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(54) **A roof window with an actuator**

(57) An openable top hung roof window (1). The roof window (1) comprises a frame (2) and a sash (3). The sash (3) is pivotally connected to the frame (2) along a hinge 4. The window (1) comprises an elongated member (6) configured for undergoing longitudinal movement when the sash (3) pivots relative to the frame (2). The elongated member (6) is resiliently biased means (7) for balancing the sash (3) in any of its open positions. The roof window (1) is provided with a linear actuator (11) comprising an axially movable actuation member with an extremity (10). The extremity (10) is configured for permanent connection or for releasable engagement with an extremity (9) of the elongated member (6).

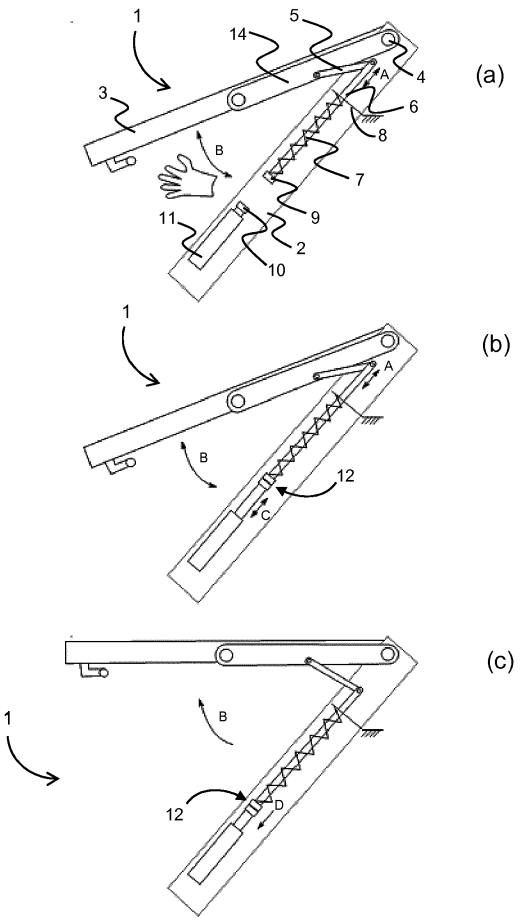


Fig. 2

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## Description

### TECHNICAL FIELD

**[0001]** The present invention relates generally to a roof window, such as top hung roof window and more specifically to such a roof window that can be opened and/or closed by means of an actuator.

### BACKGROUND ART

**[0002]** Windows, for installation in an inclined roof surface, comprise a frame that can be installed and secured to the roof structure and a sash hinged to a top portion of the frame, such that the sash can pivotally move about the hinge relative to the frame are known in the art. Such roof windows can either be manually operated by the user or operated by a controllable drive means such as an electrical motor/actuator.

**[0003]** A pivoting device for a window of the above kind is described in WO 2012/085181 A1. This device comprises a window frame and an extension arm that can be pivoted about a pivot axis. The device comprises a displacement element, movably attached to the extension arm and a drive means, such as an electric motor, that can move the displacement element, and a deflecting lever that connects the frame and the extension arm.

**[0004]** Manual operation of a roof window provided with a controllable drive motor can cause a problem due to the extra load on the movable part caused by the drive mechanism and motor. Thus, for instance, the drive mechanism may comprise a self-locking spindle, in which case the window cannot be manually operated. Instead of using a drive mechanism with a self-locking spindle a non-self-locking drive mechanism may be used, which, however, limits the choice of actuator mechanism and makes the drive mechanism more expensive.

**[0005]** Consequently, it would be advantageous to provide an openable window of the above kind that can be automatically opened and closed, but which can also be manually operated without this requirement limiting the choice of drive means as described above.

### SUMMARY OF THE INVENTION

**[0006]** On this background, it is an object to provide a top hung roof window of the kind described above that can be manually operated and electrically operated.

**[0007]** The object the above and other objects and advantages are obtained by providing a top hung roof window, the window comprising a frame comprising two side members, interconnected by a bottom member and a top member, a sash comprising two side members, interconnected by a bottom member and a top member, the sash being pivotally connected to the frame along the top members by a hinge for pivotal movement of the sash between a closed position and open positions, an elongated member provided at or in one of the side members of the frame and extending substantially parallel therewith, and a link mechanism operably connecting the sash to the elongated member so that the elongated member is longitudinally displaced when the sash pivots relative to the frame, the elongated member being resiliently biased for balancing the sash in any open position, the window is provided with a linear actuator that comprises a static part and a linearly movable part, the static part is secured to the frame with the linearly movable part aligned with the elongated member and with an extremity of the linearly movable part permanently connected or releasably engaged with an opposing extremity of the elongated member.

**[0008]** By providing a linear actuator that is arranged in line with the elongated member, a simple and inexpensive arrangement for motorized actuation of the sash is provided. The solution allows for the linear actuator to either form an integral part of the window as it leaves the factory or be subsequently provided to an already existing window as an ad-on unit.

