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(54) **LOCKING DEVICE FOR WINDOWS AND DOORS**

VERRIEGELUNGSVORRICHTUNG FÜR FENSTER UND TÜREN

DISPOSITIF DE VERROUILLAGE POUR FENÊTRES ET PORTES

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(74) Representative: **Cabinet Plasseraud**

**66, rue de la Chaussée d'Antin
75440 Paris Cedex 09 (FR)**

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(73) Proprietor: **Dong, Zhijun**

Ning Bo 315177 (CN)

(72) Inventor: **Dong, Zhijun**

Ning Bo 315177 (CN)

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Description

FIELD OF THE INVENTION

[0001] This invention relates to a locking component and device, in particular, locking devices for tilting roof windows and doors having a ventilation flap actuating a lock, such as those including a gear and teeth arrangement.

DESCRIPTION OF THE PRIOR ART

[0002] Inclined roof windows are adapted for inclined roofs, which can provide an abundance of sunshine for buildings and brighten interiors.

[0003] In the prior art, for example, a window includes an inside window frame and an outside window sash structure, i.e., a pivotally mounted glass window structure, wherein the inside window frame is mounted on the wall or the roof, while one end of the outside window sash is pivotally connected with the inside window frame, and the other end can be opened or closed by a locking stay device.

[0004] In door or window designs of the prior art, especially, for roof windows having a frame structure and a sash structure in order to have suitable ventilation when the window or door is locked, a classic design is to simultaneously set a hinge relative to a hinge set vertically or horizontally. This can be used to open or close the door or window, such that they can be adjustably placed in different positions under the hinge's actuation mechanism.

[0005] In order to allow proper and suitable ventilation between the interior and exterior areas of a building, most inclined roof windows are designed to be opened and closed at will by users.

[0006] A simple and elegant design includes that of a small door or window opening, i.e., a ventilation passage, interconnecting the interior and the exterior areas, combined with the door or window, which make it possible to open or close the ventilation opening embedded in doors or windows, so as to achieve an efficient exchange of air and ventilation between the interior and the exterior areas.

[0007] In the prior art related to roof windows, references DE6903921 as well as EP0458725B1 show known structures and mechanisms for achieving air ventilation between exterior and interior areas and as well as present cover members which can pivot in a single direction designed to be connected with a window sash by a locking device. When the window sash is on a locked position relative to the main window frame, this cover member may pivot in a single direction so as to open or close the air passage, while driving a control member connected to a specially designed lock device, allowing the control member to be placed in various positions, such as three different positions. When placed in different positions, the pawls of the lock device are driven accordingly, so

as to open or close the window at the same time the ventilation opening is opened or closed when the sash is closed.

[0008] For example, in the design described in WO2007/009685, many disadvantages are visible. Costs are high and manufacturing processes are complicated, thus lock devices such as belonging to this design has definite disadvantages.

[0009] In this prior art design, in order to slide among three different positions, the cover member is connected with the control member by using springs on different pivot points, but in such designs, different metal components clash with each other, thus generating undesirable noise when actuated and used. Some improvements have been proposed for this type of lock device such as in EP053881157 and DKPA200600968, which invariably adds further cost and is subject to wear and tear issues with long term usage. Thus, with long term usage, the problems associated with noise may return as well.

[0010] For instance, because the pivot is set under a cover member, when the cover member is opened and on a ventilation position, the cover member is connected with the sliding control member, while the opening angle of the cover member corresponds to the sliding distance. Therefore, the ventilation angle cannot be too large, while in order to facilitate the usage, its pivot can only be arranged under the cover member. Accordingly, the cover member is positioned so that it blocks the air exchange direction between the interior and the exterior spaces, resulting in an undesirable air exchange effect and low efficiency.

[0011] Further, this design poses a native and inherent defect. Since the ventilation cover member, i.e., the top ventilation member, connected with the lock system controls the opening of the air passage between the interior and the exterior areas, it is very likely that the window can be opened by acting on the ventilation cover member with a thin steel wire or other elements through the ventilation passage. This increases the possibility of unauthorized entries and penetration such as house burglaries and the like.

[0012] The following known mechanisms (DK2002/000235, WO02/084043, WO99/51832, WO99/10610) propose to partially block the ventilation member (top member) from the exterior area, reducing the possibility of burglaries from occurring, while undesirably increasing the cost and reducing the ventilation effect.

[0013] In WO2009/141447A1, the ventilation member additionally has a self-lock function, whereas in WO2002/08043, this device should be activated manually. However, manual activation can be easily forgotten by a user, making it inconvenient to use, posing further dangers, and resulting in higher costs.

[0014] For the opening and closing processes, various types of locks and/or locking control mechanisms may be provided. The efficient and smart use of a lock has a direct impact on the efficiency of inclined roof windows.

[0015] Classically speaking, the locking stay device contains a bar-shaped locking element which includes a cylindrical pin and a locking device, wherein the bar-shaped locking element is pivotally connected with the outside window sash, on which there are a plurality of position pawls, and the cylindrical pin is arranged on the inside window frame, which cooperates with the position pawls to adjust the opening of a vent, when closed, the inside window frame and the outside window sash is tightly connected by turning the locking stay device with a handle.

[0016] There are some disadvantages existing in the structure mentioned above. First, the vent opening adjustment device is detached from the locking stay device which results in more parts, difficulty in assembling, higher manufacturing cost, and annoying operation. Secondly, bar-sharp locking element includes pawls which affect the mechanical strength of the locking element. Moreover, the locking element is easy to slip from the cylindrical pin thereby affecting position and the use.

