



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
25.07.2018 Bulletin 2018/30

(51) Int Cl.:
E05C 17/24^(2006.01)

(21) Application number: **16778073.3**

(86) International application number:
PCT/ES2016/070644

(22) Date of filing: **14.09.2016**

(87) International publication number:
WO 2017/046434 (23.03.2017 Gazette 2017/12)

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **16.09.2015 ES 201531317**

(71) Applicant: **Sistemas Técnicos Del Accesorio Y
Componentes, S.L**
15900 Padrón (A Coruña) (ES)

(72) Inventors:
• **FERNÁNDEZ COBIÁN, Javier**
15900 Padrón (A Coruña) (ES)
• **FERNÁNDEZ PADRÓN, Juan Carlos**
15900 Padrón (A Coruña) (ES)

(74) Representative: **Pons Ariño, Angel**
Pons Patentes y Marcas Internacional, S.L.
Glorieta Rubén Dario 4
28010 Madrid (ES)

(54) **DOOR RESTRICTOR**

(57) The invention relates to a door restrictor that can be installed quickly and conveniently by means of a step of pre-mounting and a step of mounting. The door restrictor comprises a device for attaching to a frame, a joining plate, and a device (1) for sliding attachment comprising a slide (9) with: a hole (15) for receiving a second joining element (5) linked to the joining plate (2), and a flange (25) around or partly inside the hole (15). The second

joining element (5) comprises a peripheral groove (16) intended to receive the flange (25), for pre-mounting. The restrictor also comprises at least one locking lever (7) or locking plate (8) which, in the locking position, is in direct contact with the second joining element (5) or with the flange (25) of the slide (9), locking the position of the second joining element (5), securing the mounting.

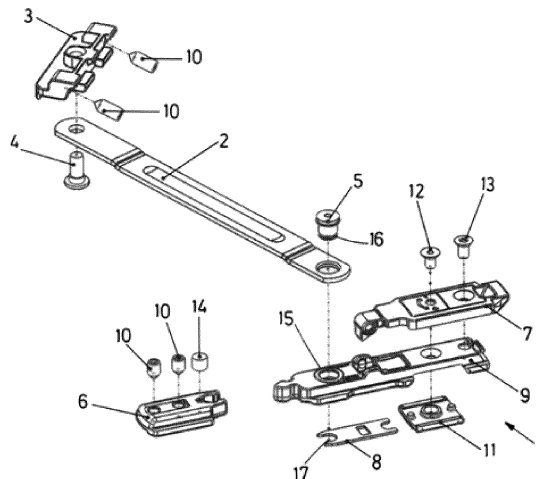


FIG.1

Description

OBJECT OF THE INVENTION

[0001] The present invention falls within the technical field of window and/or door fittings. More specifically, it describes an opening limiter which comprises a novel mounting and removal system and also integrates the systems for braking and for retention in the limit position.

BACKGROUND OF THE INVENTION

[0002] The general function of an opening limiter for windows and/or doors is to limit the relative movement between the frame and the leaf of a window or door, in order to leave the same open to a certain maximum point. This is especially interesting when it is desired to integrate a window or door into an environment where opening it is only possible to a certain angle due to, for example different obstacles which may be present and which prevent it opening to the maximum. That is to say, the opening limiters allow a maximum opening angle to be fixed.

[0003] Additionally, the opening limiters can comprise brake systems, systems for retention in the limit position or safety systems for the windows or doors on which they are installed. Due to these advantages and the trend and diversification of the current market, there are increasingly more clients who request the installation of an opening limiter on their windows or doors.

[0004] Up to now, opening limiters have generally been composed of three clearly differentiated parts, which are a fixation to the frame, a fixation to the leaf and a mounting plate with rivet to join both fixations.

[0005] The fixation to the frame consists of a fixation to the channel of the frame of the window or door. This fixation positions the location of the opening limiter and consequently determines the limit opening of the window or door. This fixation is usually anchored by means of set screws which allow its repositioning along the channel. This element marks the maximum opening which the leaf can have for a determined position of the opening limiter on the channel. The fixation to the leaf of the window or door is slid by way of the channel of the leaf, thereby allowing a relative movement between the leaf and the frame of the window.

[0006] Therefore, the functioning of the opening limiter consists of the fixation of one of the parts of the same to the channel of the frame and the joining by means of a plate and a sliding part to the leaf in order to thereby allow a maximum opening of the window or door. The opening limiter can be positioned both on the upper part and the lower part of the leaf. Depending on its position with respect to the axis of rotation of the window, it will allow greater or lesser opening, that is to say, if the same opening limiter is positioned close to the axis of rotation, it will allow greater opening than if it is positioned further from said point.

[0007] Opening limiters are also known from the state

of the art that are specifically intended to be installed on windows or doors with heavy leaves with large dimensions. These types of windows or doors, due to the large size, have a high inertia during the movement and closure. Therefore, it is convenient to use an opening limiter which brakes its movement over its course. The implementation of this function is usually done by means of a brake device. In general, this function consists of the manipulation of the fixation to the leaf so that one of the parts of said fixation to the leaf touches against the channel of the leaf, thus preventing its free movement.

[0008] Additionally, the opening limiters of the state of the art can comprise a system for locking the window for a certain opening, causing the window to remain open and fixed at this opening angle without it closing again. In this way, a safety point is provided in certain environments such as areas with windows within the reach of children or public buildings (hospitals, schools, etc.) where it is of interest to have this capacity for locking the opening in order to allow ventilation without posing a risk to any of the occupants of the building. In order to incorporate this function, the anchoring of the fixation to the leaf, which allows the joining thereof to a fixed stop in a determined position in the channel of the leaf, is usually modified.

[0009] The most significant technical problems associated with the use of these opening limiters particularly affect the mounting operations of said opening limiters. They are generally complex mountings and the mechanisms for implementing them are usually difficult to operate or complex to understand.

[0010] Also in addition to this, a gap in the market has been observed since opening limiters comprising all the functions previously described in one single device are not known.

