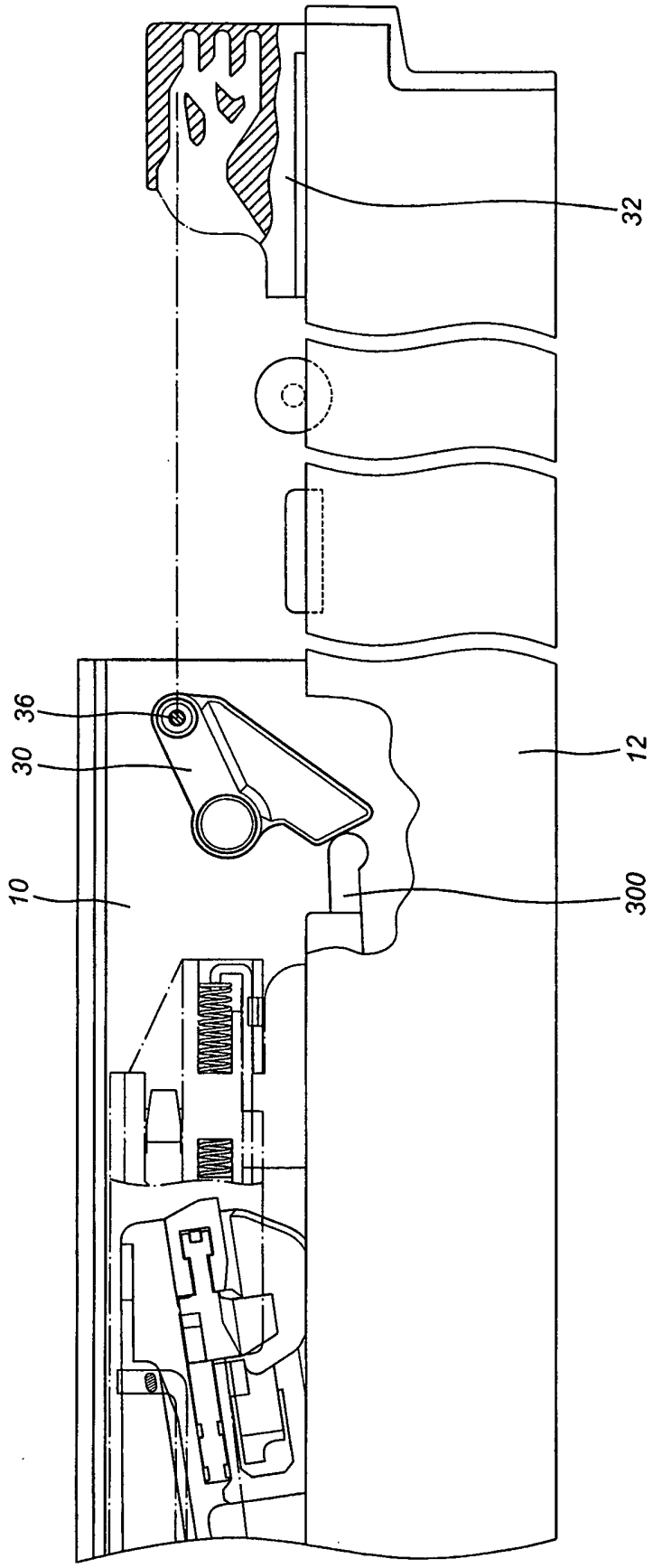

FIG. 14

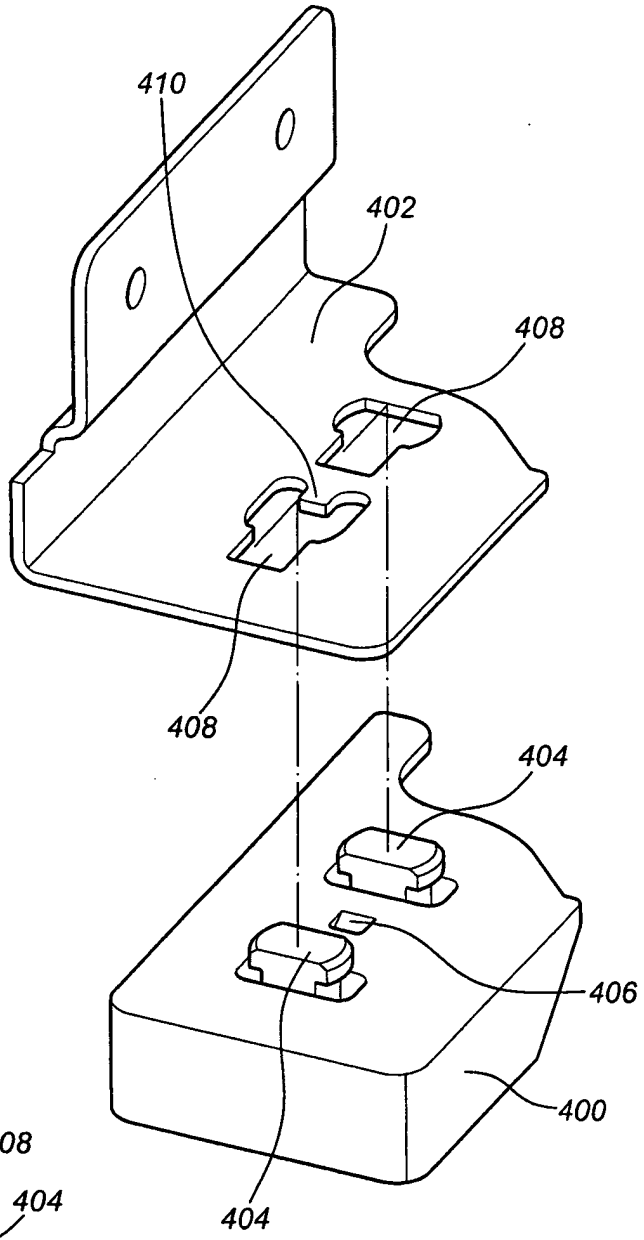