[0017] Various locking devices have been proposed as well as such as one which include a tilting sash on which is mounted an actuation assembly movable in translation and including a handle bar as well as a gear mechanism which converts a translation movement of an actuator element into a rotational movement of locking elements (EP 1746232B1).

[0018] Such mechanism utilizes a magnetic means to actuate the locking elements, which may pose other inherent problems of long term usage and wear and tear. Other prior art propose similar mechanisms such as EP 1762679A1, describing an assembly for securing a closure member in a closed position including the use of attractive magnets. Furthermore, prior art locking devices typically use at least two hinged levers and two return springs as linking mechanism between the actuation slider and a latching hook. However, the disadvantages of this design include the number of components and complexity of the design mechanism.

SUMMARY OF THE INVENTION

[0019] In light of prior art mentioned above, the technical problem that the present invention intends to solve is to provide a ventilation system for windows or doors, which combines a novel and inventive ventilation opening adjustment and locking mechanism that is simpler and requires fewer components.

[0020] In order to solve the aforementioned technical problems and overcome some of the inherent problems found in the prior art, the present invention, in one aspect, includes a lock assembly used on a roof ventilating windows or doors comprising a locking device having a casing designed to be mounted on a sash which is arranged to tilt pivotally inside a main frame of the window or the door, a strike plate designed to be mounted on the main frame of the window to be located opposite the casing when the sash is in a closed position, having a pair of

stationary latching members, a pair of latching hooks mounted on the casing and arranged to pivot about two respective rotation axis sensibly parallel to each other, with each latching hook being able to pivot between a locking position in which each latching hook is in a locking engagement with respective stationary latching members to lock the sash in the closed position and an unlocking position in which each latching hook disengages from the respective stationary latching members to allow opening of the window or the door. Further, the locking device includes an actuation slider arranged at least partly in the casing between the two rotation axis of the latching hooks and mounted to slide in translation along a sliding direction D sensibly perpendicular to the rotation axis with the actuation slider being linked to the latching hooks so that the translation motion of the actuation slider entails a pivoting motion of the latching hooks.

[0021] The present invention further includes each of the latching hooks being mounted on a pair of corresponding pinions which is mounted rotatable inside the casing and has the same rotation axis as the latching hook, and the actuation slider includes at least two laterally opposed rack portions which respectively engage with the pair of corresponding pinions.

[0022] In another aspect, the locking assembly further includes the casing having a top shell and a bottom shell and the pair of latching hooks being located on a top wall of the top shell and mounted on the pair of corresponding pinions via a pair of corresponding connecting pins which traverse the top wall.

[0023] In yet another aspect, the respective stationary latching members include at least partly the shape of a cylinder having a longitudinal axis which at least approximately coincides with the rotation axis of the latching hooks when the sash is in a close position. Further, the longitudinal axis of the stationary latching members and the rotation axis of the latching hooks are slightly misaligned, the misalignment being approximately 1 mm.

[0024] In another aspect, the latching hooks comprise a wall having a front wall portion and a rear wall portion forming an angle, the front wall portion and rear wall portion each presenting a substantially flat interior surface arranged parallel to the rotation axis of the latching hooks. Additionally, the distance between the interior surface of the front wall portion and the rotation axis is less than a distance between the interior surface of the rear wall portion and the rotation axis. Moreover, the interior surface of the front wall portion of the latching hook joins a slanted end surface of the front wall portion.

[0025] In yet another aspect, the latching hooks which are mounted on the pair of corresponding pinions are removable from the corresponding pinions without having to open or dismount the casing into the top and bottom shells. The latching hooks may be removable by force from the corresponding pinions as well as being removable by screws.

[0026] Furthermore, in another aspect of the invention, the actuation slider traverses a front opening of the casing

and includes a front portion positioned outside the casing and hinged to a driving rod. And the bottom shell of the casing includes a guiding slot in which the actuation slider is arranged to slide and the actuation slider has an oblong opening which is traversed by a slanted cylinder.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027]

Figure 1 is a schematic diagram of a locking device according to the present invention.

Figure 2 shows another view of the locking device of FIG. 1 on a perspective side view.

Figure 3 shows another perspective schematic diagram of the locking device.

Figure 4 shows a schematic diagram of a top cover of the locking device.

Figure 5 shows a schematic diagram of a latching hook.

Figure 6 shows a schematic diagram of a bottom view of the locking device.

Figure 7 shows a schematic diagram of a top view of the locking device.

DETAILED DESCRIPTION OF THE INVENTION

[0028] Referring to Figures 1 and 2, a locking device 15 according to the present invention is shown. The locking device 15 may be used in a window arrangement or a door. When used in windows, the locking device 15 may be used with tilting roof windows.

[0029] Referring specifically to Figure 2, the locking device 15 includes a casing 10 and a strike plate 20. The casing 10 is designed to be mounted on a window or door sash which is arranged to tilt pivotally inside a main frame of the window or the door. The casing 10 has two parts, a top shell 12 and a bottom shell 14, which are connected to each other to form the integral casing 10.

[0030] The top shell 12 and the bottom shell 14 may be connected via a mechanical connection whereby the two parts may be snapped into place by force or by a sealing mechanism or by fastening means such as screws. The strike plate 20 is designed to be mounted on the main frame of the window or the door to be located opposite the casing 10 when the sash is in a closed position.