[0011] The document FR2370845 is for example known in which a device is described for the pivoting connection of a removable arm with a slide control. In said document, the functioning of an opening limiter is described with the locking and unlocking functions contained in the device itself. It consists of an opening limiter with two rods in the sliding fixation which facilitate the clipping of the mounting plate and therefore its own locking once mounted. The two rods are placed on the sliding fixation and clasp the rivet of the mounting plate preventing it from being removed. One technical problem associated with this opening limiter is that in order to implement the unlocking, a tool in the form of a key has to be used which facilitates the separation of two rods. The tool has to be introduced between the rods and forces these to separate. In this way, the plate is released, allowing the separation and removal of the opening limiter. Therefore the manner of implementing the mounting and clipping of the opening limiter is cumbersome and not very efficient.

[0012] Another known opening limiter is described in the French utility model FR2988762 and consists of an opening limiter which is fixed by means of an anchoring

device in the form of a horseshoe. In this case, by means of using a tool in the form of a key, the feet are separated from the anchoring, releasing the joining bolt and allowing the removal of the opening limiter. Therefore, like in the previous case, the use of a tool is required and it is also necessary to reach the exact location where the tool has to be used in an environment that is difficult to access. This is therefore an opening limiter which is not useful or practical in terms of carrying out quick removal.

DESCRIPTION OF THE INVENTION

[0013] The opening limiter which is described comprises a locking and unlocking system which allows simpler and more intuitive mounting and removal of the opening limiter than the opening limiters known from the state of the art. In this case, in order to anchor or release the opening limiter on a window or door, it is only necessary to move a lever.

[0014] The opening limiter also comprises a safety system for ensuring that it is maintained in the position in which it has been locked, that is to say, in the position in which it has been installed. The opening limiter also comprises a brake system and a system for retention in a limit position.

[0015] The opening limiter generally comprises three clearly differentiated parts:

- a device for fixation to the frame, configured for being anchored to the channel of the frame of the window or door which determines the position of the opening limiter,
- a device for sliding fixation to the leaf, configured for being slid along the channel of the window or door,
- a mounting plate, configured for joining the two fixation devices and which determines the maximum opening angle of the window or door.

[0016] As has been previously described, these elements are already known from the opening limiters of the state of the art. Additionally, the opening limiter of the present invention comprises a locking and unlocking system which allows its intuitive mounting and removal and this is one of its main advantages. The opening limiter can be used and installed by any end user without specific knowledge of carpentry.

[0017] Most of the time this opening limiter is used as a solution to protect the leaves of a window or door from interior obstacles or to prevent complete opening of the same. However, it is also necessary for the user to be able to access the window or door in order to carry out cleaning work or for possible passage through the same. In these cases, having the capacity to easily mount and remove the opening limiter is essential.

[0018] The sliding fixation device comprises at least one slider which is the element via which it is displaced along the channel of the leaf of the window or door. At the same time, it comprises at least one locking lever

which is the element which has to move in order to lock or unlock the opening limiter, that is to say, in order to mount or remove the opening limiter.

[0019] At the same time, the opening limiter of the present invention comprises an integrated safety system which has been designed to prevent the unlocking of the opening limiter when it has already been mounted. The safety system guarantees that the opening limiter can only be removed when the user intentionally unlocks it.

[0020] Another characteristic of the present invention is that it comprises a brake system which allows the users to open the windows or doors in a stable and progressive manner, irrespective of the weight of the leaf of the window or door. To this end, the opening limiter comprises a brake, arranged on the slider, opposed to the channel of the window or door. The brake moves the slider to the channel, causing friction between the two. The friction generated allows the displaceable fixation device to reach the end stroke of the window or door more slowly and with less energy than in the movement limitation systems installed on the conventional opening limiters. Therefore, the impact of the leaf upon closure is minor and the hinges and the rest of the fittings do not suffer damage.

[0021] At the same time, the opening limiter incorporates a system for retention in a limit position. To this end, it comprises a stop which is fixedly installed in the channel of the leaf of the window or frame. Said stop is configured so that the sliding fixation device remains joined when it reaches the maximum position. One of the parts of the device for sliding fixation to the leaf comprises an end with a configuration that is complementary to the end of the stop. This allows the sliding fixation device to remain entrained in the stop. The stop is preferably anchored by means of screwing and is placed in the desired position by the user which corresponds to the desired opening angle of the leaf of the window or door.

[0022] The opening limiter can also comprise a damping system configured to dampen the impact caused by the kinetic energy which the window or door may produce during its movement. To this end, the opening limiter comprises a circular elastic piece arranged in the stop which allows the sliding fixation device to brake without impacts when it reaches its end stroke in the channel of the leaf.

[0023] In order to mount the opening limiter on a window or door, the first step to carry out is the integral joining of the device for fixation to the frame. Said device is in turn connected to the mounting plate which can rotate via a first joining element with respect to the device for fixation to the frame.

[0024] The following step to be carried out is to position the device for sliding fixation to the leaf and carry out pre-mounting between said device and a second joining element which is part of the mounting plate. To this end, the slider of the sliding fixation device comprises at least a number of projections in the manner of a tabs or (insert the expression that we use to describe it in the second

embodiment) which are intended to be housed in a perimeter groove of the second joining element. This facilitates the subsequent locking of the device for sliding fixation to the leaf because it is already correctly positioned and pre-mounted.

[0025] A mounting step is then carried out which consists of locking the joining between the sliding fixation device and the mounting plate. To this end, a locking lever is used which secures the joining carried out in the pre-mounting between the slider and the second joining element.

[0026] At the same time, after having carried out the locking by means of the locking lever, a safety screw can be used which prevents the unintentional unlocking of the opening limiter. This safety screw is preferably a torx pin safety screw which can only be manipulated with a determined key. Therefore, a third person who does not have said key cannot unlock the opening limiter. This safety screw fixes the locking lever to the slider thus preventing the release and removal of the opening limiter.

[0027] In a second embodiment of the opening limiter, the pre-mounting is also carried out by introducing the second joining element into the hole of the slider. In this embodiment, the perimeter groove of the second joining element can have a greater thickness and depth than in the first embodiment because the sliding fixation device only comprises the locking lever (in this case there is no locking plate which acts together with the locking lever). At the same time in this second embodiment, the slider itself comprises mounting protrusions which start from the hole and which, when joined together, allow the position of the second joining element in the hole to be retained. The locking lever comprises protrusions configured for being joined to the slider and for being joined to the mentioned mounting protrusions.

