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(54) **Sliding bolt locking device**

(57) A sliding bolt locking device (1) comprising a housing (3) provided with a slot (4), a bolt (5) moveably arranged in said housing (3), a handle (6) fixed transversely to said bolt (5) and projecting out of said housing (3) through said slot (6), and a locking mechanism (8) arranged to lock said bolt (5). The housing is further provided with at least one notch (7a) which opens out in said slot (4) to receive said handle (6) by a rotation of said bolt (5) about its longitudinal axis (L), and said locking mechanism (8) comprises an intermediary locking element (9) and a locking element (10) which are moveable relative to one other between a locking position and an unlocking position. The intermediary locking element (9) is slideably but substantially irrotateably coupled to the bolt (5) so that the bolt can slide between its extended and retracted positions and can be locked by means of the handle (6) in said notch (7a).

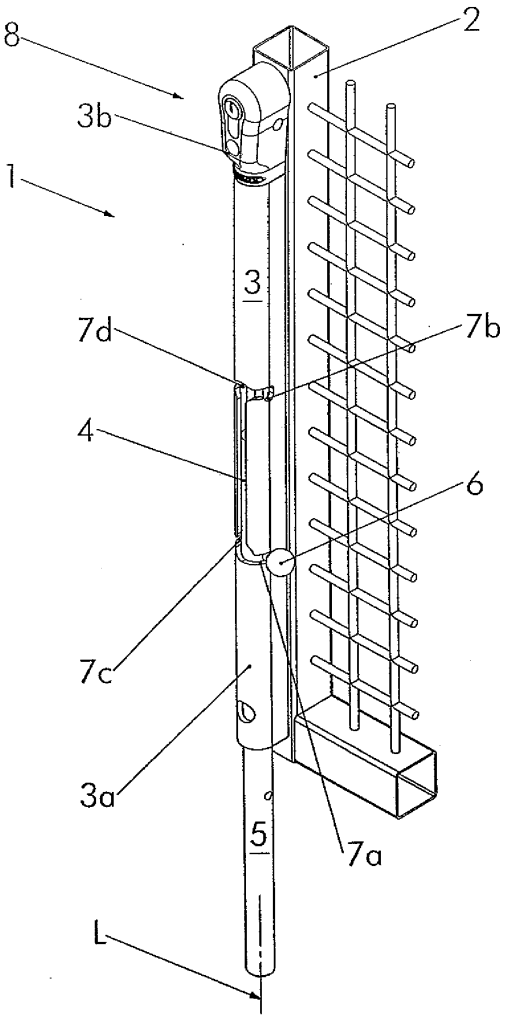

Fig 1

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Description

[0001] The present invention relates to a sliding bolt locking device comprising a housing provided with a slot, a bolt moveably arranged in said housing to slide along a longitudinal axis between an extended and a retracted position, a handle fixed transversely to said bolt and projecting out of said housing through said slot to slide in said slot, and a locking mechanism arranged to lock said bolt at least in its extended position.

[0002] Such sliding bolt locking device is known from US4802351, which discloses a sliding bolt lock for doors or gates.

[0003] The locking mechanism in US4802351 comprises a padlock configured to enter the rear extremity of the lock's housing. By doing so, the rearward extremity of the bolt, when the bolt is in the extended position, abuts against the bottom extremity of the padlock, thereby fixing the forward extremity of the bolt in its extended position wherein it protrudes from the front extremity of the housing. To unlock the bolt, several steps have to be taken before the bolt can be slid rearwardly, among which removing the padlock from the housing. Only when the padlock is removed from the housing, the bolt can slide rearwardly so that its forward extremity no longer protrudes forwardly of the housing.

[0004] A drawback of these known sliding bolt locking devices is that in practice, removing the padlock from the housing and thereafter rearwardly sliding the bolt is clumsy.

[0005] It is an object of the present invention to provide a sliding bolt locking device for a bolt that can be unlocked in an easier way.

[0006] To this end, the sliding bolt locking device according to the invention is characterised in that said housing is further provided with a first transverse notch which opens out in said slot and which is arranged to receive said handle in the extended position of the bolt by a rotation of said bolt about said longitudinal axis, and in that said locking mechanism comprises an intermediary locking element, which is rotateably mounted in said housing around said longitudinal axis, and a locking element which is moveable relative to said intermediary locking element between a locking position and an unlocking position wherein, in said locking position, the locking element locks the intermediary locking element against rotation, the intermediary locking element being slideably coupled to said bolt in such a manner as to prevent, in the locking position of the locking element, the handle of said bolt, when being locateds in said first transverse notch, from rotating out of said first transverse notch and to enable, in the unlocking position of the locking element, the handle of said bolt to rotate out of said first transverse notch into said slot.

[0007] In the present sliding bolt locking device, in contrast with the sliding bolt locking device according to the prior art, the locking mechanism does not directly prevent the bolt from sliding, but prevents the bolt from rotating. The housing, being provided with the notch opening out in the slot, cooperates with the handle on the bolt so that, to be able to slide the bolt along the longitudinal axis, the handle first has to move out of the notch by rotation of the bolt. Thereby, by locking the rotation of the bolt, indirectly the sliding of the bolt is also locked.