[0031] The top shell 12 includes a top wall 16. The top wall 16 holds a pair of latching hooks 26 and 28 held together against the top wall 16 by a pair of corresponding connecting pins 44 and 46. The connecting pins 44 and 46 traverse the top wall 16. The top shell 12 of the casing 10 also includes a front portion 33 which is positioned outside the top shell 12 of the casing 10. The front portion 33 is attached pivotally and hinged to a driving rod 5.

[0032] Referring now to Figure 2, a perspective side view of the locking device 15 is shown. In this illustration, the strike plate 20 and the casing 10 are shown together

in a locking arrangement. The strike plate 20 includes a pair of stationary latching members 22 and 24, which are mechanically engaged with the pair of latching hooks 26 and 28 of the casing 10. The pair of latching hooks 26 and 28 is mounted on the casing 10 and are arranged to pivot about two respective rotation axis, axis A1 and axis A2, which are sensibly parallel to each other.

[0033] The stationary latching members 22 and 24 include at least partly the shape of a cylinder having a longitudinal axis A3 and axis A4. The longitudinal axis A3 and A4 approximately coincide with the rotation axis A1 and A2 of the latching hooks 26 and 28 when the sash is in a close position. The longitudinal axis A3 and A4 of the stationary latching members and the rotation axis A1 and A2 of the latching hooks are slightly misaligned, and this misalignment may be about approximately in the range of about 1 mm.

[0034] Referring now to Figure 3, the locking device 15 is shown with the strike plate 20 and the top shell 12 of the casing 10 removed. In this Figure, the bottom shell 14 is shown in greater detail. An actuation slider 30 is shown including rack portions 32 and 34. The bottom shell 14 also includes a pair of corresponding pinions 40 and 42 which are connected to the latching hooks 26 and 28 via the pins 44 and 46.

[0035] Still referring to Figure 3, the mechanism of a gear and teeth arrangement to actuate the locking device 15 is shown. Each of the latching hooks 26 and 28 is mechanically positioned to pivot between a locking position in which each latching hook 26 and 28 is in a locking engagement with the respective stationary members 22 and 24 of the strike plate 20 to lock the sash in the closed position. The latching hooks 26 and 28 are also in an unlocking position in which each latching hook disengages from the respective latching members 22 and 24 to allow opening of the window or the door.

[0036] The actuation slider 30 can be seen as being arranged at least partly in the casing 10 between the two rotation axis A1 and A2 of the latching hooks 26 and 28 and mounted to slide in translation along a sliding direction D sensibly perpendicular to the rotation axis A1 and A2. The actuation slider 30 is mechanically linked to the latching hooks 26 and 28 so that the translation motion of the actuation slider 30 entails a pivoting motion of the latching hooks 26 and 28.

[0037] Furthermore, each of the latching hooks 26 and 28 is mounted on the corresponding pinions 40 and 42 which is mounted rotatable inside the casing 10 and has a same rotation axis A1 and A2 as the latching hook. And the actuation slider 30 includes the two laterally opposed rack portions 32 and 34 which respectively engage with the pair of corresponding pinions 40 and 42.

[0038] Still referring to Figure 3, the latching hooks 26 and 28 mounted on the pair of corresponding pinions 40 and 42 are removable from the corresponding pinions 40 and 42 without having to open or dismount the casing 10 into the top shell 12 and bottom shell 14. Each of the latching hooks 26 and 28 can be removable by force from

the corresponding pinions. This provides the added advantage that without opening the casing 10, a worn hook or component can be easily replaced.

[0039] Referring now to Figure 4, the top shell 12 is shown. A bottom wall 21 of the top shell 12 illustrates the position of the corresponding pinions 40 and 42.

[0040] The actuation slider 30 (not shown) traverses a front opening 19 of the casing 10 and includes the front portion 33 positioned outside the casing and hinged to a driving rod 5 (shown in Figures 1-3). Referring now to Figure 3, the bottom shell 14 of the casing 10 includes a guiding slot 18 in which the actuation slider 30 is arranged to slide. The actuation slider 30 also includes an oblong opening 50 which is traversed by a slanted cylinder 52.

[0041] Referring now to Figure 5, details of one of the latching hooks, i.e., latching hook 26, are shown and described in greater detail.

[0042] For exemplary purposes, the latching hook 26 comprises a wall having a front wall portion 100 and a rear wall portion 110. The front and rear wall form an angle. Furthermore, the front wall portion 100 and the rear wall portion 110 form a substantially flat interior surface 130 and 140 which are parallel to the rotation axis A1 of the latching hook 26. Moreover, the distance between the interior surface 130 of the front wall portion 100 and the rotation axis A1 is less than the distance between the interior surface 140 of the rear wall portion 110 and the rotation axis A1. Additionally, the interior surface 130 of the front wall portion 100 of the latching hook joins a slanted end surface 150 of the front wall portion 100.

[0043] Referring now to Figure 6, a schematic view of the locking device 15 is shown, in particular, a bottom wall 71 of the bottom shell 14 is illustrated.

[0044] Referring now to Figure 7, a top view of the locking device 15 is shown with the configuration including the top wall 16 of the top shell 14 showing the latching hooks 26 and 28, the cylinder 52, the front portion 33 and the driver 5.