**[0009]** By providing a permanent connection between the linear actuator and the elongated member a simple and reliable solution is provided that requires the actuator to be non-self-locking. By providing an automatically releasable connection between the linear actuator and the elongated member an actuator that is self-locking can be used whilst the sash can still ne manually moved.

**[0010]** In an embodiment the extremity of the linearly movable part is permanently connected with the opposing extremity of the elongated member, and wherein the linear actuator is not self-locking and thus movement of the sash forces movement of the linear actuator.

**[0011]** In an embodiment the extremity of the movable part of the linear actuator is provided with a first part of releasable coupling, the first part being configured for releasable attachment to a cooperating second part of the coupling, the second part being provided on the extremity of the elongated member.

**[0012]** In an embodiment the first part and the second part of the releasable coupling are configured to automatically engage one another when they from a separated state are pushed against one another, and wherein the first part and the second part of the releasable coupling are configured to disengage one another when the first part and the second part are in an engaged state and the first part and the second part are pushed together with a force exceeding a pushing force threshold.

**[0013]** In an embodiment the first part and the second part the coupling are configured to automatically engage one another when they abut with one another and wherein the first part and the second part of the releasable coupling are configured to disengage from one another when a force pulling them apart exceeds a pulling force threshold.

**[0014]** In an embodiment the extremity of the elongated member is provided with a first part of a releasable coupling configured for releasable attachment to a cooperating second part of the releasable coupling provided,

the second part being provided on the extremity of the linear actuator.

**[0015]** In an embodiment the first part is configured for reception of the second part and wherein the first part is closed at one longitudinal end and open at an opposing longitudinal end through which opposing longitudinal end the second part is received, and wherein the first part comprises first retaining means configured for retaining the second part upon introduction hereof in the first part thereby establishing releasable connection between the first part and the second part.

**[0016]** In an embodiment the releasable coupling comprises a first part open at one longitudinal end and being provided with an internal channel comprising a first channel section connecting the open end with a first stop position, from which a second channel section leads to a second stop position, from which a third channel section leads to a third stop position from which a fourth channel section leads to the opening of the first part, and wherein the first stop position and the third stop position are provided on inner surfaces of the first part facing away from the opening and the second stop position is provided on an inner surface of the first part closer to the opening than the first and second stop positions, and a second part provided with an attachment member configured to be able to pass through the internal channel of the first part, the attachment member being movable under tension such that it can follow the internal channel from the opening through the channel sections and back to the opening.

**[0017]** In an embodiment the releasable coupling comprises a first part comprising a cylindrical housing open at one longitudinal end for reception of a second part of the releasable coupling, where the housing longitudinally opposite the open end is provided with a first rotation effecting member fixed to the housing and a second rotation effecting member provided in the housing opposite the first rotation effecting member, the second rotation effecting member being configured for rotational and longitudinal movement within the housing, wherein first retaining means configured for retaining the second part is attached to the third rotation effecting member and moves together herewith, the housing comprising an interior space longitudinally between the first and third rotation effecting members, which space comprises a third rotation effecting member that is free to undergo rotational and longitudinal movement in the space, where the first rotation effecting member comprises teeth facing similar teeth provided on the third rotation effecting member and facing the first rotation effecting member, and where the third rotation effecting member comprises teeth facing the third rotation effecting member and configured for engagement with indentations on the third rotation effecting member facing the third rotation effecting member, where the third rotation effecting member in the direction towards the opening is connected with a cylindrical portion comprising retaining bodies, and where the housing and the cylindrical portion are configured such that a rotation of the cylindrical portion makes the retaining bodies undergo radial movement, thereby creating a space within which space an extended portion of a second part of the releasable coupling is retained by the retaining bodies, and a second part comprising a longitudinally extending shaft portion at the end hereof provided with a radially extended portion configured for insertion in the open end of the housing of the first part.

**[0018]** Further objects, features, advantages and properties of the top hung roof window according to the invention will become apparent from the detailed description.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0019]** In the following detailed portion of the present description, the roof window will be explained in more detail with reference to the example embodiments shown in the drawings, in which

Fig. 1 shows a schematic perspective view of a prior art top hung roof window;

Fig. 2a, 2b and 2c show a schematic plane side view of a first example embodiment of an openable roof window provided with a linear actuator illustrating the principle of the invention;

Fig. 3 shows a schematic cross sectional view of a first embodiment of a releasable coupling; and

Figs. 4a and 4b show a schematic cross-sectional view of a second embodiment of the releasable coupling.

## DETAILED DESCRIPTION

**[0020]** With reference to Fig. 1 there is shown a schematic elevated view of a prior art roof window generally indicated by reference numeral 1. The window 1 has a frame structure 2 with side members 2', a bottom member 2" and a top member 2"' (the top member 2"' is not visible in figure 1). The bottom member 2" and top member 2"' interconnect the side members 2' to form a rectangular frame that defines an opening. The window 1 is also provided with a sash structure 3 with side members 3, a bottom member 3" mand a top member 3"'. The bottom member 3" hand top member 3" interconnect the side members 3" to form a rectangular sash 3 that defines an opening that is filled with a window pane, such as double glazing or another form of glazing. The frame members 2' 2" 2"' and the sash members 3' 3" 3"' can for example be wooden members, metal profiles, plastic (polymeric) material members or combinations thereof.