[0008] Rotation of the bolt can be prevented via the intermediary locking element which extends along the longitudinal axis of the bolt and which is slideably coupled to the bolt. Thereby, the intermediary locking element can be arranged in the housing in a longitudinally non-slideable manner or in an only limited slideable manner (considered relative to the sliding of the bolt), while maintaining a coupling with the bolt when the bolt reciprocally slides from the retracted to the extended position. The locking element, which locks the intermediary locking element against rotation at least when the handle is in the notch, can thereby be arranged at a fixed position in the housing. In this fixed position, the locking element is operateable to move relative to the intermediary locking element from a locking position to an unlocking position, whereby in the locking position the locking element prevents the intermediary locking element from rotating. In such configuration according to the invention, the intermediary locking element bridges a distance between the bolt and the locking element, whether the bolt is in the retracted or in the extended position. This has as a result that no mounting or removing of any of the locking element and intermediary locking element, such as the padlock in the prior art, is required to be able to lock the bolt from rearwardly sliding. Thereby, the unlocking of the bolt according to the present invention is significantly simplified.

[0009] Preferably, in the unlocking position, the locking element allows the intermediary locking element to rotate. Such configuration at its turn allows the intermediary locking element to be slideably coupled to the bolt in such a manner that the intermediary locking element rotates simultaneous with the bolt, namely the intermediary locking element can freely rotate with respect to the locking element in the unlocking position. This configuration thereby simplifies the slideable connection between the intermediary locking element and the bolt.

[0010] Preferably said locking element is reciprocally operateable in a direction parallel to said longitudinal axis from the locking position to the unlocking position by means of a key-operated driving dog. In such configuration, the bolt of the sliding bolt locking device is lockable via a key. The key does not directly locks the bolt but indirectly locks the bolt by shifting the locking element in the locking position where it prevents the intermediary locking element from rotating, which intermediary locking element in its turn prevents the bolt from rotating out of the notch. Due to this indirect locking of the bolt from moving out of the notch, a key-operated driving dog is mountable at one end of the housing of the sliding bolt locking device. This furthermore significantly simplifies unlocking the bolt since only a rotation of the lock cylinder

by means of the key is required.

[0011] Preferably, said bolt is substantially cylindrical. The bolt being cylindrical simplifies the rotation of the bolt and simplifies the construction guiding the bolt in the reciprocal movement from the retracted to the extended position.

[0012] Preferably, said housing is provided with a second transverse notch opening out in said slot and arranged to receive said handle in the retracted position of said bolt by a rotation of said bolt about said longitudinal axis. By engaging the handle of the bolt in the further notch, the bolt can be kept in the retraced position.

[0013] Preferably said intermediary locking element has a lower extremity with a non-circular cross-sectional outer shape and said bolt has a hole which extends along said longitudinal axis, which is arranged to slideably receive said lower extremity of said intermediary locking element and which has at least locally a non-circular cross-sectional shape which substantially corresponds to said non-circular cross-sectional shape of the lower extremity of said intermediary locking element, in such a manner that rotation of the intermediary locking element relative to the bolt is prevented, or, wherein said bolt has an upper extremity with a non-circular cross-sectional outer shape and said intermediary locking element has a hole which extends along said longitudinal axis, which is arranged to slideably receive said upper extremity of said bolt and which has at least locally a non-circular cross-sectional shape which substantially corresponds to said non-circular cross-sectional shape of the upper extremity of said bolt, in such a manner that rotation of the bolt relative to the intermediary locking element is prevented. Using corresponding cross-sectional shapes for the bolt and the intermediary locking element to engage with one another provides in a simple technical solution to allow relative sliding of one with respect to the other in the longitudinal direction while preventing relative rotating of one with respect to the other around the longitudinal axis.

[0014] Preferably, said cross-sectional shape is a regular polygonal shape with N corners, N being an integer from 3 to 6. Preferably, the notch or notches have a depth so that the handle rotates about the longitudinal axis over 360/N degrees when rotating from said slot to the bottom of said notch. In such configuration, the bolt is both lockable when the handle is in the notch and lockable when the handle is in the slot. When another notch opens in the slot on the other side as the side where the notch and the further notch open, the bolt is also lockable in this another notch.

[0015] Preferably, said locking element comprises a non-circular opening arranged to receive, in its locking position, a first section of said intermediary locking element, which has a further non-circular cross-sectional shape so that, in said locking position, said first section of said intermediary locking element is located in said opening and prevented from rotating with respect to said locking element. Such configuration provides in a simple technical solution for blocking the rotation of the intermediary locking element with respect to the locking element. Preferably, in said unlocking position, a second section of said intermediary locking element, having a shape enabling said second section to rotate in said opening, is located in said opening. Thereby, two sections are defined on the intermediary locking element, both sections lying close to the locking element. The first section is provided with a shape that corresponds to the shape of the opening in the locking element at least in a manner so as to prevent rotation of the intermediary locking element with respect to the locking element, when this first section is introduced in the opening. A second section is provided with another shape, that allows a rotation of the intermediary locking element with respect to the locking element, when this second section is introduced in the opening. Preferably the first section is located on the intermediary locking element directly adjacent the second section so that the locking element only needs to move little to change the opening from surrounding the first section to surrounding the second section.

[0016] Preferably, said intermediary locking element comprises a lateral protrusion which is received in a transverse guide to keep the intermediary locking element in one longitudinal position. Such lateral protrusion and corresponding guide provide in a simple technical solution to fix the intermediary locking element in a longitudinal position while allowing the intermediary locking element to rotate around the longitudinal axis.

[0017] The invention will now be described in more details with respect to the drawings illustrating some preferred embodiments of a sliding bolt locking device according to the present invention. In the drawings:

figure 1 shows a sliding bolt locking device according to the invention mounted to a gate;
figure 2 shows the sliding bolt locking device sectioned to show inside components;
figures 3A and 3B illustrate the locking element respectively unlocking and locking the intermediate locking element from rotation;
figure 4 shows part of the sliding bolt locking device sectioned to show inside components; and
figure 5 illustrates the rotation of the handle around the longitudinal axis.