Claims

1. A lock assembly used on roof ventilating windows or doors comprising a locking device having:

a casing (10) designed to be mounted on a sash which is arranged to tilt pivotally inside a main frame of the window or the door,
a strike plate (20) designed to be mounted on the main frame of the window to be located opposite the casing (10) when the sash is in a closed position, having a pair of stationary latching members (22, 24),
a pair of latching hooks (26, 28) mounted on the casing (10) and arranged to pivot about two respective rotation axis (A1, A2) sensibly parallel to each other,

each latching hook (26, 28) being able to pivot between a locking position in which each latching hook (26, 28) is in a locking engagement with respective stationary latching members (22, 24) to lock the sash in the closed position and an unlocking position in which each latching hook disengages from the respective stationary latching members to allow opening of the window or the door,

an actuation slider (30) arranged at least partly in the casing (10) between the two rotation axis (A1, A2) of the latching hooks (26, 28) and mounted to slide in translation along a sliding direction (D) sensibly perpendicular to the rotation axis (A1, A2), the actuation slider (30) being linked to the latching hooks (26, 28) so that the translation motion of the actuation slider entails a pivoting motion of the latching hooks, **characterized in that**

each of the latching hooks (26, 28) is mounted on a pair of corresponding pinions (40, 42) which is mounted rotatable inside the casing (10) and has the same rotation axis (A1, A2) as the latching hook, and

the actuation slider (30) comprises at least two laterally opposed rack portions (32, 34) which respectively engage with the pair of corresponding pinions (40, 42).

2. The locking assembly of claim 1 **characterized in that** the casing (10) comprises a top shell (12) and a bottom shell (14) and the pair of latching hooks are located on a top wall (16) of the top shell (12) and is mounted on the pair of corresponding pinions via a pair of corresponding connecting pins (44, 46) which traverse the top wall.
3. The locking assembly of claims 1 or 2, **characterized in that** the respective stationary latching members (22, 24) comprise at least partly the shape of a cylinder having a longitudinal axis (A3, A4) which at least approximately coincides with the rotation axis (A1, A2) of the latching hooks when the sash is in a close position.
4. The locking assembly of any one of the preceding claims, **characterized in that** the longitudinal axis (A3, A4) of the stationary latching members and the rotation axis (A1, A2) of the latching hooks are slightly misaligned, the misalignment being approximately 1 mm.
5. The locking assembly of any one of the preceding claims, **characterized in that** the latching hooks comprise a wall having a front wall portion (100) and a rear wall portion (110) forming an angle, the front wall portion and rear wall portion each presenting a substantially flat interior surface (130, 140) arranged

parallel to the rotation axis of the latching hooks, a distance between the interior surface (130) of the front wall portion (100) and the rotation axis being less than a distance between the interior surface (140) of the rear wall portion (110) and the rotation axis.

6. The locking assembly of any one of the preceding claims, **characterized in that** the interior surface of the front wall portion (100) of the latching hook joins a slanted end surface (150) of the front wall portion.
7. The locking assembly of any one of the preceding claims, **characterized in that** each of the latching hooks (26, 28) mounted on the pair of corresponding pinions (40, 42) are removable from the corresponding pinions without having to open or dismount the casing (10) into the top (12) and bottom shells (14).
8. The locking assembly of claim 7, **characterized in that** each of the latching hooks (26, 28) are removable by force from the corresponding pinions.
9. The locking assembly of any one of the preceding claims, **characterized in that** the actuation slider (30) traverses a front opening (19) of the casing (10) and includes a front portion (33) positioned outside the casing and hinged to a driving rod (5).
10. The locking assembly of any one of the preceding claims, **characterized in that** the bottom shell (14) of the casing includes a guiding slot (18) in which the actuation slider (30) is arranged to slide.
11. The locking assembly of any one of the preceding claims, **characterized in that** the actuation slider has an oblong opening (50) which is traversed by a slanted cylinder (52).

Patentansprüche

1. Verriegelungsanordnung, die an Dachlüftungsfenstern oder -Türen verwendet wird, die eine Verriegelungsvorrichtung aufweisen, mit:

einem Gehäuse (10), das dazu bestimmt ist, an einem Flügelrahmen angebracht zu werden, der eingerichtet ist, schwenkend innerhalb eines Hauptrahmens des Fensters oder der Tür zu kippen, einem Schließblech (20), das dazu bestimmt ist, am Hauptrahmen des Fensters angebracht zu werden, um gegenüber dem Gehäuse (10) angeordnet zu werden, wenn sich der Flügelrahmen in einer geschlossenen Position befindet, das ein Paar feststehende Arretierungselemente (22, 24) aufweist,

einem Paar Arretierungshaken (26, 28), die am Gehäuse (10) angebracht und eingerichtet sind, um zwei jeweilige Drehachsen (A1, A2) zu schwenken, die im Wesentlichen parallel zueinander sind,

wobei jeder Arretierungshaken (26, 28) imstande ist, zwischen einer Verriegelungsposition, in der sich jeder Arretierungshaken (26, 28) in einem Verriegelungseingriff mit jeweiligen feststehenden Arretierungselemente (22, 24) befindet, um den Flügelrahmen in der geschlossenen Position zu verriegeln, und einer Entriegelungsposition zu schwenken, in der sich jeder Arretierungshaken von den jeweiligen feststehenden Arretierungselemente löst, um das Öffnen des Fensters oder der Tür zu ermöglichen, einem Betätigungsschieber (30), der mindestens teilweise im Gehäuse (10) zwischen den beiden Drehachsen (A1, A2) der Arretierungshaken (26, 28) angeordnet und so angebracht ist, dass er sich längs einer Verschiebungsrichtung (D) in einer Translation verschiebt, die im Wesentlichen senkrecht zu den Drehachsen (A1, A2) verläuft, wobei der Betätigungsschieber (30) mit den Arretierungshaken (26, 28) verbunden ist, so dass die Translationsbewegung des Betätigungsschiebers eine Schwenkbewegung der Arretierungshaken zur Folge hat, **dadurch gekennzeichnet, dass**

