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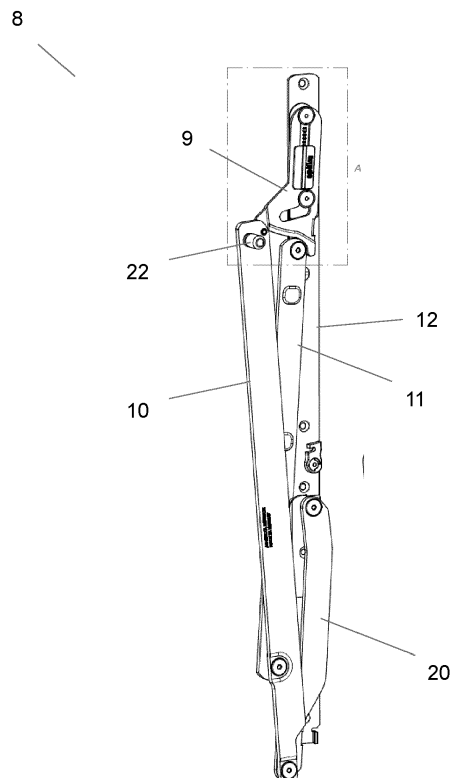
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(54) **COMPACT SPRING UNIT AND LATCH DEVICE FOR A HINGE SYSTEM**

(57) The invention relates to a compact spring unit for providing a spring force to a latch device, also referred to as a safety catch. The invention may be used for, but is not limited to doors or windows. The safety catch is a part of an extendable hinge system. The invention further relates to a method of easily and effectively assembling the latch device.

Fig. 1



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Description

Field of the invention

[0001] The invention relates to a compact spring unit for a latch device also known as a safety latch, safety catch, restrictor, retainer or safety lock for restricting movement of a movable components in a hinge system such as a window hinge or a door hinge.

Background

[0002] A vast number of window hinge systems are available in the market today. A particular type of hinge system allows a window sash to extend away from the wall (and the window frame) and/or to pivot or tilt 180 degrees for facilitating cleaning and maintenance of the outdoor window surface. Such extendable hinges are also used for easily opening a window and for providing ventilation of a certain degree. An extendable hinge is described in the international patent application WO2003021066A1.

[0003] These hinges are often equipped with a restrictor or safety catch to prevent the window sash from moving outwards to its extended position. The safety catch may still allow a small gap between the sash and the frame, and movement between the latching position and a completely closed position, while in its latching position.

[0004] Safety catches for extendable hinges also exist in a variety of designs. Safety catches are usually lifted upwards or sideways (depending on its orientation) to a releasing position to release the hinge.

[0005] A safety catch may be spring biased to automatically return to its original position after it is moved to its releasing position. For spring biased safety catches, assembly of the spring may be time consuming and complex. It is common to use tension springs which has to be stretched between two connection points and latched onto to the connection points. The spring used is usually quite small, which makes the operation difficult for the human hand. The safety catch is also mounted in a narrow / confined space. This makes assembly slow and ineffective.

[0006] The current invention seeks to provide a product and a simplified way of providing a spring force to a safety catch which makes assembly quicker, easier and more cost-effective.

Summary of the invention

[0007] The invention relates to a compact spring unit including a spring, a first spring support element, a second spring support element, wherein the spring is at a first end connected to a first spring receiving portion of the first spring support element, wherein the spring is at a second end connected to a second spring receiving portion of the second spring support element and wherein the first spring support element is moveably connected

to the second spring support element. The first spring support element and the second spring support element are moveable along the centre axis of the spring and configured to compress the spring when moved against each other.

[0008] The invention further relates to said spring unit, wherein the first spring support element comprises at least one flexible latching means and the second spring support element comprises at least one latching edge for receiving the flexible latching means, thereby providing means for moveably connecting the first spring support element to the second spring support element.

[0009] The invention further relates to said spring unit comprising a spring tunnel portion for containing the spring and for providing axial stability to the spring.

[0010] The invention further relates to said spring unit, wherein the second spring support element comprises flexible latching means for connecting the compact spring unit to an external frame structure such as a latch device body.

[0011] The invention further relates to said spring unit, wherein the first spring support element comprises guiding means for engaging the inner surface of the spring tunnel portion.

[0012] The invention further relates to said spring unit, wherein the first spring support element comprises a curved portion at one end for receiving a first anchoring means.

[0013] The invention further relates to said spring unit, including a cover plate comprising a groove for guiding the spring.

[0014] The invention relates to a latch device also referred to as a latch device for preventing movement between relatively-movable hinge parts.

[0015] The invention also relates to a corresponding latch device for an extendable hinge for doors or windows including a latch device body, a said compact spring unit, a first guiding slot for receiving and moveably connecting the latch device to a first anchoring means connected directly or indirectly to a window frame, and for receiving the compact spring unit, wherein the latch device is moveable between a first releasing position and a second latching position, wherein the compact spring unit is configured to apply a spring force against the first anchoring means when the latch device is in the first releasing position, and latch device latching means for receiving and latching onto at least one hinge arm via respective hinge arm latching means, thereby retaining the at least one hinge arm.