[0018] In the drawings a same reference number has been allocated to a same or analogous element.

[0019] In sliding bolt locking devices, particularly in sliding bolt locking devices for outdoor appliances such as gates or doors, as is the sliding bolt locking device according to the present invention, simplicity is a major advantage. Every moving element in the device can become stuck due to water, dirt, ice, temperature differences and other weather related influences. It is therefore a goal when designing sliding bolt locking devices to keep the technical solutions as simple as possible with the smallest possible number of moving elements. Further-

more, the moving elements are designed to engage with one another with large contacting surfaces. Large contacting surfaces ensure that forces can be transmitted even when dirt, water or ice is present. Large contacting surfaces furthermore typically keep tensions in the moving elements lower thus decreasing the risk of overloading and breaking such elements.

[0020] Figure 1 shows a sliding bolt locking device 1 according to the invention fixed to a tubular frame 2 of a first leaf of a hinged gate (only partially shown). The sliding bolt locking device 1 comprises a housing 3 fixed to said frame 2 and comprising an elongated base part 3a and an upper part 3b. The elongated base part 3a of the housing is provided with a slot 4 extending longitudinally to a bolt 5 arranged so as to reciprocally slide along a longitudinal axis (i.e. the longitudinal axis L of the bolt 5) in the housing 3 from a retracted position to an extended position and vice versa. A handle 6 is fixed by means of a screw 23 (see Figure 2) to the bolt 5 which handle transversely protrudes from the bolt 5. The handle 6 is designed to slide in the slot 4 when the bolt is sliding along the longitudinal axis L in the housing 3, with the handle 6 sliding in the slot 4 to limit the movement of the bolt in the longitudinal direction. In the retracted position, the handle 6 is located at one end of the slot 4 while in the extended position, the handle 6 is located at another end of the slot 4.

[0021] The housing 3 is provided with at least one transverse notch 7, preferably four transverse notches 7a, 7b, 7c and 7d which open out in the slot 4. The handle is provided to enter in the notches 7 by a rotation of the bolt 5 around the longitudinal axis L. To this end, the base part 3a of the housing 3 is preferably formed as a tubular member extending around the longitudinal axis L. The notches 7 are preferably provided at the location of the longitudinal extremities of the slot 4 so that when the bolt is in its retracted or in its extended position, the handle can engage in a notch 7 thereby holding the bolt in the respective position. Each notch 7 has a depth which is defined as the distance measured perpendicular to the longitudinal axis L between the longitudinal centre line of the slot 4 and the bottom of the notch 7. The depth of the notch is chosen in relation with the bolt and the handle protruding from the bolt so that the handle can be easily kept in the notch. The notches are formed so that a rotation of the bolt over 360/N degrees, N being an integer from 3 to 6 and being preferably equal to 4, has as a result that the handle rotates from being in the slot to being at the bottom of the notch.

[0022] The housing is preferably provided with at least two notches 7 for receiving the handle 6, namely a first transverse notch 7a, arranged to keep the bolt in its extended position, and a second transverse notch 7b, arranged to keep the bolt in its retracted (lifted) position. In order to be able to used the locking device for both left and right turning doors or gates, two additional transverse notches are provided, namely a third transverse notch 7c, which is located on the other side of the slot 4 than first transverse notch 7a, and a fourth transverse notch 7d, which is located on the other side of the slot than the second transverse notch 7b. In the illustrated embodiment, the notches 7 are also used to enable to fix the handle 6 by means of the screw 23, which passes through the bolt 5, in different locations to the bolt 5, whilst preventing however, in the extended position of the bolt 5, to remove the handle 6. To this end, the fourth notch 7d is situated opposite the second notch 7b so that in the retracted position of the bolt 5 the screw 23 can be released by means of a screwdriver applied through the fourth (or second) notch. When the bolt 5 is however locked in its extended position, the handle cannot be removed since the third notch is shifted longitudinally with respect to the first notch so that the screw 23 cannot be reached by means of a screwdriver.

[0023] The bolt 5 makes it possible, when the bolt 5 is in the extended position, to fix the first leaf in a stable manner to the floor, or to the wall (when the bolt is mounted in a horizontal position) or another leaf of the door or gate by means of a portion of this bolt 5 then projecting from the frame 2 of the leaf and cooperating with a corresponding element (not shown) provided in or fixed to the floor, wall or other leaf in question. The other leaf may in particular be a leaf situated underneath the leaf onto which the bolt is mounted so that both leaves can be opened and closed together when they are fixed to one another by means of the bolt or the upper first leaf can be opened separately, for example in the case of a door for a horse stable, when the bolt is released.

[0024] Preferably, the handle 6 is mounteable to the bolt 5 in a plurality of distances relative to the distal extremity of the bolt 5 since a number of holes are provided in the bolt 5 which enable to fix the handle 6 by means of the screw 23 at the location of these holes to the bolt 5. In this way, it is possible to modify the position of the handle 6 relative to the bolt 5 and consequently to adapt the length of the portion of the bolt projecting from the housing 3 to the corresponding element fixed to the wall, floor or other leaf, with which said portion cooperates when the bolt is in its extended position.

[0025] The sliding bolt locking device 1 further comprises a locking mechanism 8 which is operateable, preferably via a key, from one end of the housing 3, namely from the upper part 3b of the housing 3. The locking mechanism 8 is provided to lock the bolt 5 at least in its extended position, and preferably in its extended and in its retracted position.