jeder der Arretierungshaken (26, 28) an einem Paar entsprechender Ritzel (40, 42) angebracht ist, die drehbar innerhalb der Gehäuses (10) angebracht sind und dieselben Drehachsen (A1, A2) wie die Arretierungshaken aufweisen, und der Betätigungsschieber (30) mindestens zwei lateral gegenüberliegende Zahnstangenabschnitte (32, 34) aufweist, die jeweils mit dem Paar der entsprechenden Ritzeln (40, 42) in Eingriff stehen.

2. Verriegelungsanordnung nach Anspruch 1 **dadurch gekennzeichnet, dass** das Gehäuse (10) eine obere Schale (12) und eine untere Schale (14) aufweist und das Paar der Arretierungshaken an einer oberen Wand (16) der oberen Schale (12) angeordnet ist und am Paar der entsprechenden Ritzel über ein Paar entsprechender Verbindungsstifte (44, 46) angebracht ist, die die obere Wand durchqueren.
3. Verriegelungsanordnung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die jeweiligen feststehenden Arretierungselemente (22, 24) mindestens teilweise die Form eines Zylinders aufweisen, der eine Längsachse (A3, A4) aufweist, die mindestens annähernd mit den Drehachsen (A1, A2) der Arretierungshaken zusammenfällt, wenn sich der Flügelrahmen in einer geschlossenen Position befindet.

4. Verriegelungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Längsachse (A3, A4) der feststehenden Arretierungselemente und die Drehachsen (A1, A2) der Arretierungshaken geringfügig nicht fluchen, wobei der Fluchtungsfehler annähernd 1 mm beträgt. 5
5. Verriegelungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Arretierungshaken eine Wand aufweisen, die einen vorderen Wandabschnitt (100) und einem hinteren Wandabschnitt (110) aufweist, die einen Winkel bilden, wobei der vordere Wandabschnitt und der hintere Wandabschnitt jeweils eine im Wesentlichen ebene Innenfläche (130, 140) präsentieren, die parallel zu den Drehachsen der Arretierungshaken angeordnet ist, wobei ein Abstand zwischen der Innenfläche (130) des vorderen Wandabschnitts (100) und den Drehachsen kleiner als ein Abstand zwischen der Innenfläche (140) des hinteren Wandabschnitts (110) und den Drehachsen ist. 10 15 20
6. Verriegelungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sich die Innenfläche des vorderen Wandabschnitts (100) der Arretierungshaken mit einer abgeschrägten Endfläche (150) des vorderen Wandabschnitts vereinigt. 25
7. Verriegelungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** jeder der Arretierungshaken (26, 28), der an dem Paar der entsprechenden Ritzel (40, 42) angebracht ist, von den entsprechenden Ritzeln entfernbar ist, ohne dass das Gehäuse (10) geöffnet werden oder in die obere (12) und untere Schale (14) demontiert werden muss. 30 35
8. Verriegelungsanordnung nach Anspruch 7, **dadurch gekennzeichnet, dass** jeder der Arretierungshaken (26, 28) durch Kraft vom entsprechenden Ritzel entfernbar ist. 40
9. Verriegelungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Betätigungsschieber (30) eine vordere Öffnung (19) des Gehäuses (10) durchquert und einen vorderen Abschnitt (33) aufweist, der außerhalb des Gehäuses angeordnet ist und an eine Antriebsstange (5) angelenkt ist. 45 50
10. Verriegelungsanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die untere Schale (14) des Gehäuses einen Führungsschlitz (18) aufweist, in dem der Betätigungsschieber (30) verschiebbar angeordnet ist. 55
11. Verriegelungsanordnung nach einem der vorherge-

henden Ansprüche, **dadurch gekennzeichnet, dass** der Betätigungsschieber eine längliche Öffnung (50) aufweist, die durch einen abgeschrägten Zylinder (52) durchquert wird.

Revendications

1. Ensemble de verrouillage utilisé sur des fenêtres de ventilation de toit ou des portes comprenant un dispositif de verrouillage possédant :

un boîtier (10) conçu pour être monté sur un châssis qui est agencé pour s'incliner de façon pivotante à l'intérieur d'un cadre principal de la fenêtre ou de la porte,

une gâche (20) conçue pour être montée sur le cadre principal de la fenêtre pour être située en face du boîtier (10) lorsque le châssis est dans une position fermée, possédant une paire d'éléments de fermeture stationnaires (22, 24),

une paire de crochets de fermeture (26, 28) montés sur le boîtier (10) et agencés pour pivoter autour de deux axes de rotation respectifs (A1, A2) sensiblement parallèles l'un à l'autre, chaque crochet de fermeture (26, 28) étant capable de pivoter entre une position de verrouillage dans laquelle chaque crochet de fermeture (26, 28) est en prise de verrouillage avec des éléments de fermeture stationnaires respectifs (22, 24) pour verrouiller le châssis dans la position fermée et une position de non-verrouillage dans laquelle chaque crochet de fermeture est hors de prise avec les éléments de fermeture stationnaires respectifs pour permettre l'ouverture de la fenêtre ou de la porte,