**[0021]** The frame 2 and the sash 3 are connected to each other at the top member of the frame 2 by a suitable hinge 4. The sash 3 can undergo a pivotal movement relative to the frame 2 about the hinge 4 as indicated by

the arrow B in figure 1 between a closed position and open positions.

**[0022]** The sash 3 connects in this embodiment to the hinge 4 via two arms 14 that are rigidly connected to the side members 3'. As shown in Figure 2, the arms 14 project from the sash 3 so as to reach the hinge 4.

**[0023]** A link arm 5 is pivotally connected with one of its longitudinal ends to the arm 14 at a position at a distance from the hinge 4. In an embodiment (not shown) the longitudinal end of the arm 5 is pivotally connected directly to the side member 3'. The other longitudinal end of the link arm 5 is pivotally connected to an extremity of an elongated member 6. The elongated member 6 is in an embodiment a rod or bar, preferably a metal rod or bar.

**[0024]** The elongated member 6 is arranged in or at one of the side members 2'2of the frame 2 and extends in parallel with the side ember 2' concerned. The elongated member 6 is arranged to be longitudinally displaceable and the elongated member 6 is guided in its movement in- or along the side member 2' by suitable guide means such as guide surfaces or guide channels or openings as is apparent for one skilled in the art. A part of the guide means can be formed by a suitable sized opening in a stationary support plate 8.

**[0025]** The link arrangement between the sash 3 and the elongated member 6 with the link arm 5 causes the elongated member 6 to move towards the bottom of the roof window 1 when the sash 3 makes a pivotal movement relative to the frame 2 in an opening direction and vice versa, as indicated by the arrows A and B.

**[0026]** The elongated member 6 is biased towards the bottom of the roof window 1 by a biasing member such as for instance a helical wire spring 7. In an embodiment helical wire spring 7 is a compression spring and encircles a portion of the elongated member 6 and one end of the helical wire spring 7 abuts with the stationary support plate 8 and the other end of the helical wire spring 7 abuts with an enlarged diameter extremity 9 of the elongated member 6. In an embodiment the characteristic of the biasing member 7 is chosen such that the sash 3 is substantially balanced in any open position. Further, in an embodiment braking or damping means can be provided, to ensure that the sash can be kept in a stable open position without being affected by wind or other forces that may have an impact on the sash 3. These braking or damping means can e.g. be provided in the opening in the static support plate 8 through which the elongated member 6 passes. These can be passive damping/breaking means or active breaking/damping means that apply a braking/dampening force that is dependent on the spring force, i.e. dependent on the position of the sash 3.

**[0027]** With reference to figures 2a, 2b and 2c there is shown a schematic plane side view of a first example embodiment of an openable roof window 1. Features of the embodiment shown in figures 2a, 2b and 2c that are identical to those shown and described in figure 1 are designated by the same reference numbers as in figure 1.

**[0028]** The window 1 is provided a linear actuator 11 with an operable extremity 10. The linear actuator 11 is secured in or at the frame member 2' and the linear actuator 11 is arranged in line with the elongated member 6. The linear actuator 11 is provided at the bottom end of the roof window 1 and has a static part secured to the frame 2 and a movable part that protrudes from the static housing. Thus, the linear actuator 11 is provided substantially coaxially with the elongated member 6 such that an extremity 10 of the free end of the movable part of the linear actuator 11 faces an extremity 9 of the elongated member 6. These extremities will be described in greater detail below. The linear actuator 11 is in an embodiment an electrically operated and controlled actuator that comprises an electric rotary drive motor (not shown) and a mechanism to translate the rotary movement of the electric drive motor into a linear movement. In an embodiment the mechanism comprises a nut and spindle arrangement.

**[0029]** When starting from the position shown in Figure 2a, and when the linear actuator 11 is operated to extent itself, the extremity 10 of the movable part of the linear actuator 11 moves towards the extremity 9 of the elongated member 6, as indicated by the arrow C and eventually reaches the extremity 9 of the elongated member 6 as shown in figure 2b. When the extremity 10 of the actuator 11 gets into abuts (at the position indicated by reference numeral 12) with the extremity 9 of the elongated member 6 (or moves into the vicinity hereof) the extremity 10 of the actuator 11 automatically establishes releasable attachment to the extremity 9 of the elongated member 6. The linear actuator 11 can now apply a pull load and a push load to the elongated member 6 and thereby move the sash 3 to a desired pivotal position relative to the frame 2 as indicated by the arrow D in figure 2c. When this desired position is reached, the extremity 10 of the actuator 11 is released from the extremity 9 of the elongated member 6 and the operable extremity 10 of the actuator 11 is returned to its original retracted position as shown in figure 2a. In this state of the roof window it is possible for a user to operate the window manually without needing to move the linear actuator.

**[0030]** Electronic control means (not shown) that control the operation of the linear actuator 11 are configured to cause the linear actuator to move such that it engages and disengages the elongated ember 6.