[0016] The invention further relates to said latch device further including a second guiding slot for receiving and moveably connecting the latch device to a second anchoring means connected directly or indirectly to a window frame.

[0017] The invention further relates to said latch device, wherein one of the latch device latching means is a latching hook and the respective hinge arm latching means is a protrusion.

[0018] The invention also relates to an extendable hinge for moving a window or door between a retracted and an extended position, including said latch device, at least one hinge arm, a first anchoring means for moveably connecting the latch device to a window frame or a support element, wherein each hinge arm comprises a hinge arm latching means, wherein the latch device is moveable between an releasing position and a latching position and wherein when the latch device is in the latching position, the latch device being configured to latch onto the hinge arm latching means by means of the latch device latching means and thereby retain the at least one hinge arm, and wherein when the latch device is in the releasing position, the latch device is configured to release the arm latching means and thereby also release the at least one hinge arm, wherein when the latch device is moved between the releasing position and the latching position the compact spring unit excites a spring force between the first anchoring means and the latch device so that the latch device is forced towards the latching position.

[0019] The invention also relates to assembling a latch device according to any of the preceding claims, comprising the steps of inserting a first anchoring means into the first guiding slot, inserting a compact spring unit into the first guiding slot.

[0020] The invention also relates to said method, further comprising the steps of inserting second anchoring means into a second guiding slot.

[0021] The invention further relates to a use of a said compact spring unit in a hinge system for doors or windows.

[0022] The invention further relates to a use of a said compact spring unit in an abovementioned latch unit.

Brief description of drawings

[0023]

Fig. 1 is a perspective view of a hinge system according to the invention;

Fig. 2A and 2B are perspective views of a latch device according to the invention, mounted to a hinge system according to the invention. Fig. 2A shows the front side of latch device. Fig. 2B shows the back side of the latch device;

Fig. 3A is an exploded perspective view of a compact spring unit according to the invention;

Fig. 3B is a transparent perspective view of the compact spring unit in an assembled state; and

Fig. 3C is a perspective view of the flexible latching means of a second support element including a detailed cross-section of the latching means.

Detailed description of embodimentssder

[0024] Fig. 1 is a perspective view of a hinge 8 according to the invention. The hinge 8 depicted in Fig. 1 is

primarily intended for windows.

[0025] The hinge 8 is typically located between the window frame (not shown) and the window sash (not shown). The hinge 8 is typically connected at one end to a window sash (not shown) and connected at another end to a window frame (not shown) also called casing.

[0026] For windows, two hinges 8 may be provided at two sides of the window sash (not shown). Preferably the hinge 8 is located in a narrow space between the sash (not shown) and the frame (not shown), and in such embodiment the hinge 8 is preferably at least partly comprised of flat or slender components.

[0027] The hinge 8 includes at least one hinge arm 10 connected at one connection point to the sash (not shown). The connection point may be a pin pivotally connected to the sash so that the sash can tilt or pivot relative to the hinge arm 10 while being supported by the hinge arm 10.

[0028] The hinge 8 may further include a second hinge arm 11 and/or a third hinge arm 20 connected to the first hinge arm 10 to extend the reach of the first hinge arm and/or to provide support to the first hinge arm 10. The hinge 8 may further comprise a support element 12.

[0029] The first hinge arm 10 may be connected to the frame (not shown) or the support element 12 directly or via the second hinge arm 11 and/or the third hinge arm 20. The hinge arms 10, 11, 20 may be rotatably connected to each other. The hinge arms 10, 11, 20 may be rotatably connected to the frame (not shown) or the support element 12.

[0030] The support element 12 may be a single elongated rail provided with several connection points for attaching the support element 12 to the frame (not shown). The hinge arms 10, 11, 20 may be pivotally connected to the support element 12 or to the frame (not shown) through the support element. The support element 12 also serves as a placeholder for connection points.

[0031] Each component of the hinge 8 described herein may be formed of any of metal, plastic or composite materials.

[0032] The hinge 8 further includes a latch device 9 for locking, latching or retaining the hinge arms preventing them from reaching their extended position. A latch device 9 may also be known as a safety latch, restrictor, retainer or safety lock in prior art.

[0033] The latch device 9 may be of any form. The latch device 9 is preferably a slender plate-like structure, substantially flat to fit in a narrow gap between a sash and a frame.

[0034] The hinge arms 10, 11, 20 acts as a support-arms for the window or door sash. The hinge arms 10, 11, 20 are extendable and retractable. The hinge arms 10, 11, 20 is configured to support and move the window or window sash or door between an extended position and a retracted position.

[0035] The hinge arms 10, 11, 20 may be restricted by a safety latch device 9 which will be further explained.