FIG. 15

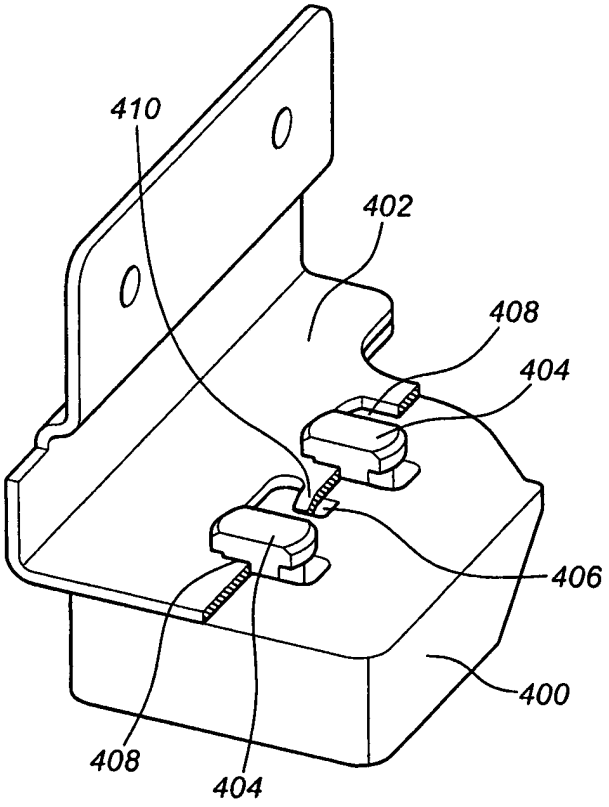

FIG. 16

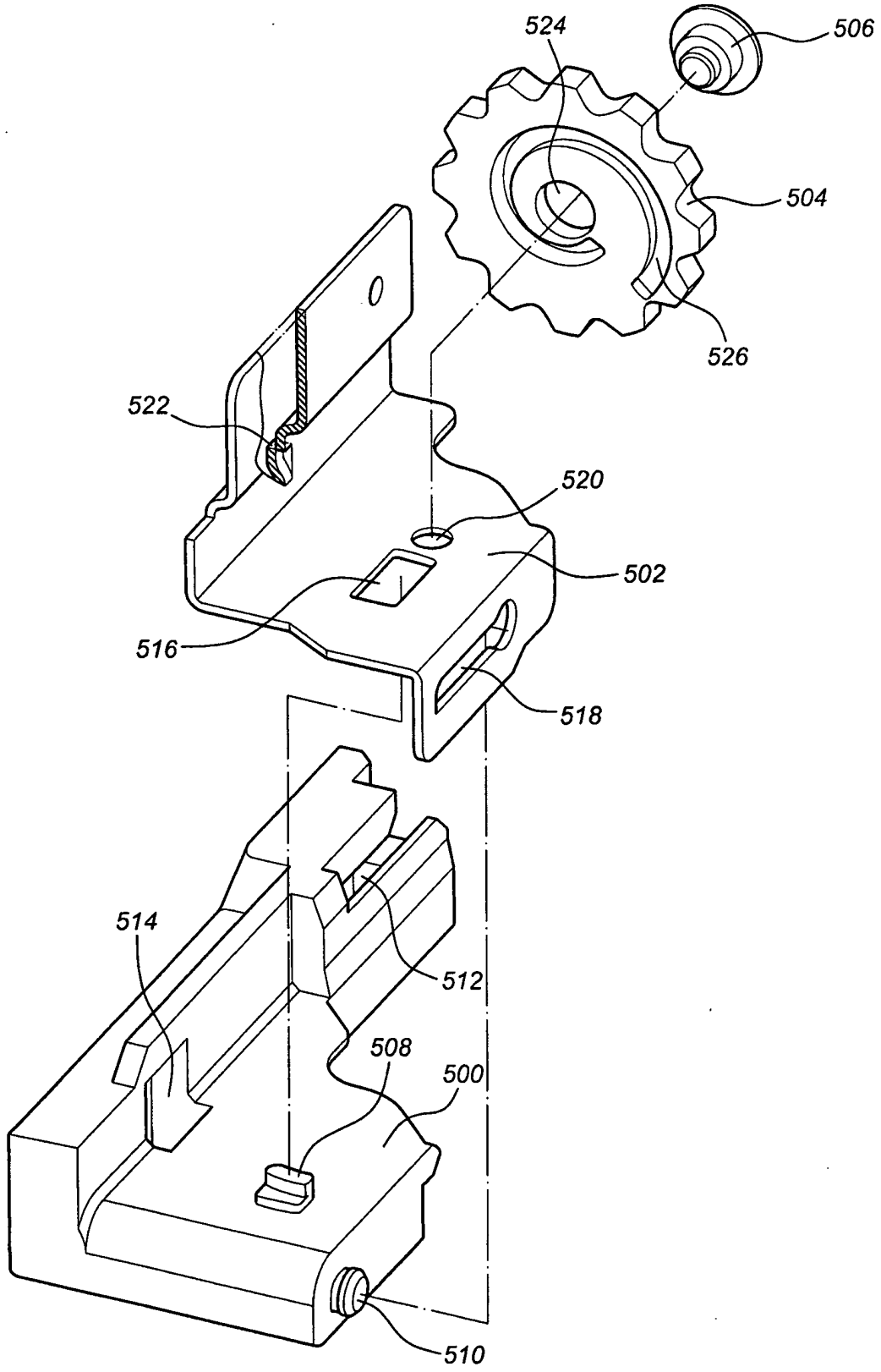