**[0031]** The disengagement of the releasable coupling is in an embodiment achieved by a pushing force that exceeds a pushing force threshold, i.e. the releasable coupling is arranged to disengage when the pushing force from the linear actuator 11 on to the elongated member 6 exceeds a given pushing force threshold. In another embodiment the disengagement of the releasable coupling is based on a pulling force exceeding a pulling force threshold, i.e. the releasable coupling is arranged to disengage when the pulling force from the linear actuator 11 to the elongated member 6 exceeds a

given pushing force threshold.

**[0032]** With reference to figure 3 there is shown a schematic cross sectional view of a first embodiment of a releasable coupling. The coupling comprises a first part 13 and a second, mating part 19. The first part 13 can be provided at the longitudinal end of the elongated member 6 facing the linear actuator 11 and the second part 19 can be provided oppositely on the operational end of the linear actuator 11 facing the elongated member 6. A provision of the first part 13 on the operational end of the linear actuator 11 and the second part 19 on the longitudinal end of the elongated member 6 would also be possible as an alternative.

**[0033]** The first part 13 of the coupling according to a first embodiment comprises a body portion 14', 14" open at one longitudinal end 17 for reception of an extremity 23 of the second part 19 of the coupling. The body portion comprises an inclined wall member 14", along the inclined surface 16 of which the extremity 23 of the second part 19 can slide, when the second part 19 is pushed into the first part 13 as indicated by the arrow G. When the second part is pushed into the first part, the extremity 23 follows the path of movement schematically indicated by the arrows $E_1$, $E_2$ and $E_3$ through a first channel portion 18. Following the path of movement indicated by arrows $E_1$, $E_2$ and $E_3$ the extremity 23 arrives at a first stop position indicated by 15 and a further movement of the extremity 23 in the direction of arrow G will push the first part 13 in this direction. When the direction of movement of the second part 19 is reversed (the opposite direction of arrow G) the extremity 23 passes through a second channel portion 19 and is received in a second stop position 20 of the body portion 14" and a further movement of the extremity 23 will result in the first part 13 being pulled in the direction opposite to the arrow G, i.e. back towards the linear actuator 11. If the direction of movement of the extremity 23 is again reversed (in the direction of arrow G) the path of movement indicated by arrow $E_4$ is followed through a third channel portion 21 and the first part 13 is again pushed away from the linear actuator 11. A final reversal of the direction of movement of the extremity 23 will make this portion move in the direction of arrow E5 through a fourth channel portion 22 and the second part 19 of the coupling will become released from the first part of the coupling. The proper movement through the first to fourth channel along the arrows E1 through E5 is facilitated by means of the spring 26 that together with the provision of the extremity 24 on an arm 25 with a pivot axle 27 allows the desired lateral pivotal movement of the extremity 24 as shown in figure 3.

**[0034]** With reference to figures 4a and 4b there is shown a schematic cross sectional view of a second embodiment of a releasable coupling according to the invention. This embodiment comprises a first part generally indicated by reference numeral 28 that can either be provided at the extremity 9 of the elongated member 6 or, alternatively, at the operational end 10 of the linear actuator 11. The first part 28 is configured to go into releasable engagement with a mating extremity 42 provided at the operational end 10 of the linear actuator 11, if the first part 28 is provided on the extremity 9 of the elongated member 6, or the extremity 9 of the elongated member 6, if the first part 28 is provided on the operable end 10 of the linear actuator 11.

**[0035]** The first part 28 comprises a cylindrical housing 29 open at least at one longitudinal end 43 for reception of the mating extremity 42. Longitudinally opposite the open end 43 there is inside the housing 29 provided a first rotation effecting member 34 that on the face hereof facing the opening 43 is provided with a cylindrical tooth ring comprising a plurality of teeth having a inclined surface 30 facing the open end 43. The first rotation effecting member 34 is fixed relative to the housing 29.

**[0036]** Longitudinally opposite the first rotating effecting member 34 towards the open end 43 there is provided a cylindrical second rotation effecting member 39, such that a cylindrical space 40 is formed between the first and second rotation effecting members 34 and 39. The second rotation effecting member 39 is longitudinally facing the first rotation effecting member 34 provided with a cylindrical tooth ring comprising a plurality of teeth 36. Between the first and second rotation effecting members 34 and 39 is a third rotation effecting member 32.

**[0037]** Attached to the third rotation effecting member 32 there is provided a cylindrical portion 44 that is provided with channel portions 36 configured to accommodate spherical bodies 35 herein. The housing 29 is in the inner circumferential surface provided with recesses 45 corresponding to the spherical bodies 35.

**[0038]** In the space 40 there is between the first rotation effecting member 34 and the second rotation effecting member 39 provided a third rotation effecting member 32. The third rotation effecting member 32 can undergo rotation about a longitudinal axis X of the housing 29 as well as longitudinal movement along this axis. At the longitudinal end hereof facing the first rotation effecting member 34 there is provided a cylindrical tooth ring comprising teeth provided with an inclined portion 33 that matches the inclined portion 30 of the tooth ring on the first member 34. At the opposite longitudinal end of the third rotation effecting member 32 there is provided a ring of indentations 31 that matches the teeth 36 provided on the second rotation effecting member 39.