[0036] In an embodiment two hinges 8 are provided at

two opposite vertical sides of a window sash (not shown) wherein the sash is rotatably connected to both hinge arms 10. The hinge arms 10 can be indirectly connected to an inside of the window frame. The hinge arms 10 may pivot away from the wall and the window frame (not shown). The sash may via the hinge arms 10 be extended in a direction away from the frame, tilted about at least one axis and positioned away from the wall. The hinge system 8 is useful for providing a larger ventilation gap and can be used for providing an exit out of a building. Also, the hinge system 8 allows the window sash to be tilted 180 degrees so that the user can reach the front window surface from inside the building, e.g. for cleaning or maintenance.

[0037] Fig. 2A and 2B are perspective views of a latch device 9 mounted on a hinge 8 according to the invention. Fig. 2A shows the front side of latch device 9. Fig. 2B shows the back side of the latch device 9. In Fig. 2B parts of the support element 12 is cut out. The back side of the latch device 9 typically faces the inside of the window/door frame, and the front side of the latch device 9 typically faces the window or door sash when the door or window is locked.

[0038] The latch device 9 is mounted and configured to interact with components of the hinge 8, more specifically to retain the hinge arms 10, 11 in a retracted position preventing them from pivoting away from the wall to an extended position. The latch device 9 may still allow the hinge 8 some movement in the retracted position, so that the user may open the window or door slightly, and move the hinge arms 10, 11 and thereby also the sash (not shown) between a completely closed position and the position wherein the hinge arms are in the retracted position.

[0039] The latch device 9 is primarily intended for window hinges having rotatable and/or extendable arms such as the hinge system described above but can in principle be used for many different lock systems for objects such as doors, garage doors, lids, trap doors, appliances and furniture. The latch device 9 can be used for any hinge or lock mechanism or the like having movable components which movement must be restricted. Its purpose may be restricting movement of components for safety reasons or merely for adjusting or retaining or restricting the movement or position of a component.

[0040] The latch device body 100 may be of any form. The latch device body 100 is preferably a slender plate-like structure made of metal or plastic or composite material, substantially flat to fit in a narrow gap between a sash and a frame.

[0041] In the embodiment of Fig. 2A and 2B the latch device body 100 has a substantially oblong shape. In Fig. 2A and 2B the latch device 9 is oriented upright. In Fig. 2A and 2B the latch device 9 is in the latching position, also referred to as a locking position or retaining position. The latch device 9 is latched onto the hinge arms 10, 11 and the hinge arms 10, 11 are thus in their retracted position.

[0042] At its lower end the latch device body 100 typically spans wider and includes a latching portion. The latching portion includes at least one latching means 114. A first latch device latching means 114 may be located at one side of the latching portion. The first latch device latching means 114 may be a curved, hook-shaped portion to hook or catch a corresponding hinge arm latching means 14 located on a first hinge arm 10. The hinge arm latching means 14 may be a protrusion, preferably cylindrical. The first latch device latching means 114 includes an inclined surface on its outer side (right side in Fig. 2B). The inclined surface provides a vertical force component to the latch device 9 when the hinge arm latching means 14 is pushed against the inclined surface, thereby lifting the latch device 9 so that the hinge arm latching means 114 can slip under and rest against the inner surface of the latch device latching means 114.

[0043] A second latch device latching means 113, see Fig. 2A, may be located at the opposite side of the latch device latching means 114. The second latch device latching means 113 may be a curved portion extending downwards providing a supporting edge or surface for receiving the top end of a second hinge arm 11. The top end of the second hinge arm 11 itself may be considered a second hinge arm latching means 15.

[0044] The latch device 9 includes at least one first guiding slot 101 i.e. a slotted hole or openings. The first guiding slot 101 may be of any shape, preferably an elongated shaped, preferably the same shape as an outer edge of a spring unit 200 which will be further explained. The first guiding slot 101 is typically cut out of the latch device body 100.

[0045] The first guiding slot 101 may have different shapes to fit the outline or edge of the compressible compact spring unit 400. The compact spring unit 400 itself acts as a compression spring.

[0046] The first guiding slot 101 is shaped to receive and house both an anchoring means 111 and the compact spring unit 400, the two abutting each other directly or indirectly.

[0047] The compact spring unit 400 may be easily fixed to the latch device body 100 by means of second flexible latching means 204 (see Fig. 3C).

[0048] The latch device 9 may be moveably or slidably connected to the support element 12 or directly to the frame (not shown) via at least one anchoring means 111.

[0049] The anchoring means 111 may be a rivet, button, nail, pin, bolt or a similar boltshaped element having a slender cylindrical portion as seen in Fig. 2B and a larger head portion with a wider diameter or larger circumference as seen in Fig. 2A. The slender cylindrical portion of the anchoring means 111 is preferably substantially equal or smaller than the width of the first guiding slot 101 so that it may slide along the first guiding slot 101 longitudinal axis. This allows the latch device 9 to move/travel/slide relative to the anchoring means 111 along the longitudinal axis of the first guiding slot and along a path between a latching position and a releasing

position. The head portion of the anchoring means 111 has a wider diameter/width than a width of the first guiding slot 101, thus overlapping the first guiding slot 101, which prevent the latch device 9 from escaping or falling off the anchoring means 111.