[0026] Figure 2 shows a sliding bolt locking device 1 where part of the housing 3 and bolt 5 is cut away to show the elements inside. Figure 2 more particularly shows an intermediary locking element 9 which is part of the locking mechanism 8 and which extends from one end of the housing 3 where the locking mechanism 8 is operateable (hereafter locking end of the housing) towards the bolt 5. The intermediary locking element 9 has a length so that it continuously engages the bolt 5, i.e. even when the bolt 5 is in its utmost extended position (extended

position + the handle being mounted to the bolt so that the bolt maximally extends from the housing). The intermediary locking element 9 consequently also engages the bolt when the bolt is retracted, since the bolt is then closer to the locking end of the housing.

[0027] The intermediary locking element 9 is coupled to the bolt 5 in such a manner that the intermediary locking element 9 can slide along the longitudinal axis L with respect to the bolt 5 whilst the bolt 5 can be prevented by the intermediary locking element 9 from rotating with respect to the intermediary locking element 9. In the preferred embodiment shown in figure 2, the intermediary locking element 9 has a lower extremity with a non-circular, more particularly a square cross-sectional shape while the bolt is provided with a hole 24 which extends in the longitudinal direction of the bolt (along said longitudinal axis L) and which has a corresponding non-circular, more particularly a square cross-sectional shape. In practice, the hole 24 does not need to show said non-circular cross-sectional shape over its entire length but the hole 24 may be provided only locally with this non-circular cross-sectional shape by mounting (f.e. welding) on the top end of the bolt a cover plate having a non-circular opening in it, whereby the cover plate is arranged with respect to the bolt so that the square opening of the cover plate is aligned with the hole 24 in the bolt (which may then for example be a cylindrical boring which is much easier to apply in the bolt). In such configuration of a non-circular intermediary locking element and a bolt with corresponding non-circular opening, the bolt 5 can freely slide with respect to the intermediary locking element 9 in the longitudinal direction of the bolt while a rotation of the bolt 5 around the longitudinal axis is transmitted to the intermediary locking element 9. A rotation of the bolt 5 will result in a corresponding rotation of the intermediary locking element 9 and visa versa thereby obtaining a forced simultaneous rotational movement of the bolt 5 and the intermediary locking element 9 (i.e. the bolt 5 being locked in rotation with respect to the intermediary locking element 9).

[0028] It will be clear that other configurations of bolt 5 and intermediary locking element 9 can be found which result in this same forced simultaneous rotational movement while allowing the bolt 5 to slide with respect to the intermediary locking element 9 in the longitudinal direction. For example an irregular cross-section or a triangular cross-section can be provided. Also the intermediary locking element can be provided with the hole wherein an extremity of the bolt slideably engages. Therefore, the present invention is not limited to the shown embodiment.

[0029] Figure 3 shows the inside elements at the locking end of the housing, with the upper part 3b of the housing 3 removed. Figure 3 furthermore shows the upper extremity of the bolt 5 and the intermediary locking element 9 slideably connected to the bolt 5. Figure 3 also shows a locking element 10 which is reciprocally moveable along said longitudinal axis L (in other words in the longitudinal direction of the bolt 5) between an unlocking position (figure 3A) and a locking position (figure 3B). The locking element 10 is made of a metal plate folded according to a U-shape. The legs of this U-shape extend laterally beyond the bottom part wherein a non-circular opening 16 is provided, and are slideably guided in the upper part 3b of the housing 3. One of the legs is provided with a hole 11 arranged to co-operate with the driving dog 12 of a key operated lock cylinder 13 (preferably a Euro-cylinder) which is mounted in the upper part 3b of the housing 3 so that when rotating the key operated cylinder in the clockwise direction the locking element 10 is lifted (figure 3A) and when rotating the key operated cylinder in the anti-clockwise direction, the locking element 10 is lowered (figure 3B).

[0030] The intermediary locking element 9 is arranged with respect to the locking element 10 such that, in its locked position, the intermediary locking element 9 extends with a first, non-circular section 14 through the non-circular, more particularly square opening 16 in the locking element 10. The outer shape of the first section 14 of the intermediary locking element 9 and the shape of the opening in the locking element 10 correspond to one another so that at least in the locked position of the intermediary locking element 9, wherein the first section 14 of this intermediary locking element 9 is located in the opening of the locking element 10, a rotation of the intermediary locking element 9 relative to the locking element 10 is prevented. This locked position is shown in figure 3B. In the shown embodiment this locked position is the position wherein the locking element 10 is lowered with respect to the intermediate locking element 9. In the lifted position of the locking element 10, shown in figure 3A and also referred to as the unlocking position, the square opening 16 is situated around a second section 15 of the intermediary locking element 9 where the latter is rounded off so that it can rotate in the square opening 16.

[0031] The intermediary locking element 9 thus shows two sections 14 and 15 lying adjacent to each other. In the first section 14, the intermediary locking element 9 is provided with a cross-sectional shape that corresponds to the cross-sectional shape of the opening 16 in the locking element 10 such that when this section of the intermediary locking element 9 is positioned in the opening 16, no noteworthy rotation is possible of the intermediary locking element 9 relative to the locking element 9. In the second section 15, the intermediary locking element 9 is provided with cross-sectional shape that is rotateable in the opening 16 in the locking element 10. This can be achieved by rounding off edges or by making the cross-sectional shape of the second section 15 smaller than the cross-sectional shape of the first section 14. The locking element 10 is positioned relative to the intermediary locking element 9 such that the opening is reciprocally moveable from the one section 14 to the other section 15.