**[0039]** The second part of a releasable coupling according to the embodiment shown in figures 4a and 4b comprises a shaft portion 41 provided with a radially extended extremity 42 at the longitudinal end facing the first part 28 of the releasable coupling. It is understood that the shaft portion 41 can be either the elongated member 6 itself or, alternatively, the operable end of 10 of the linear actuator 11. The extended extremity 42 is configured such that it can pass the spherical bodies 35 into the space 44 of the first part 28 of the coupling, when the spherical bodies 35 are positioned adjacent to the recesses 45. When the second part 41, 42 of the coupling continues to move in the direction of the arrow G the

radially extended extremity 42 affects the third rotation effecting member 32 (connection not shown), whereby the inclined portions 33 of the teeth on the third rotation effecting member 32 will slide along the corresponding inclined portions on the teeth on the first rotation effecting member 34. At this stage a spring (not shown) will cause the teeth 36 on the second rotation effecting member 39 are in engagement with the corresponding indentations 31 on the third rotating effecting member 32, and as the first rotation effecting member 34 is fixed to the housing 29 of the first part 28 of the coupling, the cylindrical portion 37 that is attached to the third rotation effecting member 32 will undergo rotation about the longitudinal axis X, whereby the spherical bodies 35 will be forced out of the corresponding recesses 45 in the radial direction towards the longitudinal axis X and thereby lock the extended portion 42 of the second part 41, 42 to the first part 28 of the coupling. Thus, when the second part 41, 42 moves in the opposite direction as that indicated by the arrow G in figure 4b, the first and second part 28 and 41, 42 of the coupling will move together. In this stage of the motion, there will be no engagement between the first and the third rotation effecting members 34 and 32 as shown in figure 4b.

**[0040]** When the second part 41, 42 of the coupling is subsequently pushed towards the first part 28, engagement between the first and the third rotation effecting members 34 and 32 will again be established, with the result that the spherical bodies 35 will become positioned adjacent respective recesses 45, thereby enabling the first and second parts 28 and 41, 42 to become detached from each other.

**[0041]** Although the teaching of this application has been described in detail for purpose of illustration, it is understood that such detail is solely for that purpose, and variations can be made therein by those skilled in the art without departing from the scope of the teaching of this application.

**[0042]** For example, in the detailed description above there are described alternative embodiments of the releasable coupling means. It is however understood that there are also other embodiments of the releasable coupling that are possible and fall within the scope of protection defined by the claims. Such other embodiments could for instance comprise electro-magnetic couplings. Or the releasable coupling means could be operated by a second electric actuator.

**[0043]** The term "comprising" as used in the claims does not exclude other elements or steps. The term "a" or "an" as used in the claims does not exclude a plurality.

## Claims

**1.** A top hung roof window, said window (1) comprising:

a frame (2) comprising two side members (2'), interconnected by a bottom member (2") and a top member (2"'),

a sash (3) comprising two side members (3'), interconnected by a bottom member (3") and a top member (3"'),

the sash (3) being pivotally connected to the frame (2) along said top members (2"', 3"') by a hinge (4) for pivotal movement of the sash (3) between a closed position and open positions,

an elongated member (6) provided at or in one of said side members (2') of the frame (2) and extending substantially parallel therewith, and

a link mechanism (5) operably connecting said sash (3) to said elongated member (6) so that said elongated member is longitudinally displaced when the sash (3) pivots relative to the frame (2),

said elongated member (6) being resiliently biased for balancing the sash (3) in any open position,

**characterized in that** said window (1) is provided with a linear actuator (11) that comprises a static part and a linearly movable part, said static part is secured to said frame (2) with said linearly movable part aligned with said elongated member (6) and with an extremity (10) of said linearly movable part permanently connected or releasably engaged with an opposing extremity (9) of said elongated member (6).

**2.** A roof window according to claim 1, wherein said extremity (10) of said linearly movable part is permanently connected with said opposing extremity (9) of said elongated member(6), and wherein said linear actuator (11) is not self-locking and thus movement of the sash (3) forces movement of said linear actuator (11).

**3.** A roof window according to claim 1 or 2, wherein said extremity (10) of the movable part of said linear actuator (11) is provided with a first part (13, 28) of releasable coupling, said first part being configured for releasable attachment to a cooperating second part (19, 41, 42) of said coupling, said second part (19, 41, 42) being provided on the extremity (9) of said elongated member (6).

**4.** A roof window according to claim 3, wherein said first part (13, 28) and said second part (19, 41, 42) of said releasable coupling are configured to automatically engage one another when they from a separated state are pushed against one another, and wherein said first part (13, 28) and said second part (19, 41, 42) of said releasable coupling are configured to disengage one another when said first part (13, 28) and said second part (19, 41, 42) are in an engaged state and said first part (13, 28) and said second part (19, 41, 42) are pushed together with a force exceeding a pushing force threshold.

5. A roof window according to claim 3, wherein said first part (13, 28) and said second part (19, 41, 42) of said coupling are configured to automatically engage one another when they abut with one another and wherein said first part (13, 28) and said second part (19, 41, 42) of said releasable coupling are configured to disengage from one another when a force pulling them apart exceeds a pulling force threshold.