[0050] The latch device 100 may optionally comprise a second guiding slot 112 for guiding a second anchoring means 110 and thereby also the latch device 9. The second guiding slot 112 is configured to receiving and moveably connecting the latch device 9 to a second anchoring means 110 connected to a window frame or a support element 12.

[0051] The second guiding slot 112 may comprise a curved portion or be substantially L-shaped. The second guiding slot 112 may comprise a substantially horizontal portion wherein the second anchoring means 110 may rest while the latch device 9 is in the releasing position. The second guiding slot 112 ensures that the latch device 9 is forced to rotate when lifted, but also allows the latch device 9 to momentarily rest in the releasing position against the second anchoring means 110.

[0052] The latch device 9 is moveably between a first releasing position and a second latching position. In the embodiments depicted in the figures, the latch device 9 is placed in the releasing position by lifting the latch device 9 upwards. The latching position is in the opposite direction. The latch device 9 is placed in the latching position automatically because the latch device 9 is spring biased and may furthermore be prone to a gravitational force directed towards the latching position. By first lifting the latch device 9 a counter-acting potential energy is built up by a spring force and by gravitation. By releasing the latch device 9 while in the releasing position, the latch device 9 is forced back to the lower latching position.

[0053] The spring force is activated by compressing the compact spring unit 400 which excites a counter force when compressed.

[0054] The latch device 9 is configured to also function in a non-vertical or horizontal axis, or even upside down vertically, as the spring force obtained is higher than the weight / force of gravity of the latch device 9.

[0055] Fig. 3A is an exploded perspective view of a compact spring unit 400 according to the invention.

[0056] The compact spring unit 400 includes a first spring support element 300, a second spring support element 200 and a spring 500. The compact spring unit 400 acts as and may be referred to as a compressible spring container or spring package. The spring 500 is preferably a helical metal, composite or plastic coiled compression spring. The spring 500 may consist of several springs connected in series.

[0057] The first spring support element 300 includes a first spring receiving portion 302 adapted to receive and support one end of a spring 500. The first spring receiving portion 302 may be shaped as a cylindrical protrusion having a diameter smaller, equal or corresponding to the inner diameter of the cylindrical coil spring 500. The coil spring 500 may therefore be fitted on top of and around

the first spring receiving portion 302 which holds the spring in place. This facilitates mounting and assembly.

[0058] The first spring support element 300 may have a rounded shape at one end (top end in Fig. 3A) for easily pivoting around a round part of the first anchoring means 111 (see Fig. 2A).

[0059] The first spring support element 300 may include guiding means 301 for engaging an inner surface of a spring tunnel portion 203 of the second spring support element 200. The guiding means 301 may be a plurality of spaced apart protrusions on both sides of the first spring support element 300. The guiding means 301 are shaped to correspond with the inner surface of a spring tunnel portion 203 and/or a cover plate guiding groove 211. The guiding means 301 protrusions may be semi-circular, partially torus-shaped, square, rectangular, cubical, curved or partially round-edged protrusions. The guiding means 301 serve to provide axially stable movement of the first spring support element 300 while moving inside the second spring support element 200. Also, they serve to guide the first spring support element 300 while also reducing friction opposed to a continuous cylinder creating friction against a cylindrical tunnel. The protrusions are advantageously edged so that dust particles don't stick to the outer surface of the guiding means 301, trapping dust particles between the spring tunnel portion 203 and the guiding means 301.

[0060] The second spring support element 200 may include a spring tunnel portion 203 and a second spring receiving portion 202. The spring tunnel portion 203 is configured to house and at least partly surround the spring 500 preventing the spring from bending outwards or out of its centre axis, thereby providing axial support to the spring. The inside of the spring tunnel portion 203 may be substantially semi-cylindrical, rounded or any shape corresponding to the shape of the spring 500 or the shape of the guiding means 301.

[0061] The second spring support element 200 may include a support housing 220. The spring tunnel portion 203 may be a part of the support housing 220. The support housing 220 may have two side openings or slots 221, 221'. The side slots 221, 221' have two upper edges (facing downwards in Fig. 3A) advantageously serving as latching edges 230, 230'.

[0062] The spring unit 400 may be operational in a dusty/moist environment. The side slots 221, 221' advantageously provides a ventilated openings for preventing dust particles and moisture from getting trapped inside the second spring support unit 200 while at the same time providing latching edges 230, 230'.

[0063] The second spring receiving portion 202 is configured to receive an opposite end of the spring 500 and serves as and may be referred to as a spring stop. The spring 500 is preferably sufficiently long to reach both the first and second spring receiving portion 302, 202 when the spring unit 400 is assembled.

[0064] The second spring support element 200 may include a cover plate 210. The cover plate 210 may span

wider and/or serve as a support plate for the support housing 220. The cover plate 210 advantageously hides and protects the back portion of the second spring support element. This is advantageously aesthetic as seen in Fig. 2A. It also serves the purpose of shielding the spring 500 and its surrounding components from dust, moisture and water which may rust a metal spring.