[0032] Other embodiments can be found which result in a similar technical effect. For example one could arrange the elements so that the intermediary locking element 9 is reciprocally moveable in the longitudinal direc-

tion with respect to a fixed opening 16 thereby achieving the same effect.

[0033] Figure 3 shows the intermediary locking element 9 being provided with a lateral protrusion 17. In practise, such protrusion can be formed by providing a hole through the intermediary locking element 9 and mounting in the hole a little bar protruding on at least one side, preferably two sides from the intermediary locking element 9. This lateral protrusion 17 provides in a means for holding the intermediary locking element 9 fixed in the longitudinal direction while allowing a rotation of the intermediary locking element 9 around the longitudinal axis.

[0034] Figure 4 shows the upper part 3b of the housing 3 from the rear side where the sliding bolt locking device is mounted to the frame 2, and a rear cover plate of the housing being cut away to see the inside elements in a mounted position relative to the housing. The figure shows the housing 3 wherein the key-operated lock cylinder 13 is mounted via a screw 19 applied through a hole in the upper part 3b of the housing 3. The lock cylinder 13 shows the driving dog 12 which is moveable by rotating a key (not shown) in the lock cylinder 13. The figure furthermore shows the U-shaped locking element 10 being moveably mounted in the housing 3 so that it can move up and downwards but so that it is prevented from rotating in the housing 3. The U-shaped locking element 10 is provided with the non-circular opening 16 and the hole 11 for the driving dog 12 of the lock cylinder 13..

[0035] Figure 4 shows the protrusion 17 of the intermediary locking element 9 which is received in a transverse guide 18 in the housing. The guide 18 is formed as a disk-shaped space in the housing, the disk being arranged perpendicular to the longitudinal axis and being substantially centred around this axis. Such configuration provides a simple technical solution for allowing the intermediary locking element 9 to freely rotate around the longitudinal axis, while in the longitudinal direction, keeping the intermediary locking element 9 fixed in one position. It will be clear that the outer form of the disk-shaped space is not relevant for its operation and can be formed for example square.

[0036] The sliding bolt locking device 1 according to the invention can be operated as follows. Figure 5 shows a top view of the device 1, and shows three possible positions of the handle 6. In the central position, referred to with No. 20, the handle 6 is positioned in the slot 4. In this position, the bolt 5 can be freely moved from the retracted to the extended position since the handle is located in the slot 4. When the bolt is in the retraced or in the extended position, the handle can be moved into a notch 7 by rotating the bolt 5 around the longitudinal axis L. By such rotation, the handle rotates, viewed in the figure 5, from the central position referred to with No. 20 to a left position 21 or to a right position 22, depending on the side to which the bolt 5 is rotated. In this left position 21 or right position 22, the bolt can not slide reciprocally from the retracted to the extended position since the handle, fixed to the bolt and extending through the housing, is located in said notch. In the left position 21 or right position 22, the bolt is longitudinally blocked.

[0037] The intermediate locking element 9 is slideably and substantially irrotateably connected to the bolt 5 so that the intermediate locking element 9 allows the bolt 5 to longitudinally slide yet prevents the bolt 5 to rotate around the longitudinal axis relative to the intermediary locking element 9. A rotation of the bolt 5 will therefore result in a simultaneous corresponding rotation of the intermediary locking element 9.

[0038] By key-operating the cylinder 13 in the locking mechanism 8, the locking element 10 is moved reciprocally from a position where it blocks the rotation of the intermediary locking element 9 to a position where the intermediary locking element 10 can freely rotate around the longitudinal axis. Particularly the locking element 10 has a square opening that fits around the square intermediary locking element 9 when the square of the intermediary locking element 9 is aligned with the square opening in the locking element 10. The elements 9 and 10 are arranged relative to each other so that, preferably, when the handle is in the notch and when the handle is in the slot, the squares are aligned. Thereby referring to the figure 5, the squares of the locking element 10 and the intermediary locking element 9 are aligned when the handle 6 is in the central position 20 and when the handle 6 is in the left position 21 and when the handle 6 is in the right position 22. This enables the sliding bolt locking device 1 to be locked in any of these positions 20, 21 and 22. Although, when the bolt is in the left or right position 21 22, the locking element 10 blocks the intermediary locking element 9 from rotating, yet indirectly the locking element 10 blocks the bolt 5 from sliding because the bolt needs to rotate out of the notch 7 before it can slide in the slot 4. Once the handle is in the central position 20, the bolt can freely slide even when in this position the locking element 10 prevents the intermediary locking element 9 from rotating.

Claims

1. A sliding bolt locking device (1) comprising a housing (3) provided with a slot (4), a bolt (5) moveably arranged in said housing (3) to slide along a longitudinal axis (L) between an extended and a retracted position, a handle (6) fixed transversely to said bolt (5) and projecting out of said housing (3) through said slot (4) to slide in said slot (4), and a locking mechanism (8) arranged to lock said bolt (5) at least in its extended position, **characterised in that** said housing (3) is further provided with a first transverse notch (7a) which opens out in said slot (4) and which is arranged to receive said handle (6) in the extended position of the bolt (5) by a rotation of said bolt (5) about said longitudinal axis (L), and **in that** said lock-

ing mechanism (8) comprises an intermediary locking element (9), which is rotateably mounted in said housing (3) around said longitudinal axis (L), and a locking element (10) which is moveable relative to said intermediary locking element (9) between a locking position and an unlocking position wherein, in said locking position, the locking element (10) locks the intermediary locking element (9) against rotation, the intermediary locking element (9) being slideably coupled to said bolt (5) in such a manner as to prevent, in the locking position of the locking element (10), the handle (6) of said bolt (5), when being located in said first transverse notch (7a), from rotating out of said first transverse notch (7a) and to enable, in the unlocking position of the locking element (10), the handle (6) of said bolt (5) to rotate out of said first transverse notch (7a) into said slot (4).