6. A roof window according to any one of claims 1 to 5, wherein said extremity (9) of said elongated member (6) is provided with a first part (13, 28) of a releasable coupling configured for releasable attachment to a cooperating second part (19; 41, 42) of said releasable coupling provided, said second part (19; 41, 42) being provided on said extremity (10) of said linear actuator (11).

7. A roof window according to any one of claims 1 to 6, wherein said first part (13, 28) is configured for reception of said second part (19; 41, 42) and wherein said first part (13, 28) is closed at one longitudinal end and open at an opposing longitudinal end (17, 43) through which opposing longitudinal end said second part (19; 41, 42) is received, and wherein said first part (13, 28) comprises first retaining means (20; 35, 36, 37, 45) configured for retaining said second part (19; 41, 42) upon introduction hereof in said first part (13, 28) thereby establishing releasable connection between said first part (13, 28) and said second part (19; 41, 42).

8. A roof window according to any one of claims 1 to 7, wherein said releasable coupling comprises:

a first part (13) open at one longitudinal end (17) and being provided with an internal channel comprising a first channel section (18) connecting the open end (17) with a first stop position (15), from which a second channel section (19) leads to a second stop position (20), from which a third channel section (21) leads to a third stop position (22) from which a fourth channel section (23) leads to the opening (17) of the first part (13), and wherein the first stop position (15) and the third stop position (22) are provided on inner surfaces of the first part (13) facing away from the opening (17) and the second stop position (20) is provided on an inner surface of the first part (13) closer to the opening (17) than the first and second stop positions (15, 22), and
a second part (19) provided with an attachment member (24) configured to be able to pass through the internal channel of the first part (13), the attachment member being movable under tension (26) such that it can follow the internal channel from the opening (17) through the channel sections (18, 19, 21, 23) and back to the opening (17).

9. A roof window according to any one of claims 1 to 8, wherein said releasable coupling comprises:

a first part (28) comprising a cylindrical housing (29) open at one longitudinal end (43) for reception of a second part (41, 42) of said releasable coupling, where the housing (29) longitudinally opposite said open end (43) is provided with a first rotation effecting member (34) fixed to the housing (29) and a third rotation effecting member (32) provided in the housing (29) opposite the first rotation effecting member (34), the third rotation effecting member (32) being configured for rotational and longitudinal movement within the housing (29), wherein first retaining means (35, 36, 37, 45) configured for retaining said second part (19; 41, 42) is attached to said third rotation effecting member (32) and moves together herewith, the housing (29) comprising an interior space (40) longitudinally between said first and second rotation effecting members (34, 39), which space (40) comprises a third rotation effecting member (32) that is free to undergo rotational and longitudinal movement in said space (40), where said first rotation effecting member (34) comprises teeth (30) facing similar teeth (33) provided on said third rotation effecting member (32) and facing the first rotation effecting member (34), and where said second rotation effecting member (39) comprises teeth (36) facing the third rotation effecting member (32) and configured for engagement with indentations (31) on the third rotation effecting member (32) facing the second rotation effecting member (39), where the third rotation effecting member (32) in the direction towards the opening (43) is connected with a cylindrical portion (37) comprising retaining bodies (35), and where the housing (29) and the cylindrical portion (37) are configured such that a rotation of the cylindrical portion (37) makes the retaining bodies (35) undergo radial movement, thereby creating a space (44) within which space an extended portion of a second part of the releasable coupling is retained by said retaining bodies (35), and
a second part (41, 42) comprising a longitudinally extending shaft portion (41) at the end hereof provided with a radially extended portion (42) configured for insertion in the open end (43) of the housing (29) of the first part (28).