[0028] At the same time, a third embodiment is envisaged in which the opening limiter comprises a unidirectional brake for controlling the displacement velocity of the sliding fixation device during the closing or opening movement. The unidirectional brake is preferably arranged such that it controls the opening velocity of the window, door or similar.

DESCRIPTION OF THE DRAWINGS

[0029] In order to complement the description being made and with the object of helping to better understand the characteristics of the invention, in accordance with a preferred practical embodiment thereof, said description is accompanied, as an integral part thereof, by a set of drawings where, in an illustrative and non-limiting manner, the following has been represented:

Figure 1 shows a perspective and exploded upper view of the opening limiter with all its elements.
Figure 2 shows a perspective and exploded lower view of the opening limiter with all its elements.
Figure 3 shows a perspective upper view of the open-

ing limiter with its main elements.

Figure 4 shows a perspective lower view of the opening limiter with its main elements.

Figure 5 shows a perspective upper view in which the locking lever is in a position inclined with respect to the slider.

Figure 6 shows a perspective close-up lower view of the locking lever in an open position as in Figure 5. Figure 7a shows a sectioned view of the elements of the sliding fixation device with the locking lever in a fully inclined position with respect to the slider in a pre-mounting position as shown in Figure 6.

Figure 7b shows a sectioned view of the elements of the sliding fixation device of Figure 7a with the locking lever inclined with respect to the slider but with a smaller inclination.

Figure 7c shows a sectioned view of the elements of the sliding fixation device of Figure 7a with the locking lever in parallel to the slider completely parallel to the locking lever.

Figure 8 shows an exploded perspective upper view of the anchoring device in a second embodiment.

Figure 9 shows a sectioned view of the joining between the second joining element and the slider in a second embodiment.

Figure 10 shows a perspective lower view of a first step of placing the lever in the slider in the second embodiment.

Figure 11 shows a perspective lower view which shows a second step of placing the lever in the slider in the second embodiment.

Figure 12 shows a perspective exploded upper view of the anchoring device in a third embodiment.

Figure 13 shows a sectioned view of the slider of the third embodiment with the unidirectional brake in a position in which it does not contact the channel of the window and allows the free movement of the window.

Figure 14 shows a sectioned view of the slider of the third embodiment with the unidirectional brake in a position in which it contacts the channel of the window, braking the movement of the window.

Figure 15 shows a perspective upper view in which the joining between the unidirectional brake and the slider in the third embodiment is seen.

PREFERRED EMBODIMENT OF THE INVENTION

[0030] The opening limiter of the present invention is especially designed for facilitating mounting and removal thereof on a window or door. In addition, the opening limiter comprises a safety system for preventing its unintentional removal, a brake system for preventing large or heavy windows or doors from closing with an impact, and a system for retention in a limit position which allows the window or door to be maintained open at a determined angle.

[0031] The opening limiter comprises at least one de-

vice for fixation to the frame (3) configured for being fixedly joined to the channel of the frame of the window or door, a device for sliding fixation to the leaf (1) configured for being joined to the channel of the leaf of the window or door in a sliding manner and a mounting plate (2) which is joined to both devices, connecting them. As has been previously described, these elements are present in all the opening limiters.

[0032] The joining between the device for fixation to the frame (3) and the frame of the window is preferably carried out by means of screwing (10). The joinings between the mounting plate (2) and the devices are carried out by means of a first joining element (4) and a second joining element (5) which allow the relative rotation between the elements which they join (that is to say, between the mounting plate (2) and the device for fixation to the frame (3) and between the mounting plate (2) and the device for sliding fixation to the leaf (1) respectively).

[0033] In a preferred embodiment, the device for fixation to the frame (3) is made of metal and is joined to the channel of the frame by means of set screws (1). The mounting plate (2) is also preferably made of metal and is joined to the device for fixation to the frame (3) by means of a first joining element (4) which allows the rotation of the mounting plate (2) with respect to the device for fixation to the frame (3). Said mounting plate (2) can have different measurements depending on the measurements of the window or door on which the opening limiter is going to be installed in order to allow for different configurations and opening angles.

[0034] The second joining element (5) is located at the other end of the mounting plate (2) and is integrally joined to said mounting plate. Said second joining element (5) is the element which allows the joining to the sliding fixation device (1) as is explained below.

[0035] The sliding fixation device (1) comprises at least one slider (9) which is the element which is displaced along the channel of the window or door and via which the other elements of the sliding fixation device (1) are mounted. The slider (9) comprises a hole (15) intended to receive the second joining element (5). At the same time, the slider (9) comprises at least one element configured for being connected to said second joining element (5), more specifically to a perimeter groove (16) of the second joining element (5) in order to carry out the pre-mounting of the opening limiter.

[0036] The sliding fixation device (1) also comprises a locking lever (7) which is intended to guarantee that the joining between the sliding fixation device (1) and the mounting plate (2) is stable and is maintained until the user wishes to intentionally separate them in order to remove the opening limiter. When the pre-mounting of the opening limiter has been carried out and the slider (9) is already connected to the second joining element (5), the locking lever (7) is actuated in order to fix said joining. When the user wishes to remove the opening limiter, they simply have to actuate the locking lever (7) in a reverse manner to the way in which they have pre-

viously in order to once again leave the opening limiter in the pre-mounting position. At this point, the user simply has to exert a light pressure in order to disconnect the slider (9) from the second joining element (5).

[0037] In another exemplary embodiment of the invention, the opening limiter can comprise a system for regulating the closing velocity of the window or door. To this end, the opening limiter comprises a brake (11) which is a piece located on the slider (9) and a brake screw (12) which can be a screw or a similar element.

[0038] The brake screw (12) is intended to pass the brake (11) and the slider (9) through a hole made in each one of these pieces. The brake screw (12) is actuated by rotating it in one direction in order to move the brake (11) to the channel of the leaf of the window or door and rotate it in the opposite direction in order to move the brake (11) away from said channel, modifying its position. When the brake screw (12) is rotated in the direction which causes the brake (11) to move to the channel, it causes the sliding fixation device (1) to increase its friction against the channel during its displacement. In this way, by facilitating a clamping effect between the brake (11) and the slider (9), a slower and more controlled movement of the sliding fixation device (1) is achieved, compensating for the weight and inertia of the window or door in the cases in which the window or door is large or very heavy.