[0065] The cover plate 210 or the second spring support element 200 may include second flexible latching means 204 for latching onto the latch device body 100 first guiding slot 101 (see Fig. 2B) thereby providing a connection for fixing the second spring support element 200 to the latch device body 100. The second flexible latching means 204 may be in principle a standard plastic clip or snap lock.

[0066] The spring tunnel portion 203 may cover or at least partially surround a first side of the spring 500. A cover plate 210 may cover or at least partially surround the other side of the spring. The spring tunnel portion 203 and the cover plate 210 may together form a channel or boring or tunnel for the spring 500.

[0067] The cover plate 210 may include a longitudinal groove 211 or recess for guiding the spring and for providing a curved surface corresponding to the outer surface of the spring 500.

[0068] The first spring support element 300 may include two first flexible latching means 303, 303' such as spears or prongs extending out from the first spring support element 300 body. The spear tips include a rear facing catching edge surface serving in principle as a hook.

[0069] The first spring support element 300 may be inserted into the second spring support element 200. While inserting, the first flexible latching means 303 engages the support housing 220 and bends inwards. The first flexible latching means 303 are spaced apart corresponding to the first open end of the support housing 220. The two latching means 303, 303' are configured to respectively latch onto the two latching edges 230, 230' thereby connecting the spring support element 300, 200.

[0070] This provides an easy way of assembling the compact spring unit 400.

[0071] Fig. 3B is a transparent perspective view of the compressible compact spring unit 400 in an assembled state. Fig. 3B shows how the spring 500 is located between the first spring support element 300 and the second spring support element 200. When the spring support elements 200, 300 are pressed together or moved towards each other in the assembled state, the spring 500 is compressed and forces the spring support elements 200, 300 away from each other.

[0072] The spring 500 does not need to be pre-biased in its initial position. This makes assembly quite easy. The spring unit 400 is assembled by inserting the spring into the tunnel portion 203 and thereby inserting the first spring support element 300 into the second spring support element 200 sandwiching the spring 500 between the first and second spring receiving portions.

[0073] Fig. 3C is a perspective view of the flexible latch-

ing means of the second support element 200 including a detail cross-section of the latching means. In Fig. 3C, the second flexible latching means 204 is engaged with the first guiding slot 101 as can be seen from the detail cross-section. When the second spring support element 200 is pressed onto the latch device body 100 the second flexible latching means 204 latches onto / clips on to the first guiding slot 101. This provides easy assembly of a spring unit 400 compared to more complex prior art disclosed in the background section.

Claims

1. Compact spring unit (400) comprising:
 - a spring (500);
 - a first spring support element (300);
 - a second spring support element (200);
 - wherein the spring (500) is at a first end connected to a first spring receiving portion (302) of the first spring support element (300);
 - wherein the spring (500) is at a second end connected to a second spring receiving portion (202) of the second spring support element (200);
 - wherein the first spring support element (300) is moveably connected to the second spring support element (200);
 - wherein the first spring support element (300) and the second spring support element (200) are moveable along the centre axis of the spring (500) and configured to compress the spring (500) when moved against each other.
2. Compact spring unit (400) of claim 1, wherein the first spring support element (300) comprises at least one first flexible latching means (303) and the second spring support element (200) comprises at least one latching edge (230) for receiving the flexible latching means (303), thereby providing means for moveably connecting the first spring support element (300) to the second spring support element (200).
3. Compact spring unit (400) of any preceding claim, comprising a spring tunnel portion (203) for containing the spring (500) and for providing axial stability to the spring (500).
4. Compact spring unit (400) of any preceding claim, wherein the second spring support element (200) comprises a second flexible latching means (204) for connecting the compact spring unit (400) to an external frame structure such as a latch device body (9).
5. Compact spring unit (400) of any preceding claim,

wherein the first spring support element (300) comprises guiding means (301) for engaging the inner surface of the spring tunnel portion (203).

6. Compact spring unit (400) of any preceding claim, wherein the first spring support element (300) comprises a curved portion (310) at one end for receiving a first anchoring means (111). 5
7. Compact spring unit (400) of any preceding claim, comprising a cover plate (210) comprising a groove (211) for guiding the spring (500). 10
8. Latch device (9) for an extendable hinge (8) comprising: 15
 - a compact spring unit (400) according to any of the preceding claims;
 - a latch device body (100);
 - a first guiding slot (101) for receiving and moveably connecting the latch device (9) to a first anchoring means (111) connected directly or indirectly to a window frame, and for receiving the compact spring unit (400); 20
 - wherein the latch device (9) is moveable between a first releasing position and a second latching position; 25
 - wherein the compact spring unit (400) is configured to apply a spring force against the first anchoring means (111) when the latch device (9) is in the first releasing position; 30
 - latch device latching means (113, 114) for receiving and latching onto at least one hinge arm (10, 11) via respective hinge arm latching means (14, 15), thereby retaining the at least one hinge arm (10, 11). 35
9. Latch device (9) according to claim 8 further comprising: 40
 - a second guiding slot (112) for receiving and moveably connecting the latch device (9) to a second anchoring means (110) connected directly or indirectly to a window frame.
10. Latch device (9) according to any of claim 8 or 9, wherein one of the latch device latching means is a latching hook (114) and the respective hinge arm latching means (14) is a protrusion (14). 45
11. Extendable hinge system (8) for windows or doors, comprising: 50
 - a latch device (9) according to any of the preceding claims;
 - at least one hinge arm (10, 11); 55
 - a first anchoring means (110, 11) for moveably connecting the latch device (9) to a window frame or a support element (12) ;