2. A lock according to claim 1, wherein in its unlocking position the locking element (10) allows the intermediary locking element (9) to rotate.

3. A lock according to claim 1 or 2, wherein said locking element (10) is reciprocally operateable in a direction parallel to said longitudinal axis (L) from the locking position to the unlocking position by means of a key-operated lock cylinder (13).

4. A lock according to any one of the previous claims, wherein said bolt (5) is substantially cylindrical.

5. A lock according to any one of the previous claims, wherein said housing (3) is provided with a second transverse notch (7b) opening out in said slot (4) and arranged to receive said handle (6) in the retracted position of said bolt (5) by a rotation of said bolt (5) about said longitudinal axis (L).

6. A lock according to claim 5, wherein said handle (6) is fixed to said bolt (5) by means of a screw (23) passing through said bolt (5), said housing (3) being provided with a third transverse notch (7c), which is located on the other side of said slot (4) than said first transverse notch (7a), and which is arranged to receive said handle (6) in the extended position of the bolt (5), and with a fourth transverse notch (7d), which is located on the other side of said slot (4) than said second transverse notch (7b), and which is arranged to receive said handle (6) in the retracted position of the bolt (5), the fourth transverse notch (7d) being opposite said second transverse notch (7b) to enable to release said screw (23) when the handle (6) is in the second notch (7b) and the third transverse notch (7c) being longitudinally shifted with respect to the first transverse notch (7a) so that said screw (23) is not releasable through said third transverse notch (7c) when the handle is in said first transverse notch (7a).

7. A lock according to any one of the previous claims, wherein said intermediary locking element (9) has a lower extremity with a non-circular cross-sectional outer shape and said bolt (5) has a hole (24) which extends along said longitudinal axis (L), which is arranged to slideably receive said lower extremity of said intermediary locking element (9) and which has at least locally a non-circular cross-sectional shape which substantially corresponds to said non-circular cross-sectional shape of the lower extremity of said intermediary locking element (9), in such a manner that rotation of the intermediary locking element (9) relative to the bolt (5) is prevented, or, wherein said bolt (5) has an upper extremity with a non-circular cross-sectional outer shape and said intermediary locking element (9) has a hole which extends along said longitudinal axis (L), which is arranged to slideably receive said upper extremity of said bolt (5) and which has at least locally a non-circular cross-sectional shape which substantially corresponds to said non-circular cross-sectional shape of the upper extremity of said bolt (5), in such a manner that rotation of the bolt (5) relative to the intermediary locking element (9) is prevented.

8. A lock according to claim 7, wherein said cross-sectional shape is a regular polygonal shape with N corners, N being an integer from 3 to 6.

9. A lock according to claim 8, wherein at least said first transverse notch (7a) has a depth so that the handle (6) rotates about the longitudinal axis over 360/N degrees when rotating from said slot (4) to the bottom of said first transverse notch (7a).

10. A lock according to any one of the previous claims, wherein said locking element (10) comprises a non-circular opening (16) arranged to receive, in its locking position, a first section (14) of said intermediary locking element (9), which first section (14) has a further non-circular cross-sectional shape so that, in said locking position, said first section (14) of said intermediary locking element (9) is located in said opening and prevented from rotating with respect to said locking element (10).

11. A lock according to claim 10, wherein in said unlocking position, a second section (15) of said intermediary locking element (9), having a shape enabling said second section (15) to rotate in said opening (16) in the locking element (10), is located in said opening (16).

12. A lock according to any of the previous claims, wherein said intermediary locking element (9) comprises a lateral protrusion (17) which is received in a transverse guide (18) to keep the intermediary locking element (9) in one longitudinal position.