[0039] In contrast, when the brake screw (12) is rotated in the opposing direction, the brake (11) is separated from the channel, the slider (9) also being separated, such that the sliding fixation device (1) is free, having minimum friction. This allows the window to move without any opposition.

[0040] At the same time, the object of the present invention is a system for retention in a limit position, that is to say, the possibility of stopping the opening limiter in a determined position. This retention is achieved by limiting the movement of the sliding fixation device (1) in a determined position.

[0041] To this end, the opening limiter also comprises a stop (6) which is a piece configured for determining the end stroke of the sliding fixation device (1). The ends of the stop (6) and of the sliding fixation device (1), which are opposed, have a complementary configuration in order to allow the temporary joining of the two (in order to maintain this end stroke position during the time which the user wishes to have the window or the door partially open). This is preferably a male-female joining and both ends are joined or released depending on the needs of the user. The joining of the stop (6) to the channel of the leaf of the window or door is preferably carried out by means of set screws (10).

[0042] The stop (6) comprises a housing arranged at the end intended to contact the sliding fixation device (1) in which a rubber circular stop (14) is located. Said rubber circular stop (14) dampens the impact of the sliding fixation device (1) (more specifically of the slider (9)) when it arrives at its end stroke upon entering into contact with

the stop (6). In this way, the window reaches the end of the path more smoothly.

[0043] The materials of the sliding fixation device (1) are preferably plastic in order to facilitate the movement of the slider (9) through the channel of the leaf with the exception of the brake screws (12) and fixation screws (13) and screws of the locking plate (8) which are made of metal in order to facilitate their resistance to possible forces. This is important because the locking plate (8) is the piece which supports the retaining force of the second joining element (5) and which prevents the separation between said second joining element (5) and the sliding fixation device (1).

[0044] In a first exemplary embodiment of the invention, the sliding fixation device (1) comprises a locking lever (7) connected to a locking plate (8). The combination of these two elements allows the joining between the sliding fixation device (1) and the mounting plate (2) to be fixed.

[0045] As has been previously described, the slider (9) comprises a hole (15) intended to house the second joining element (5) which in turn is joined to the mounting plate (2). In this first exemplary embodiment, a tab (25) is located on the upper surface of the slider (9), corresponding at least partially to the hole (15), said tab extends towards the hole (15) and is intended to remain housed in a perimeter groove (16) of the second joining element (5). In this way, owing to the tab (25), the second joining element (5) is maintained in its position in the interior of the hole (15) of the slider (9), preventing the movement of the same in a perpendicular direction to the direction of its movement. This corresponds to the pre-mounting of the opening limiter previously described.

[0046] In this first exemplary embodiment, the sliding fixation device (1) comprises a locking lever (7) which can pivot with respect to the slider (9) around pivot axis (20) which is perpendicular to the sliding direction. Said locking lever (7) is connected to a locking plate (8) which also forms part of the slider (9).

[0047] The locking plate (8) is a plate which is displaced longitudinally in the interior of the slider (9). Said locking plate (8) has a circular indentation (17) in at least one of its ends which is intended to be housed in the perimeter groove (16) of the second joining element (5) in order to lock the opening limiter. At the same time, the locking plate comprises a drill hole (19) which is intended to receive an inclined extension (18) of the locking lever (7). When the locking lever (7) pivots, the inclined extension (18) is also displaced, moving with it the locking plate (9) which is pulled by the inclined extension (18) which contacts the locking plate (8) on the walls of the drill hole (19). The locking plate (8) has a thickness according to the thickness of the perimeter groove (16) of the second joining element (5) in order to be able to remain housed in the same.

[0048] The pre-mounting of the sliding fixation device (1) is carried out with the locking lever (7) in a position inclined with respect to the slider (9). In this position, the

locking plate (8) is separated from the second joining element (5). When the pre-mounting has already been carried out (the tab (25) of the slider (9) is already housed in the perimeter groove (16) of the first joining element)), the locking lever (7) is pivoted until it is positioned parallel to the slider (9). In this position, the inclined extension (18) is fully passed through into the drill hole (19) and during the pivoting of the locking lever (7) and the corresponding movement of the inclined extension (18), the displacement of the locking plate (8) has been effected. Therefore, in this position which is the rest position of the sliding fixation device (1), the rounded indentation (17) of the locking plate (8) is introduced into the perimeter groove (16) of the second joining element (5).

[0049] The locking lever (7) comprises, at one of its ends, an inclined extension (18) which is configured to pass through a drill hole (19) of the locking plate (8) when the locking lever (7) is arranged parallel to the slider (9) (which is the rest position). The pre-mounting operation is carried out by maintaining the locking lever (7) in a position inclined with respect to the slider (9) such that, when the locking lever (7) pivots, the inclined extension (18) pivots and displaces the locking plate (8), moving it away from the second locking element (5).

[0050] In Figures 7a, 7b and 7c, the progression of the movement of the locking plate (8) pulled by the inclined extension (18) of the locking lever (7) can be observed. In Figure 7a, the locking lever (7) has been illustrated in its maximum inclination position with respect to the slider (9), in the pre-mounting position. In Figure 7b, the same elements of the opening limiter have been illustrated but with the locking lever (7) when part of the pivoting movement for locking the sliding fixation device (1) has been carried out. As can be seen in this image, the inclined extension (18) pulls with it the locking plate (8), moving it towards the second joining element (8). Lastly, in Figure 7c, the same previous elements have been illustrated but in the rest position, that is to say, with the locking lever (7) fully supported on the slider (9). In this image, it can be seen how at the end of the movement of the locking lever (7) the inclined extension has been fully introduced through the drill hole (19), pulling the locking lever (8) with it until the rounded indentation (17) has been introduced into the perimeter groove (16) of the second joining element (5). This position ensures the joining between the sliding fixation device (1) and the mounting plate (2).

[0051] When it is desired to unlock the opening limiter in order to remove it from its position on the window or door, the locking lever (7) simply has to be pivoted so that the inclined extension (18) pivots, displacing with it the locking plate (8), moving away from the second joining element (5). When the rounded indentation (17) is separated from the second joining element (5), it remains joined to the sliding fixation device (1) only by means of the tab (25) which is still in the perimeter groove (16). The user simply has to apply a light force in order for the tab (25) to exit the perimeter groove (16) and thus remove

the opening limiter.