un coulisseau d'actionnement (30) agencé au moins partiellement dans le boîtier (10) entre les deux axes de rotation (A1, A2) des crochets de fermeture (26, 28) et montés pour coulisser en translation le long d'une direction de coulissement (D) sensiblement perpendiculaire aux axes de rotation (A1, A2), le coulisseau d'actionnement (30) étant lié aux crochets de fermeture (26, 28) de sorte que le mouvement de translation du coulisseau d'actionnement implique un mouvement de pivotement des crochets de fermeture,

caractérisé en ce que

chacun des crochets de fermeture (26, 28) est monté sur une paire de pignons correspondants (40, 42) qui est montée de façon rotative à l'intérieur du boîtier (10) et possède le même axe de rotation (A1, A2) que le crochet de fermeture, et

le coulisseau d'actionnement (30) comprend au moins deux portions de crémaillère latéralement opposées (32, 34) qui entrent en prise respec-

- tivement avec la paire de pignons correspondants (40, 42).
2. Ensemble de verrouillage selon la revendication 1, **caractérisé en ce que** le boîtier (10) comprend une enveloppe supérieure (12) et une enveloppe inférieure (14) et la paire de crochets de fermeture est située sur une paroi supérieure (16) de l'enveloppe supérieure (12) et est montée sur la paire de pignons correspondants par l'intermédiaire d'une paire de goupilles de raccordement correspondantes (44, 46) qui traversent la paroi supérieure. 5
 3. Ensemble de verrouillage selon les revendications 1 ou 2, **caractérisé en ce que** les éléments de fermeture stationnaires respectifs (22, 24) comprennent au moins partiellement la forme d'un cylindre possédant un axe longitudinal (A3, A4) qui coïncide au moins approximativement avec les axes de rotation (A1, A2) des crochets de fermeture lorsque le châssis est dans une position fermée. 10
 4. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les axes longitudinaux (A3, A4) des éléments de fermeture stationnaires et les axes de rotation (A1, A2) des crochets de fermeture sont légèrement désalignés, le désalignement étant approximativement d'1 mm. 15
 5. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les crochets de fermeture comprennent une paroi possédant une portion de paroi avant (100) et une portion de paroi arrière (110) formant un angle, la portion de paroi avant et la portion de paroi arrière chacune présentant une surface intérieure sensiblement plate (130, 140) agencée parallèlement aux axes de rotation des crochets de fermeture, une distance entre la surface intérieure (130) de la portion de paroi avant (100) et l'axe de rotation étant inférieure à une distance entre la surface intérieure (140) de la portion de paroi arrière (110) et l'axe de rotation. 20
 6. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la surface intérieure de la portion de paroi avant (100) du crochet de fermeture rejoint une surface d'extrémité inclinée (150) de la portion de paroi avant. 25
 7. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chacun des crochets de fermeture (26, 28) monté sur la paire de pignons correspondants (40, 42) est amovible à partir des pignons correspondants sans devoir ouvrir ou démonter le boîtier (10) dans les enveloppes supérieure (12) et inférieure (14). 30
 8. Ensemble de verrouillage selon la revendication 7, **caractérisé en ce que** chacun des crochets de fermeture (26, 28) est amovible par force à partir des pignons correspondants. 35
 9. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le coulisseau d'actionnement (30) traverse une ouverture avant (19) du boîtier (10) et inclut une portion avant (33) positionnée à l'extérieur du boîtier et articulée sur une tige d'entraînement (5). 40
 10. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'enveloppe inférieure (14) du boîtier inclut une fente de guidage (18) dans laquelle le coulisseau d'actionnement (30) est agencé pour coulisser. 45
 11. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le coulisseau d'actionnement possède une ouverture oblongue (50) qui est traversée par un cylindre incliné (52). 50