wherein each hinge arm (10, 11) comprises a hinge arm latching means (14, 15);
 wherein the latch device (9) is moveable between an releasing position and a latching position;
 wherein when the latch device (9) is in the latching position, the latch device (9) is configured to latch onto the hinge arm latching means (14, 15) by means of the latch device latching means (113, 114) and thereby retain the at least one hinge arm (10, 11); and
 wherein when the latch device (9) is in the releasing position, the latch device (9) is configured to release the arm latching means (14, 15) and thereby also release the at least one hinge arm (10, 11);
 wherein when the latch device (9) is moved between the releasing position and the latching position the compact spring unit (400) excites a spring force between the first anchoring means (111) and the latch device (9) so that the latch device (9) is forced towards the latching position.

12. Method of assembling a latch device (9) according to any of the preceding claims, comprising the steps of:
 - anchoring the latch device (9) by inserting a first anchoring means (111) into the first guiding slot (101);
 - inserting a compact spring unit (400) into the first guiding slot (101).
13. Method of claim 12, further comprising the steps of: inserting second anchoring means (110) into a second guiding slot (112).
14. Use of a compact spring unit (400) according to any preceding claims in a hinge system for doors or windows.
15. Use of a compact spring unit (400) in a latch unit (9) according to any preceding claim.