[0052] Additionally, the opening limiter can comprise a safety system for ensuring that the locking lever (7) is maintained in its position until the user wishes to remove the opening limiter.

[0053] To this end, in one exemplary embodiment, the opening limiter comprises a fixation screw (13) which is preferably a screw with flat threading for example a Torx® safety screw or another type of screw with similar characteristics. This fixation screw (13) joins the locking lever (7) to the slider (9) preventing the pivoting movement of the lever (7) when it is in the rest position (the opening limiter is mounted). In this way, it is impossible to activate the locking/unlocking mechanism of the opening limiter. When it is a safety screw, it is very difficult to manipulate it and an action can only be carried out on said screw if the elements required for this action are available.

[0054] In a second exemplary embodiment which is shown in Figures 8 to 11, the configuration itself and the design of the slider (9) mean that the second joining element (5) is clipped by means of force and owing to the shape of the same when it is introduced into the hole (15) of the slider (9). In this way, the second joining element (5) remains pre-mounted on the slider (9) and cannot exit the hole (15). Subsequently, in order to complete the locking of the end position, it has to be ensured that the second joining element (5) does not exit the slider (9) at any time.

[0055] In this second exemplary embodiment, the tab (25) of the slider (9) is arranged around the hole (15) and remains housed in the perimeter groove (16) of the second joining element (5) in a pre-mounting position. In this case, the perimeter groove (16) is wider and deeper than in the first exemplary embodiment.

[0056] When the second joining element (5) is introduced into the hole (15) of the slider (9), the user who is carrying out the mounting has to exert a pressure in order to make the second joining element (5) pass through the hole (15) which has a smaller diameter. In the pre-mounting position, the tab (25), which is located on the perimeter of the hole (15), is housed in the perimeter groove (16) in order to prevent the second joining element (5) separating from the slider (9). In order to be able to remove it from the hole (15), it would be necessary to exert a pressure in the opposite direction to the pressure which has been exerted in order to introduce it into the hole (15). In Figure 9, a section of the joining area between the mounting plate (2) with the second joining element (5) and with the slider (9) can be seen in the second embodiment.

[0057] At least one circular cross section (28) of the hole (15) is preferably open to facilitate the deformation of the hole (15) which allows the second joining element (5), which has a larger diameter than the hole (15), to be introduced.

[0058] Another characteristic of the slider (9) of the second embodiment is that it comprises a housing (27)

which is intended to receive the locking lever (7). In this case, the locking lever (7) does not have a folding movement like in the first embodiment, but rather it is joined to or released from the slider by means of introducing protrusions (22, 23) of the locking lever (7) into indentations of the slider (9).

[0059] At the same time, the slider (9) comprises mounting protrusions (21) which preferably extend from the hole (15) to the housing (27) and are the elements which allow the second joining element (5) to be retained in its position when the opening limiter is fully mounted. These mounting protrusions (21) are preferably at the sides of the open circular cross section (28) of the hole (15) and when the locking lever (7) is positioned in its final position in the housing (27), said locking lever (7) moves the mounting protrusions (21) towards each other in order to maintain the perimeter of the hole (15) closed around the second joining element (5).

[0060] Additionally, indentations (29, 30) are found in the housing (27) of the slider (9) intended to receive the protrusions (22, 23) of the locking lever (7). By means of these indentations and protrusions, the position of the locking lever (7) is fixed on the slider (9) and the mounting of the opening limiter is completed. The protrusions (22) are also configured to fix the position of the second joining element (5) in the hole (15) of the slider (9).

[0061] In a preferred exemplary embodiment, two first indentations (29) are found in the housing (27) of the slider (9) intended to receive the two first protrusions (22) of the locking lever (7). Said first protrusions (22) are configured to remain in contact with the mounting protrusions (21) of the slider (9) ensuring the joining of the mounting plate (2) to the slider (9). At the same time, the housing (27) comprises second indentations (30) which are intended to receive second protrusions (23) which are introduced by clipping into the second indentations (30).

[0062] When the opening limiter is pre-mounted, in order to complete the mounting, the locking lever (7) is introduced into the housing (27) in a direction perpendicular to the slider (9), introducing the first protrusions (22) into the first indentations (29) and the second protrusions (23) into the second indentations (30). The indentations (29, 30) have a greater length than the protrusions (22, 23) in order to allow the displacement of the locking lever (7) via the slider (9) even with the protrusions (22, 23) arranged in the indentations (29, 30) until the protrusions (22) hook onto the mounting protrusions (21). The position of the second joining element (5) is secured in the hole (15) at this time and therefore the opening limiter is fully mounted.

[0063] What stands out the most in the locking and unlocking systems proposed in the first and second embodiment is that they are very easy to use with respect to other systems since by means of the simple movement of the locking lever (7), the mounting and removal of the opening limiter is quickly achieved.

[0064] A third embodiment of the invention is also en-

visaged, shown in Figures 12 to 15, in which the opening limiter comprises a unidirectional brake (24). This piece allows the frictional movement, which is produced to compensate the weight of the leaves of large or heavy windows and doors, to be produced in only one direction.

[0065] The unidirectional brake (24) is designed with a configuration in the form of a wedge such that it has a greater height at one of its ends than at the other. In this way, when it is moved in the direction from the end which has the greater height to the end which has a smaller height, friction is produced against the channel of the leaf, causing a wedge effect and controlling the velocity of the displacement. In the other direction of the movement, the unidirectional brake (24) does not interact with the channel of the window and therefore allows the free movement of the slidable fixation device (1) through the channel of the window. The unidirectional brake (24) can be regulated by means of its manipulation for example by means of a screw in order to control its separation between both to be controlled and therefore the velocity with which the window or door is closed or opened.

[0066] In Figure 12, a perspective exploded view of the opening limiter in the third embodiment is shown. The pre-mounting is carried out in the same manner as in the first embodiment. In this second embodiment, like in the first embodiment, the second joining element (5) comprises a perimeter groove (16) intended to receive a tab (25) of the slider (9). The pre-mounting of the mounting plate (2) and the device for sliding fixation to the leaf (1) is carried out by introducing the second joining element (5) into the hole (15) of the slider (9) such that the tab (25) is housed in the perimeter groove (16) preventing the second joining element (5) from exiting the hole (15).