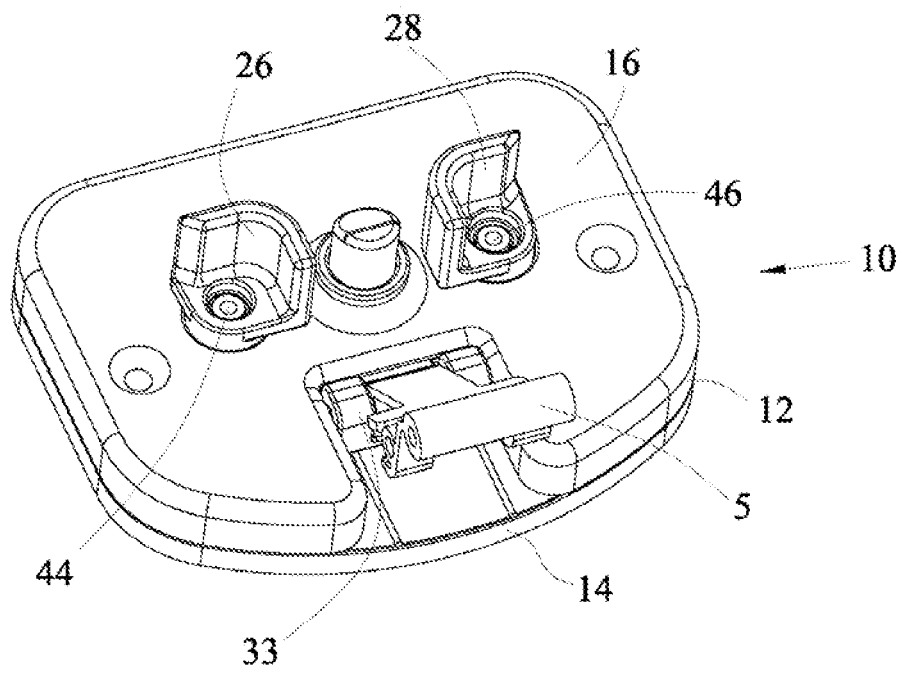


FIG. 1

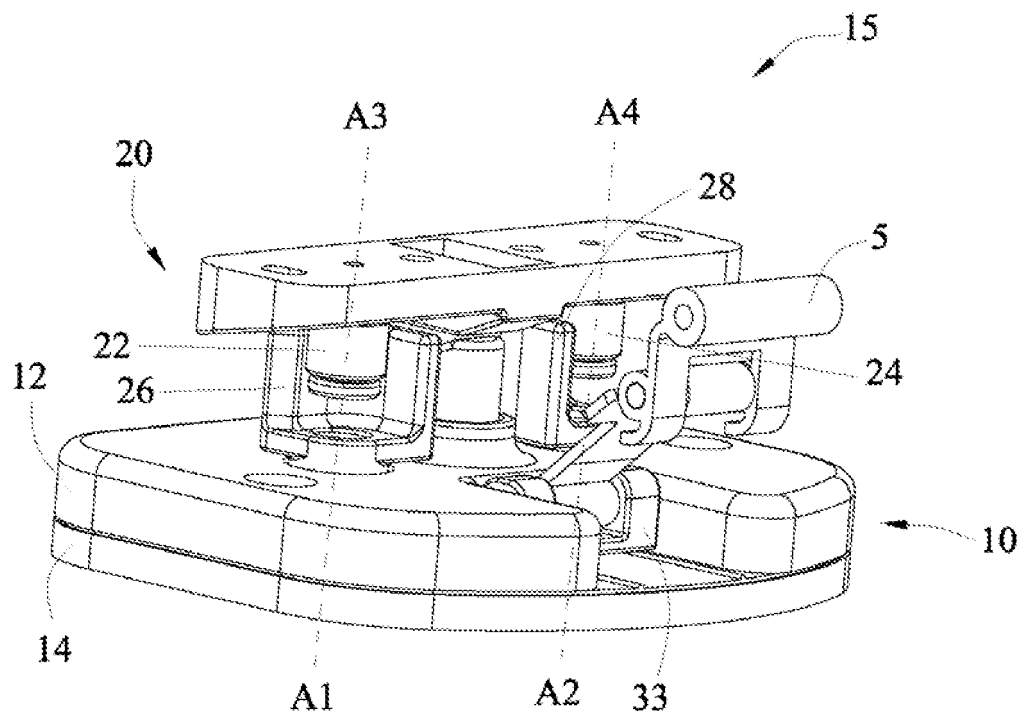


FIG. 2

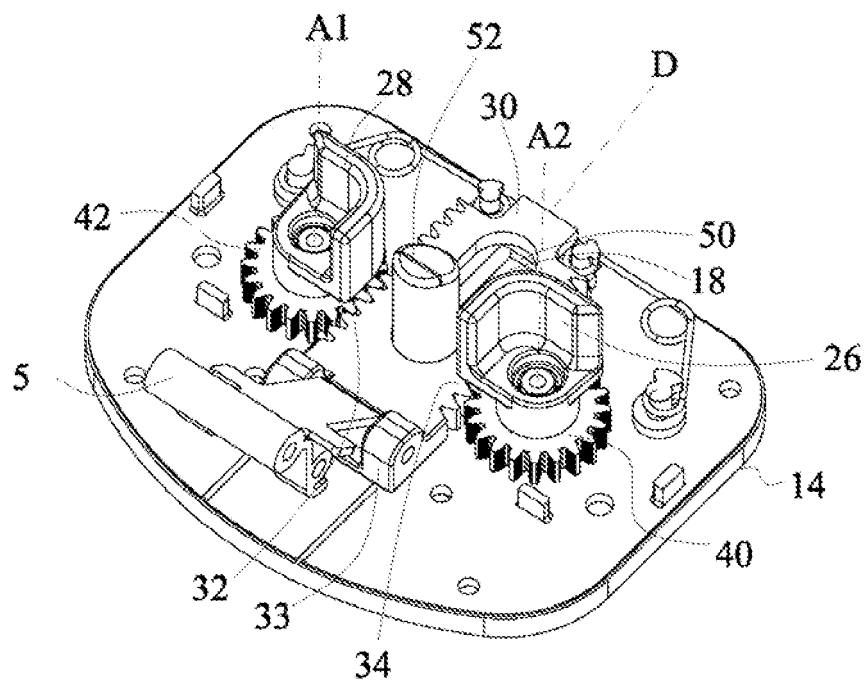


FIG. 3

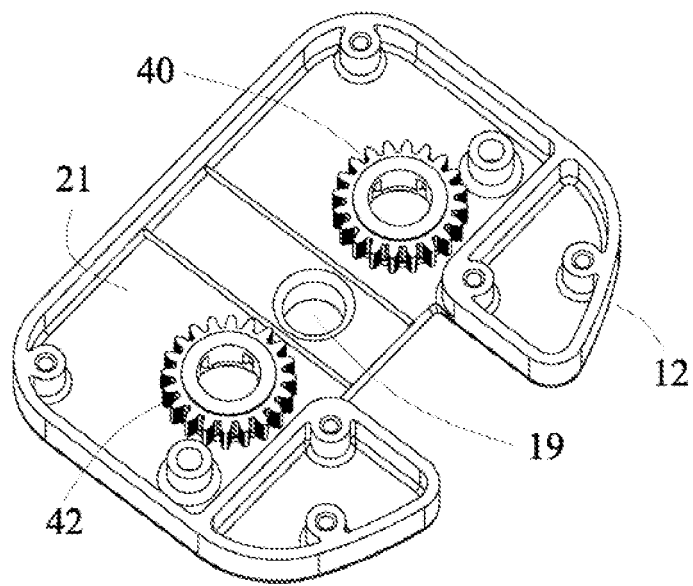


FIG. 4

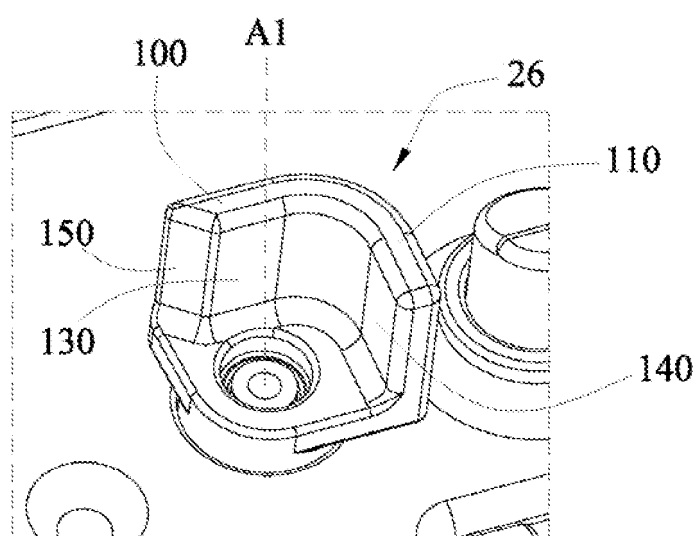