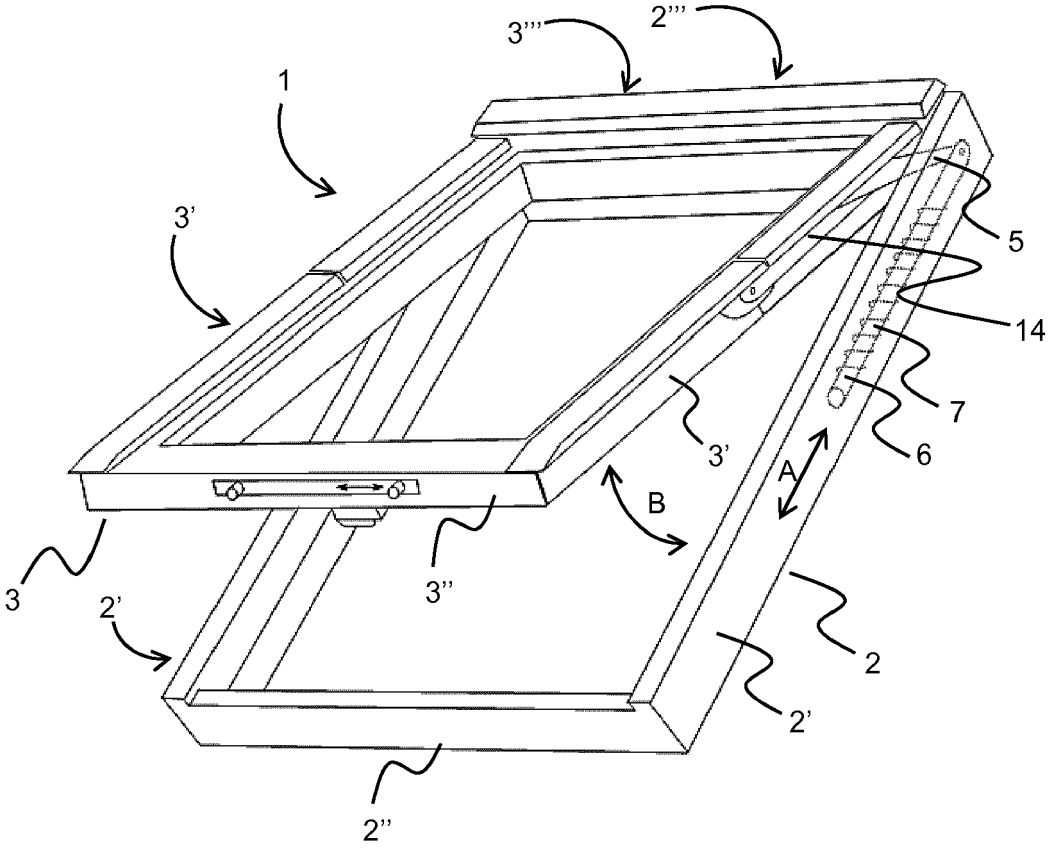



Fig. 1 (prior art)

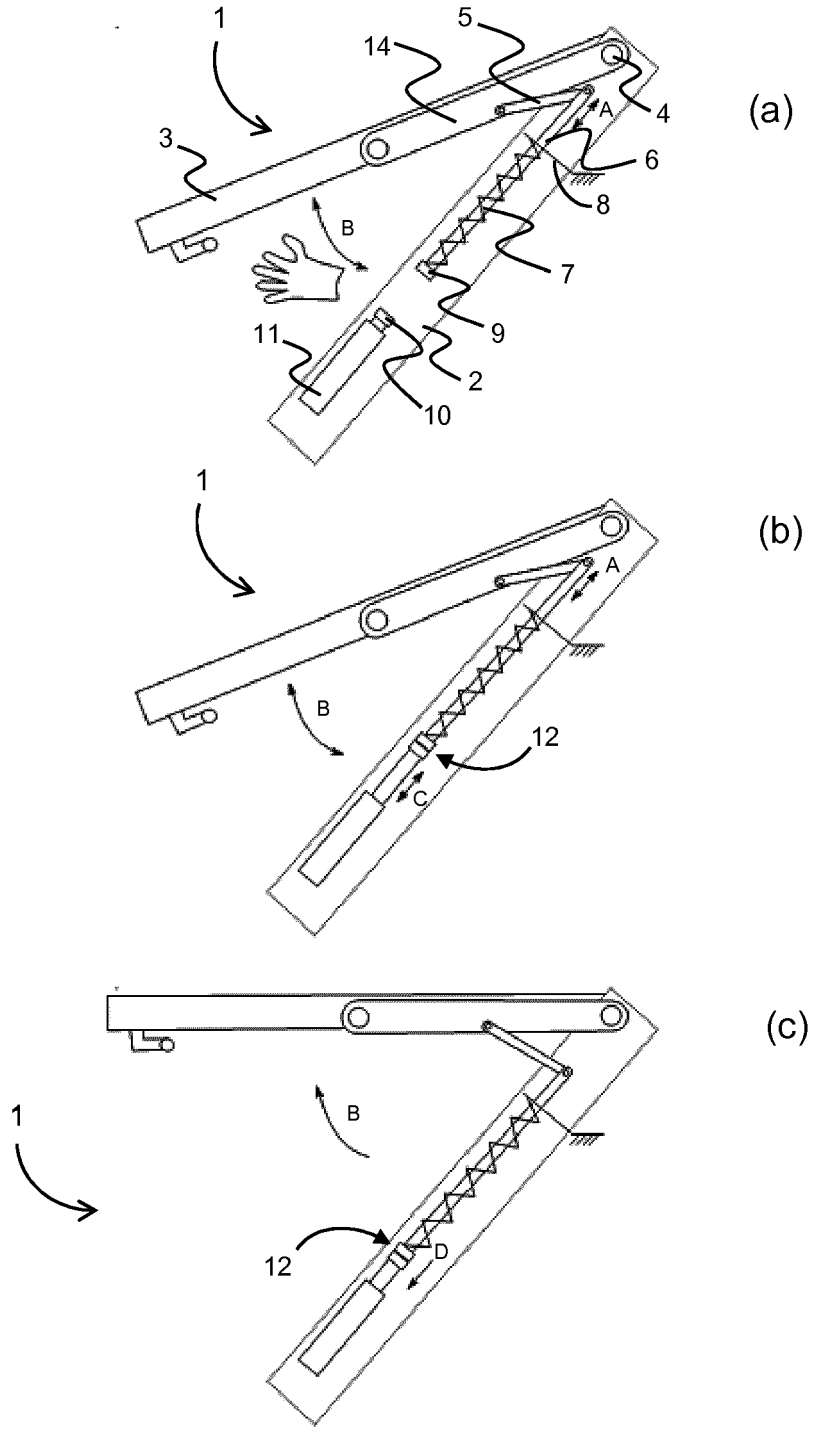
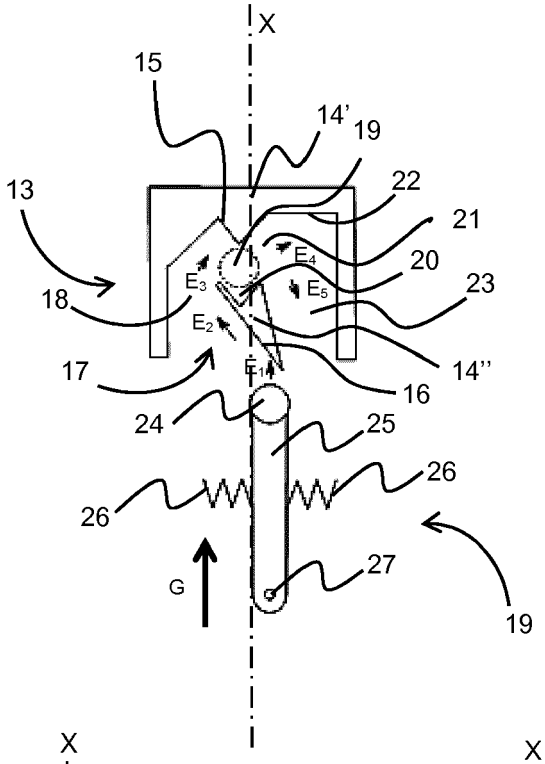