FIG. 17

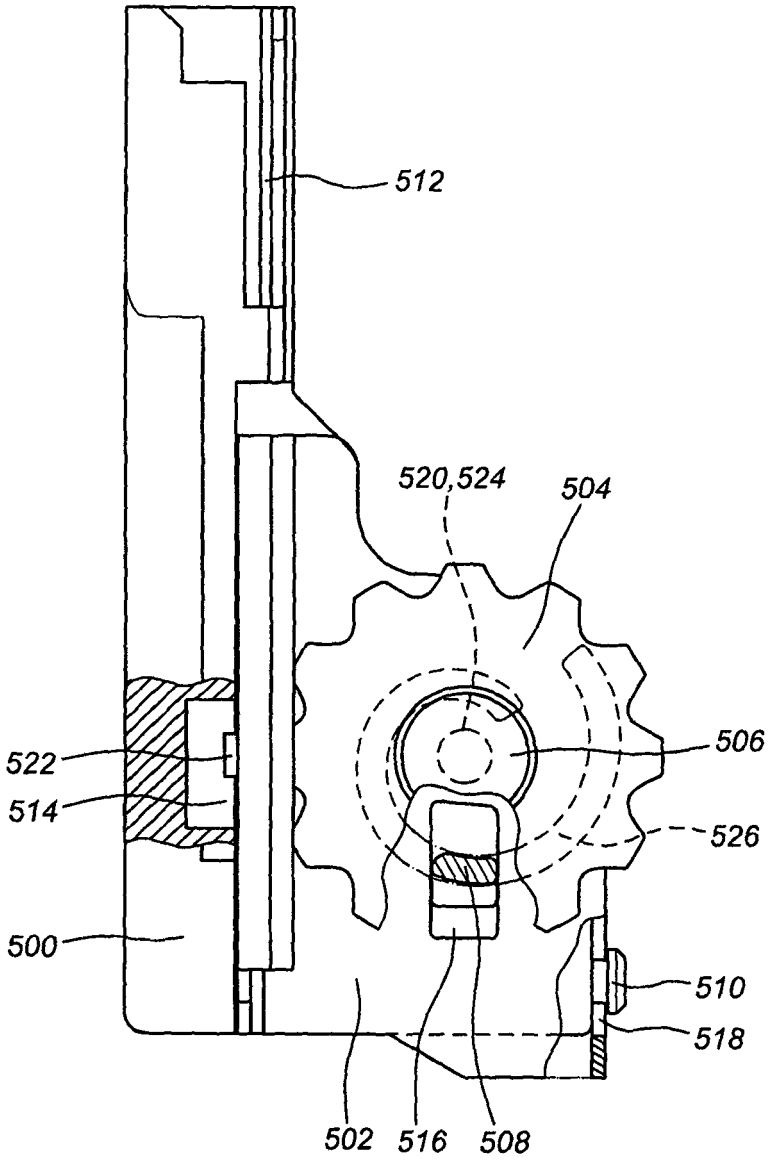

FIG. 18