[0067] At the same time, in this embodiment, like in the first embodiment, the sliding fixation device (1) comprises a locking plate (8) with a circular indentation (17) intended to be housed in the perimeter groove (16) of the second joining element (5) in order to secure the mounting of the opening limiter.

[0068] In this third embodiment, the opening limiter does not comprise the locking lever (7), but rather the locking plate (8) is displaced by actuating it directly. That is to say, when the user wishes to move the locking plate (8) in order to go from pre-mounting to mounting, they simply have to actuate said locking plate by pulling or pushing it.

[0069] The unidirectional brake (24) is arranged on the slider (9) and its position with respect to the channel of the leaf is regulated by means of a brake screw (12) like in the first embodiment. The difference between both embodiments in this case is that the unidirectional brake (24) has a variable height which allows the leaf to be braked only during one of the movements of the window or door (opening or closing as desired).

[0070] In this case, the slider (9) comprises a brake housing (31) which also has a variable height. This brake housing (31) is intended to receive the unidirectional

brake (24) in its interior and preferably has the same inclination as the unidirectional brake.

[0071] In Figures 13 and 14, the unidirectional brake (24) is shown in two limit positions. The position shown in Figure 13 corresponds to the position in which the unidirectional brake (24) is located when the window is being closed (in another embodiment, this could be the reverse, that is to say, when the window is being opened depending on the needs or wishes of the user). In this case, the slider (9) of the slidable fixation device (1) is moved towards the right (according to the illustration of said figure), consequently the unidirectional brake (24) is arranged on the more spacious part of the slider. That is to say, in this case, the unidirectional brake (24) is arranged in the area of the brake housing (31) which has the greater depth. As can be seen in Figure 13, the unidirectional brake (24) is in a floating state and allows the free movement of the slider (9).

[0072] In Figure 14, the unidirectional brake (24) has been illustrated in the position in which it remains when the window is being opened (or closed according to how the slider (9) is arranged). In this case, the slider (9) of the slidable fixation device (1) is moved towards the left (according to the illustration of said figure), consequently the unidirectional brake (24) is arranged in the less spacious part of the slider. That is to say, in this case, the unidirectional brake (24) is arranged in the area of the brake housing (31) which has the smaller depth. As can be seen in Figure 14, the unidirectional brake (24) protrudes through the lower part of the slider (9), entering into contact with the channel of the leaf and providing a resistance to the movement.

[0073] The joining of the unidirectional brake (24) to the slider (9) can be seen in Figure 15. The brake housing (31) comprises a clip hole (32) which is a through hole intended to receive clipping tabs (33) of the unidirectional brake itself (24). The clip hole (33) has a greater length than that of the clipping tabs (33) in order to allow the displacement of said clipping tabs when the unidirectional brake (24) is displaced along the brake housing (31).

Claims

1. An opening limiter of the type which determines the maximum degree of opening of a window, door or similar and which comprises:

- a sliding fixation device (1) intended to be installed in the channel of the leaf of the window or door with the possibility of being displaced in said channel,
- a device for fixation to the frame (3) intended to be installed on the frame of the window or door in a fixed position,
- a mounting plate (2) connected to the device for fixation to the frame (3) by means of a first joining means (4) and to the sliding fixation de-

vice (1) by means of a second joining means (5),
characterized in that

- the sliding fixation device (1) comprises a slider (9) configured to be displaced along the channel of the leaf and which comprises:

- a hole (15) intended to receive the second joining element (5), and
- at least one tab (25) arranged around the hole (15) or partially in the interior of said hole (15),

- the second joining element (5) is integrally joined to the mounting plate (2) at one of its ends and at the other end, which is arranged in the hole (15) of the slider (9), it comprises a perimeter groove (15) intended to receive the tab (25) of the slider (9) in order to carry out the pre-mounting of the opening limiter,

- the sliding fixation device (1) comprises at least one locking lever (7) or a locking plate (8) which can move between an unlocking position in which it allows the free movement of the second joining element (5) and a locking position (8) in which it is in direct contact with the second joining element (5) or with the tab (25) of the slider (9), locking the position of the second joining element (5).

2. The opening limiter according to claim 1, **characterized in that** it also comprises a stop (6) in the channel of the leaf with joining means to said channel of the leaf in order to fix its position.
3. The opening limiter according to claim 2, **characterized in that** the sliding fixation device (1) and the stop (6) have a complementary configuration configured to allow the joining thereof.
4. The opening limiter according to claim 1, **characterized in that** the sliding fixation device (1) comprises a locking plate (8) which can displace in the longitudinal direction of the sliding fixation device (1) and comprises a circular indentation (17) intended to be housed in the perimeter groove (16) of the second joining element (5).
5. The opening limiter according to claim 1, **characterized in that** the sliding fixation device (1) comprises a locking lever (7) joined in a pivoting manner to the slider (9) and comprises a locking plate (8) which can displace in the longitudinal direction of the sliding fixation device (1) and the locking plate (8) comprises a drill hole (19) intended for the introduction of part of the locking lever (7).
6. The opening limiter according to claim 5, **characterized in that** the locking lever (7) rotates around a

pivot axis (20) and comprises an inclined extension (18) which is at least partially housed in the drill hole (19) such that when the locking lever (7) pivots, the inclined extension (18) pulls with it the locking plate (8).

7. The opening limiter according to claim 1, **characterized in that** the sliding fixation device (1) comprises a fixation screw (13) which joins at least the locking lever (7) or the locking plate (8) to the slider (9), locking its relative movement.
8. The opening limiter according to claim 1, **characterized in that** the sliding fixation device (1) also comprises a brake (11) which is arranged between the slider (9) and the channel of the leaf in which it is displaced at a regulatable distance from said channel and is joined to the slider (9).
9. The opening limiter according to claim 1, **characterized in that** the slider (9) comprises at least one housing (27) intended to receive the locking lever (7) and the hole (15) comprises at least one open circular cross section (28) from which mounting protrusions (21) extend and which are arranged at least partially so as to coincide with the housing (27).
10. The opening limiter according to claim 9, **characterized in that** the housing (27) comprises at least first indentations (29) and second indentations (30) and the locking lever (7) comprises at least first protrusions (22) which are housed in the first indentations (29) and are configured to be hooked onto the mounting protrusions (21) of the slider and second protrusions (23) which are housed in the second indentations (30).
11. The opening limiter according to claim 10, **characterized in that** the first indentations (29) and the second indentations (30) have a greater length than the first protrusions (22) and the second protrusions (23) in order to allow the displacement of these protrusions in the interior thereof.
12. The opening limiter according to claim 1, **characterized in that** the sliding fixation device (1) comprises a unidirectional brake (24) joined to the slider (9) and **in that** it has a variable height.
13. The opening limiter according to claim 12, **characterized in that** the slider (9) comprises at least one brake housing (31) which has a variable height with the same inclination as the unidirectional brake (24) and **in that** it is intended to receive said unidirectional brake (24).