Fig. 1

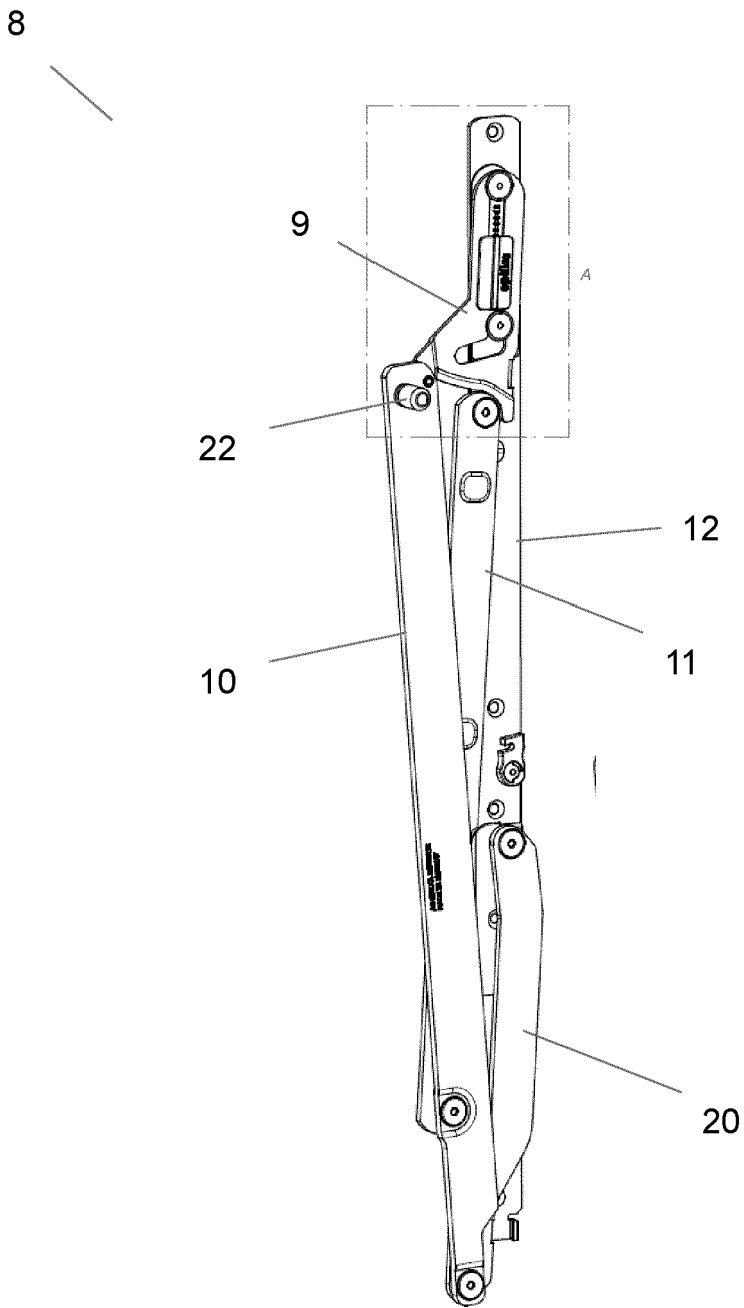


Fig. 2A

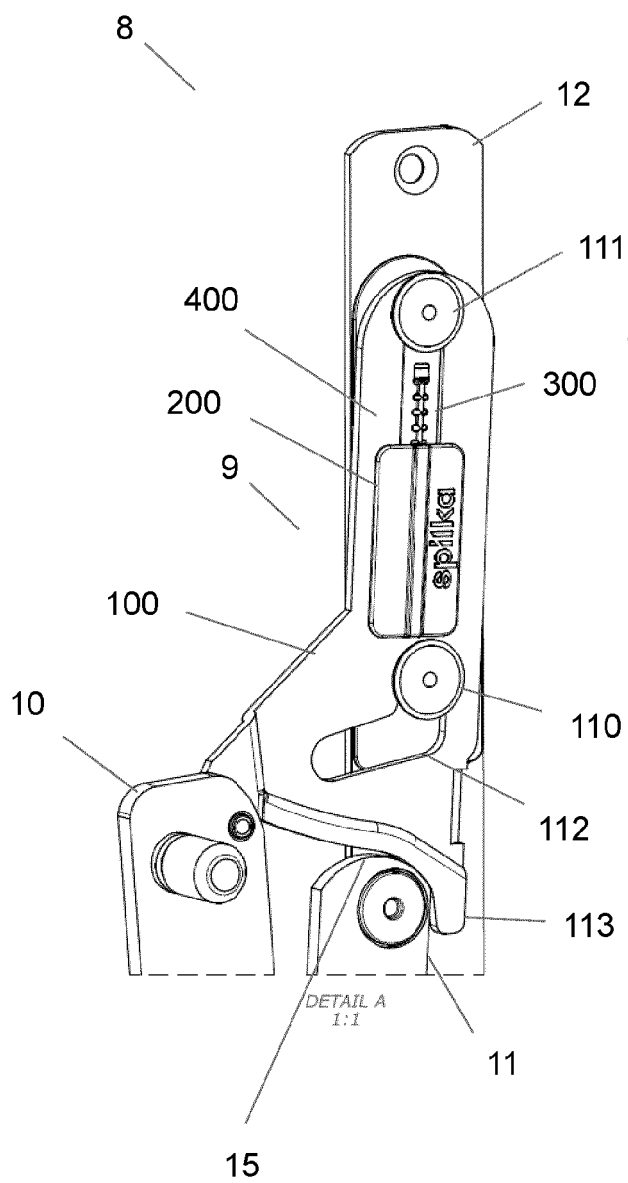


Fig. 2B

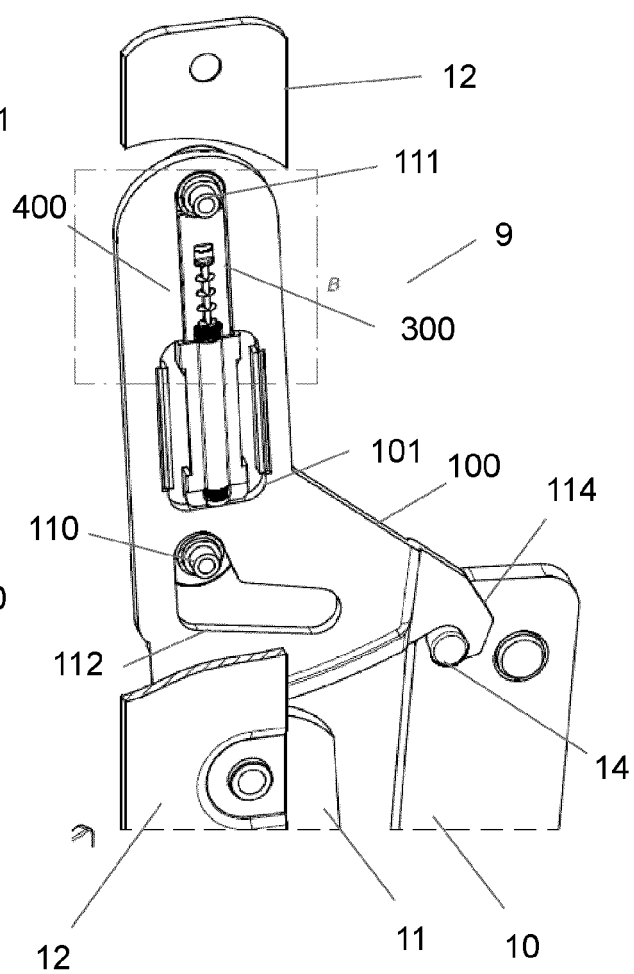


Fig. 3B

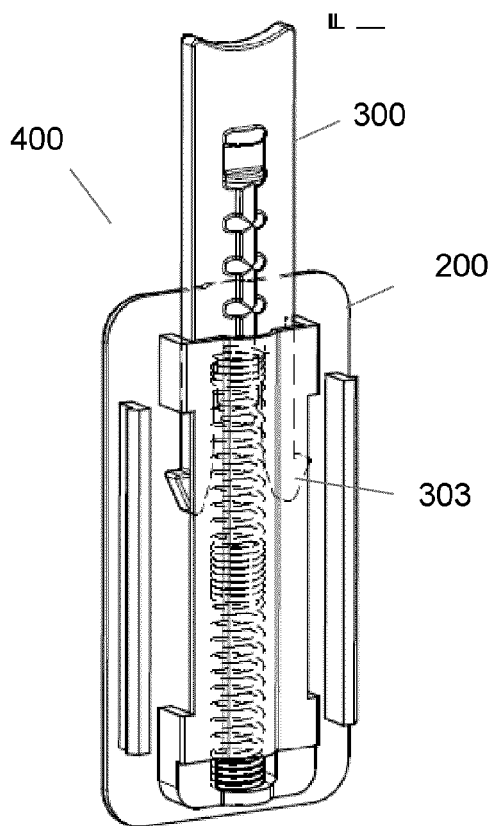


Fig. 3A

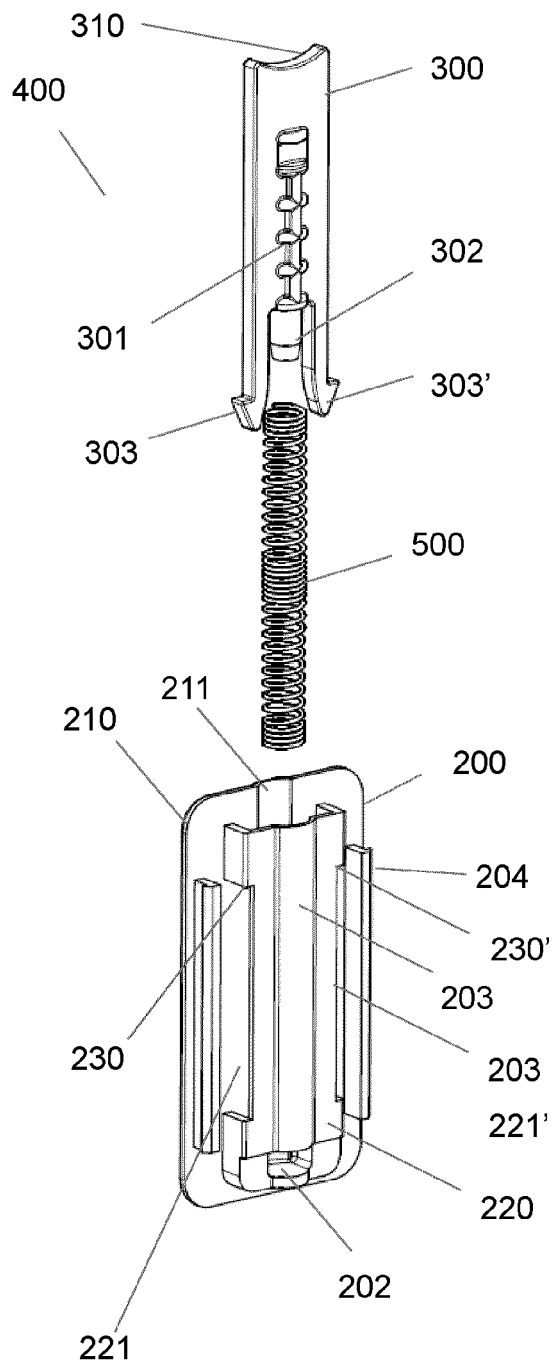
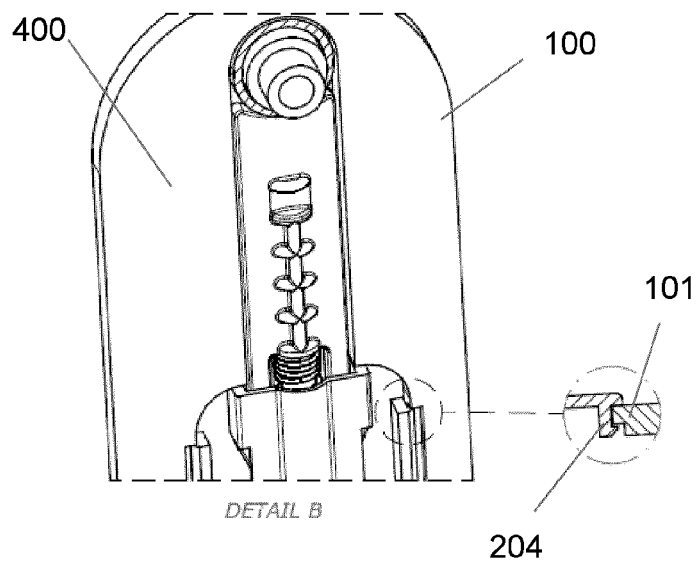


Fig. 3C





EUROPEAN SEARCH REPORT

Application Number

EP 23 20 4561

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
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Place of search The Hague		Date of completion of the search 11 March 2024	Examiner Berote, Marc
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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