FIG. 5

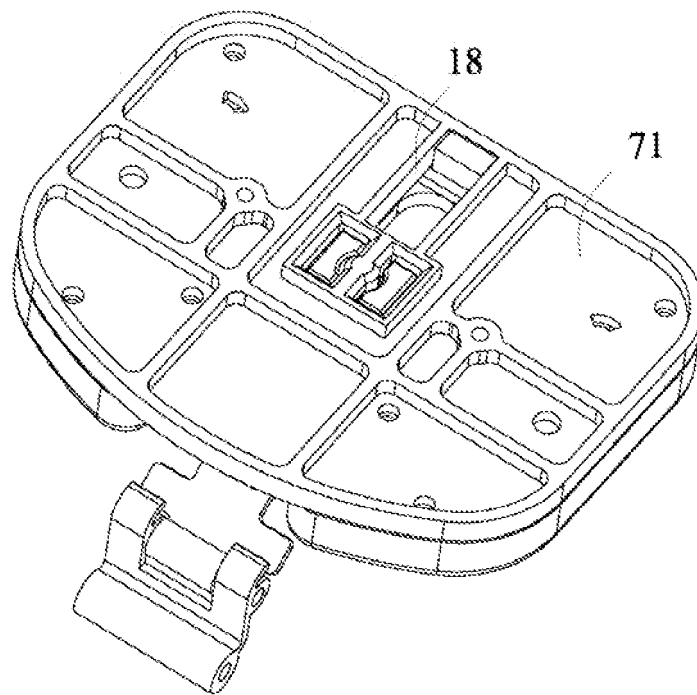


FIG. 6

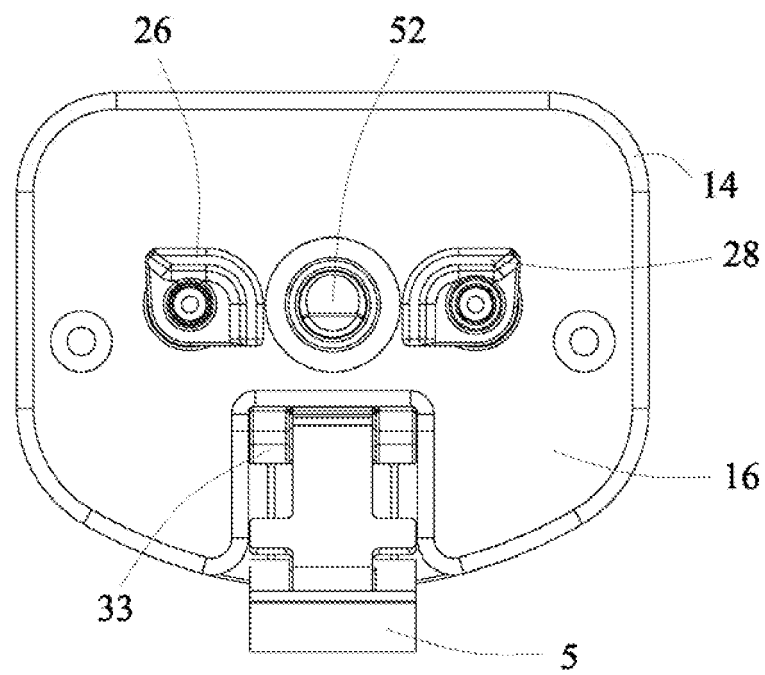


FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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