Fig. 2


X
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14'
19
22
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17
14''
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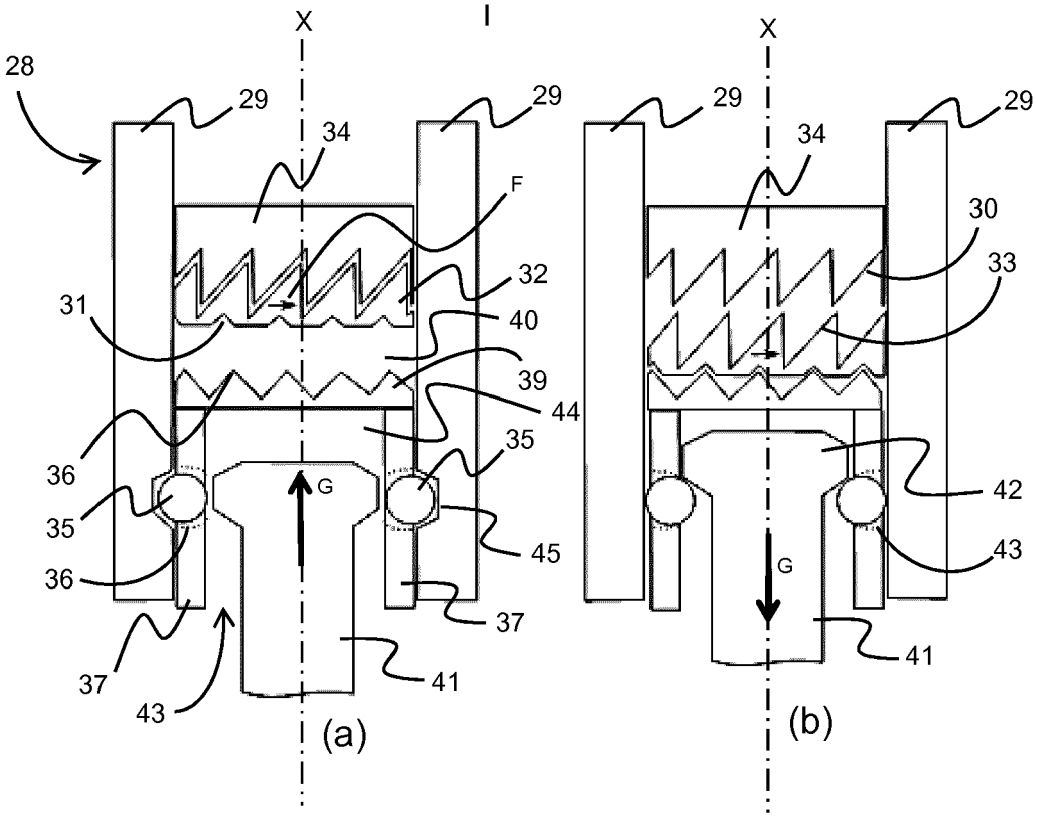
27
G
19

Fig. 3


X
28
29
34
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F
32
31
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39
44
35
36
G
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43
41
(a)
X
29
34
29
30
33
42
43
G
41
(b)

Fig. 4

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# EUROPEAN SEARCH REPORT

Application Number
EP 14 16 1684

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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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The present search report has been drawn up for all claims

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## REFERENCES CITED IN THE DESCRIPTION

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