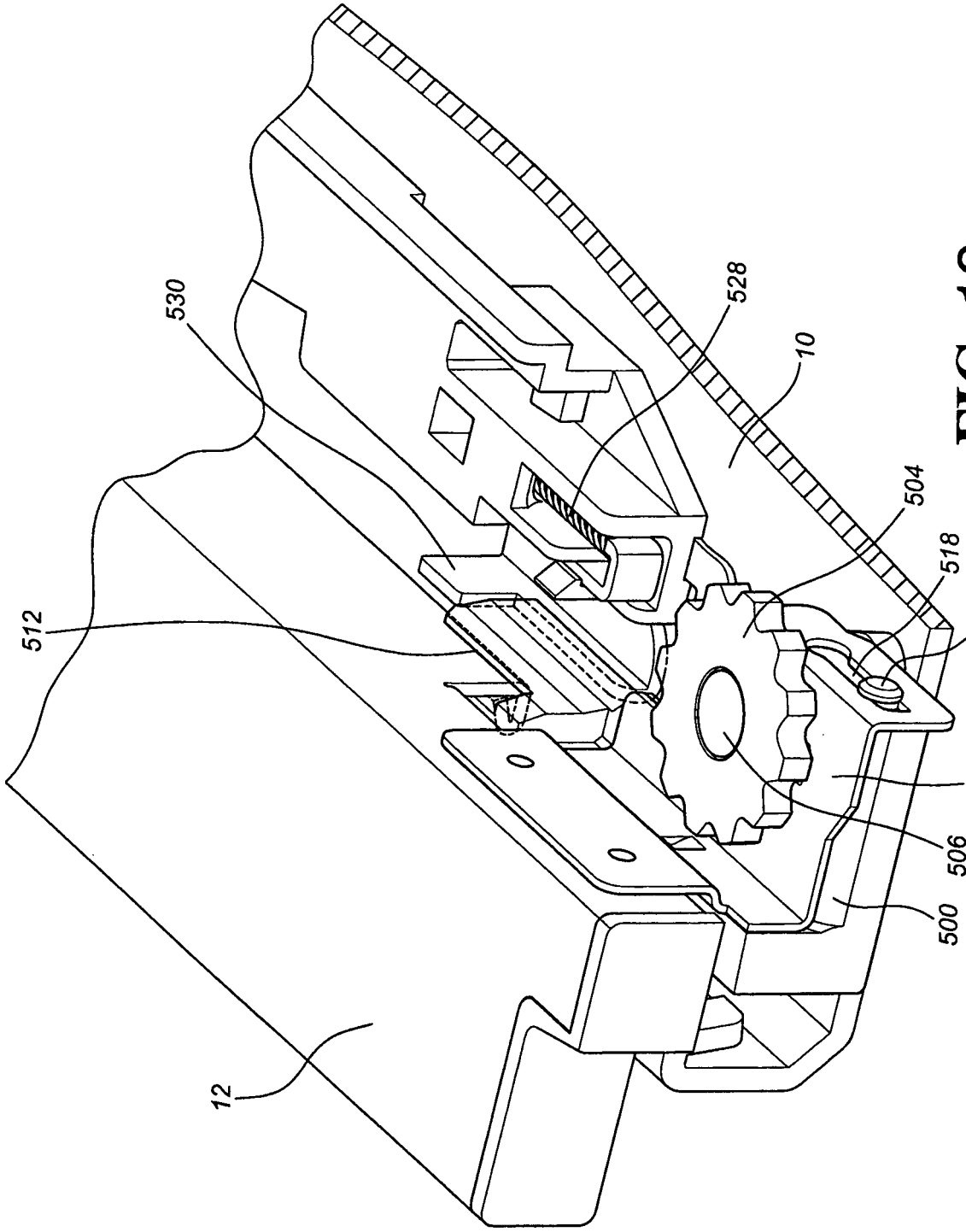

FIG. 19

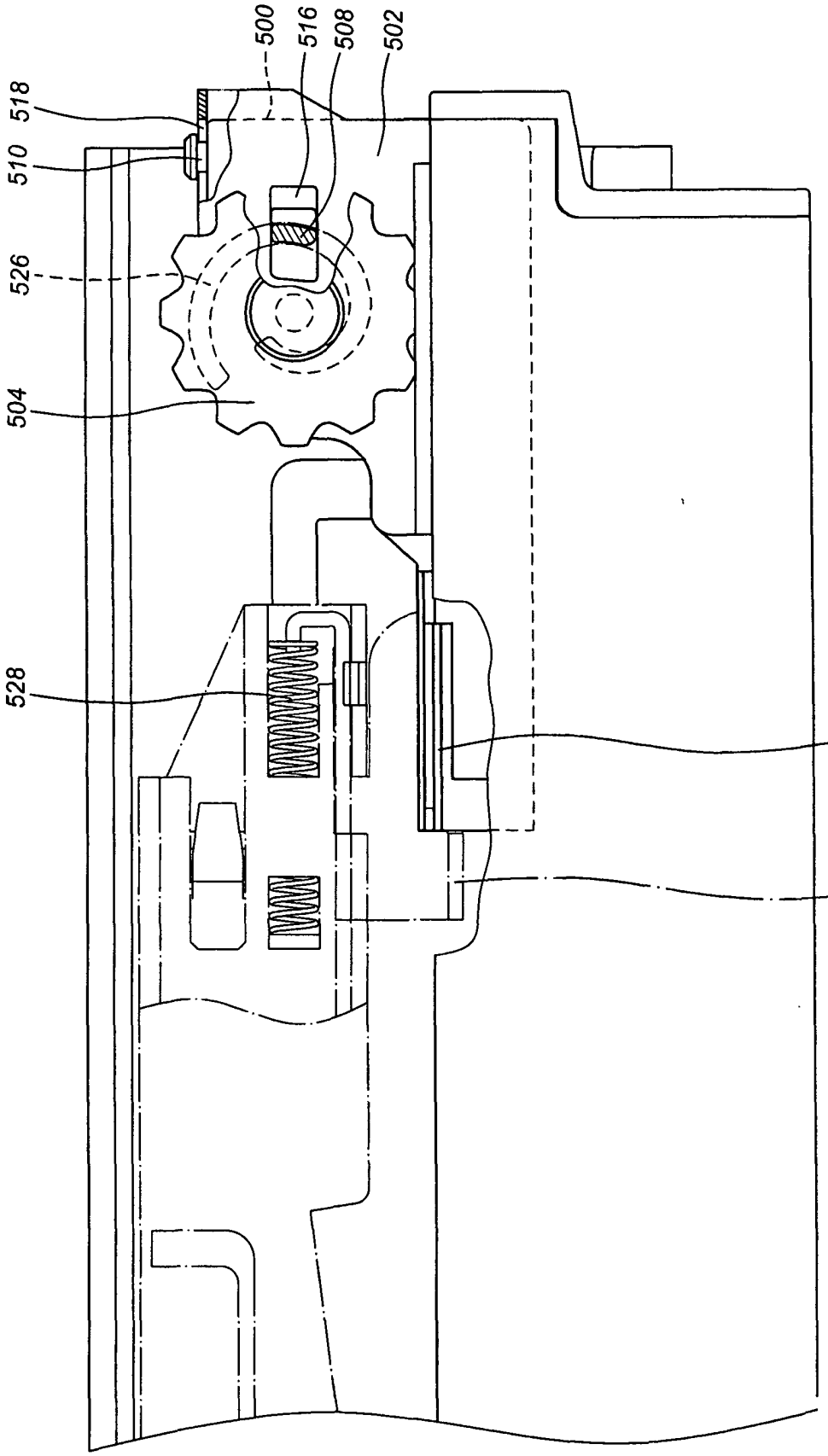

FIG. 20