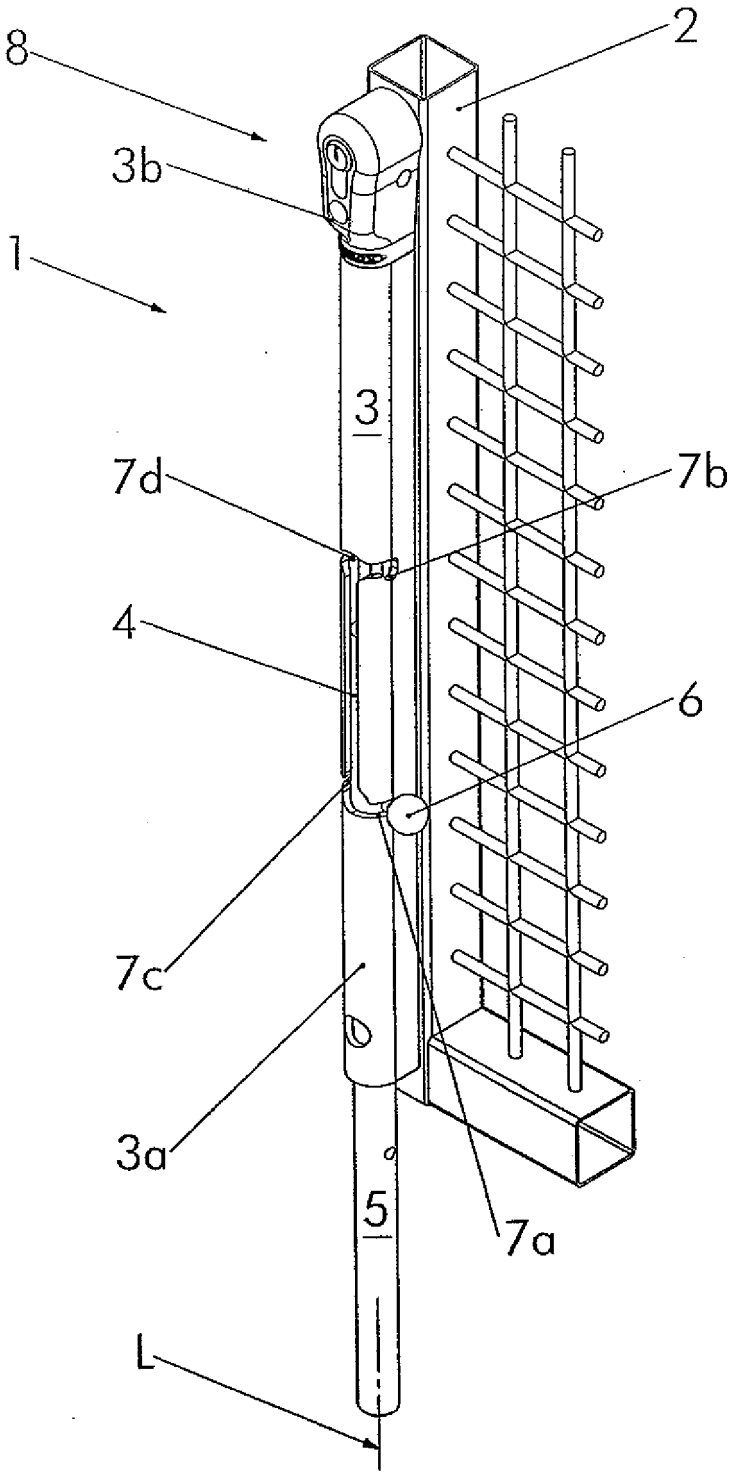

Fig 1

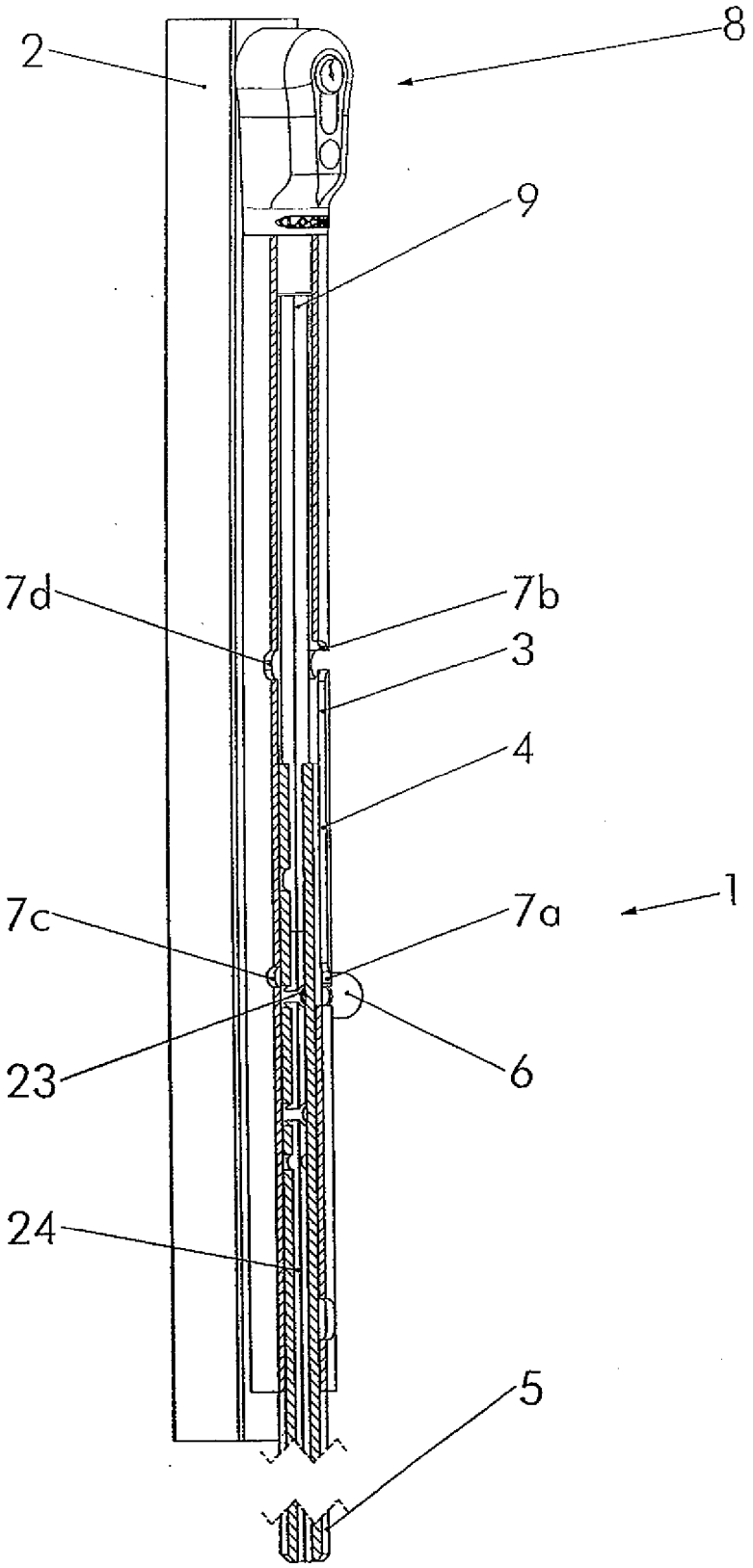

Fig 2

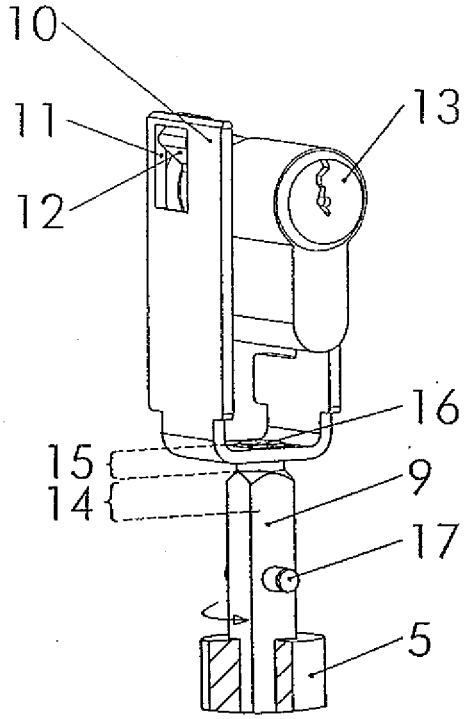

Fig 3A

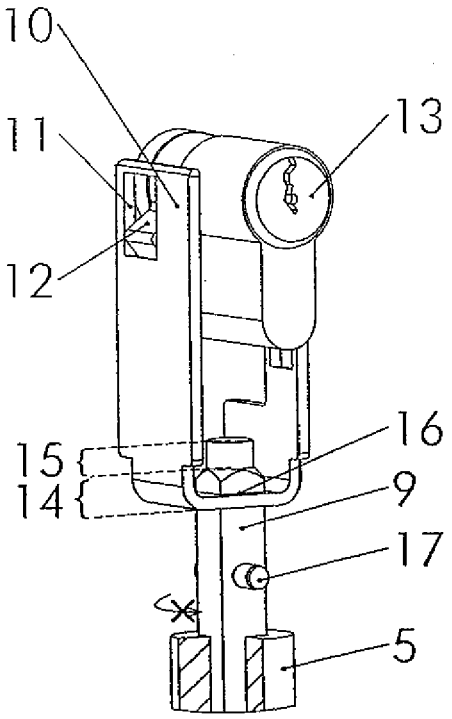

Fig 3B

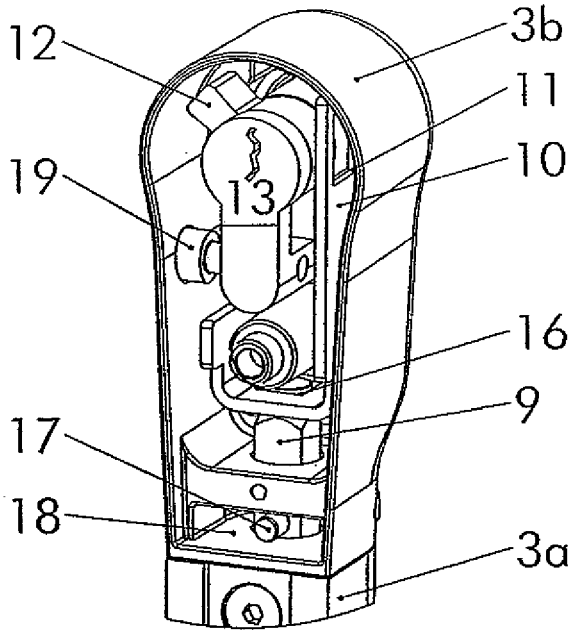

Fig 4

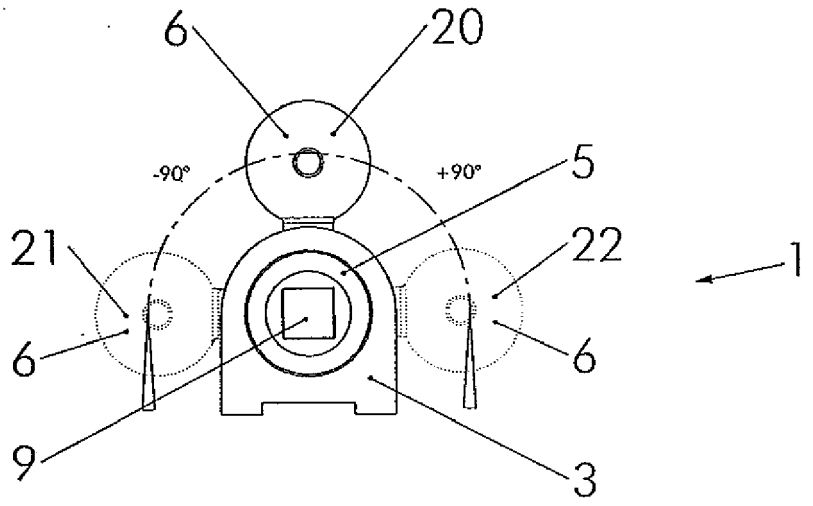

Fig 5

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EUROPEAN SEARCH REPORT

Application Number
EP 11 15 0749

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 195 695 A (COTON BERT) 13 April 1988 (1988-04-13) * sentence 104 - sentence 123 * * figure 1 * -----	1	INV. E05C1/04 E05B17/20
A	AU 2009 201 769 A1 (AUSTRAL LOCK P L) 26 November 2009 (2009-11-26) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

E05C
E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 July 2011	Bitton, Alexandre

CATEGORY OF CITED DOCUMENTS

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19-07-2011

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