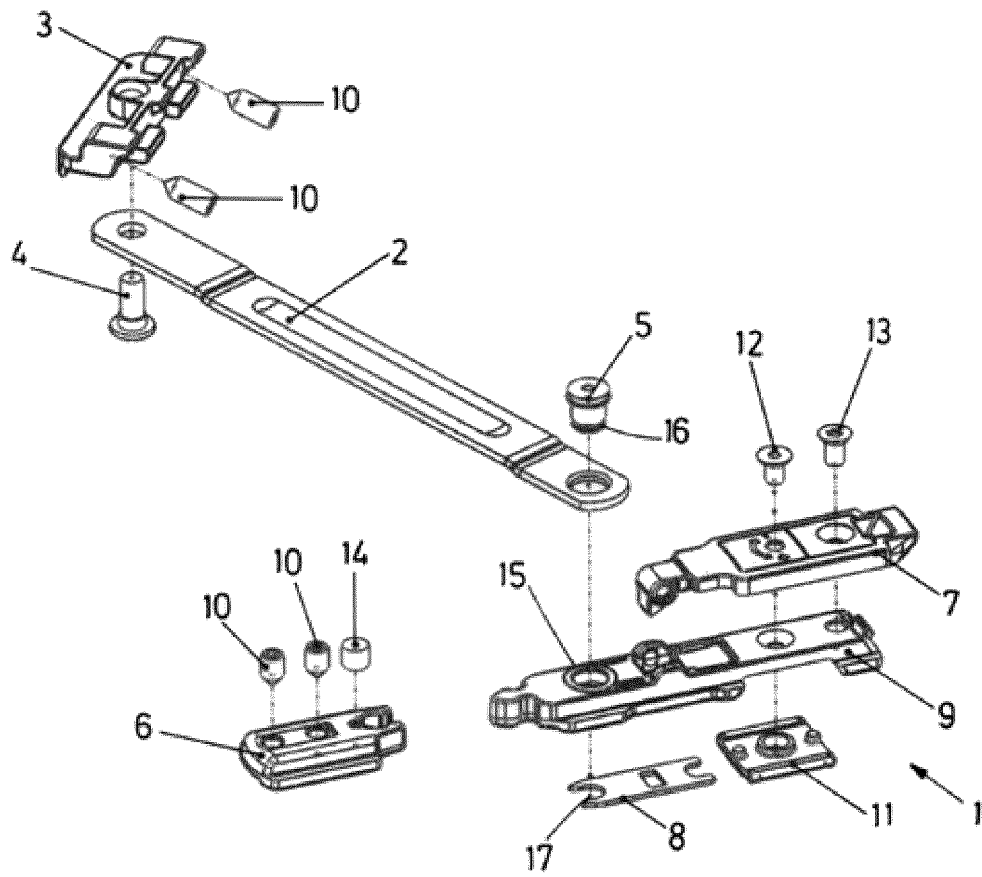


FIG.1

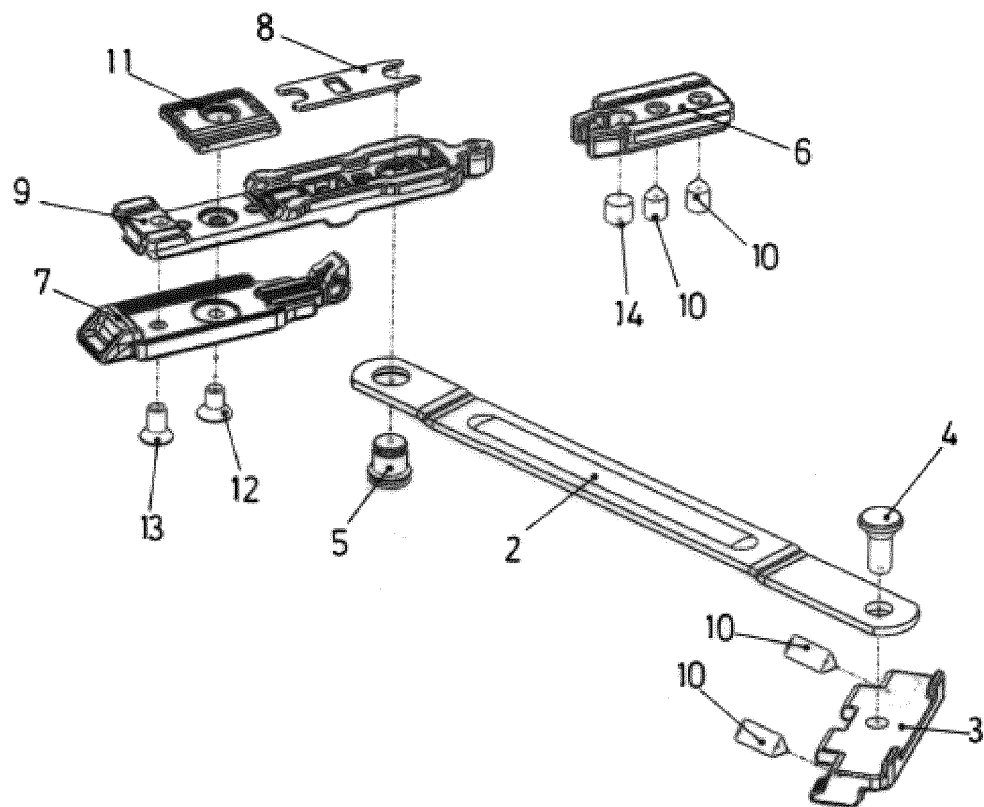


FIG.2

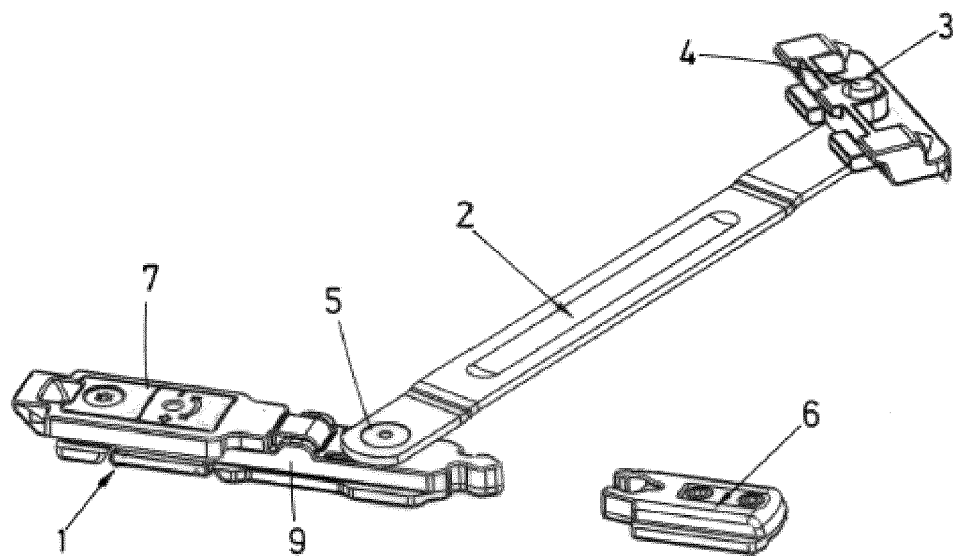