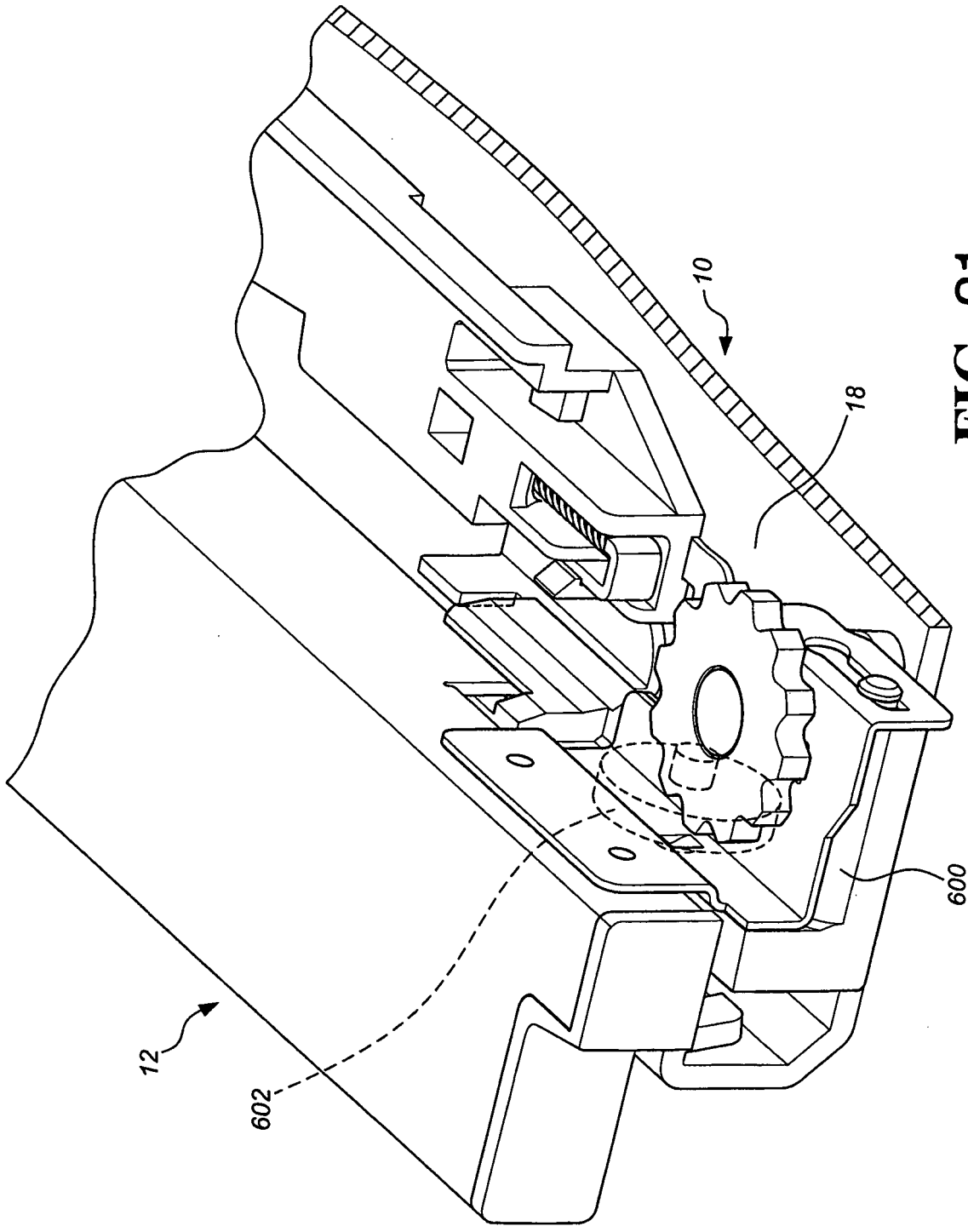

FIG. 21

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5040833 A **[0002]**
- US 7347515 B **[0005]**
- EP 09165988 A **[0019] [0026]**