FIG.3

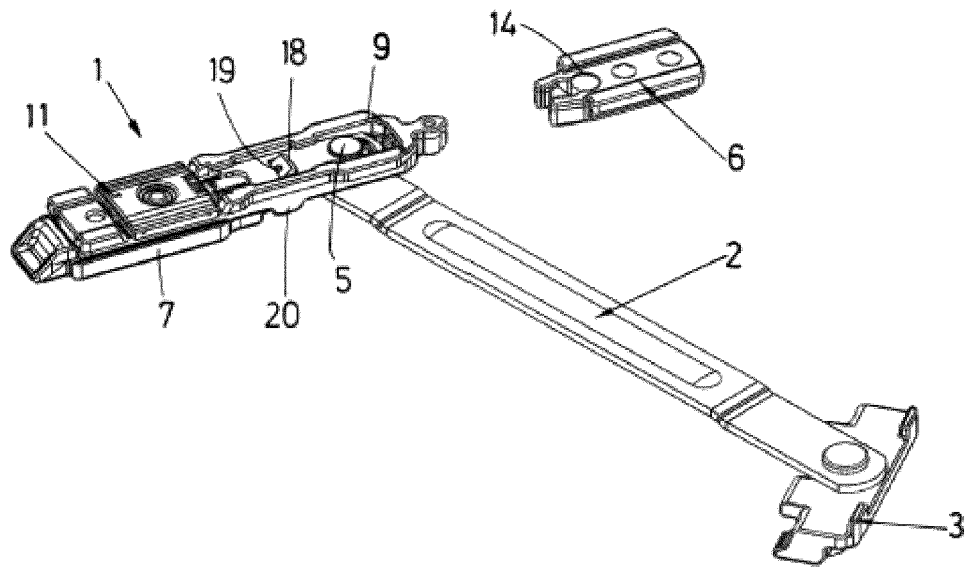


FIG.4

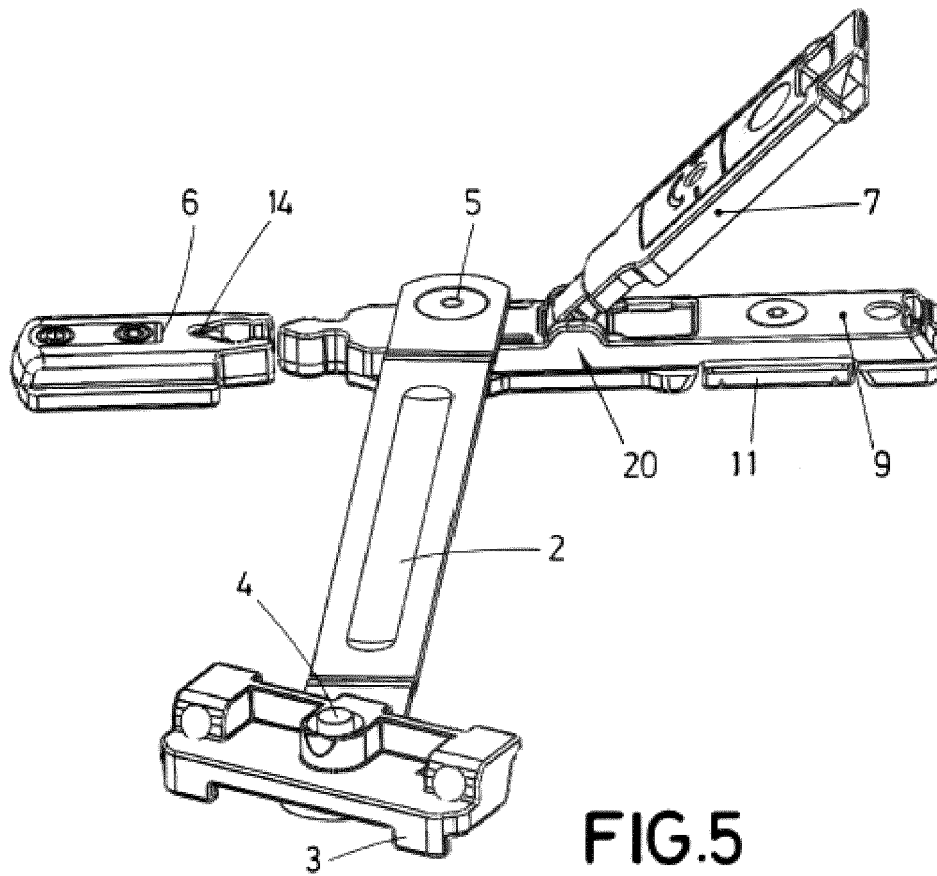


FIG.5

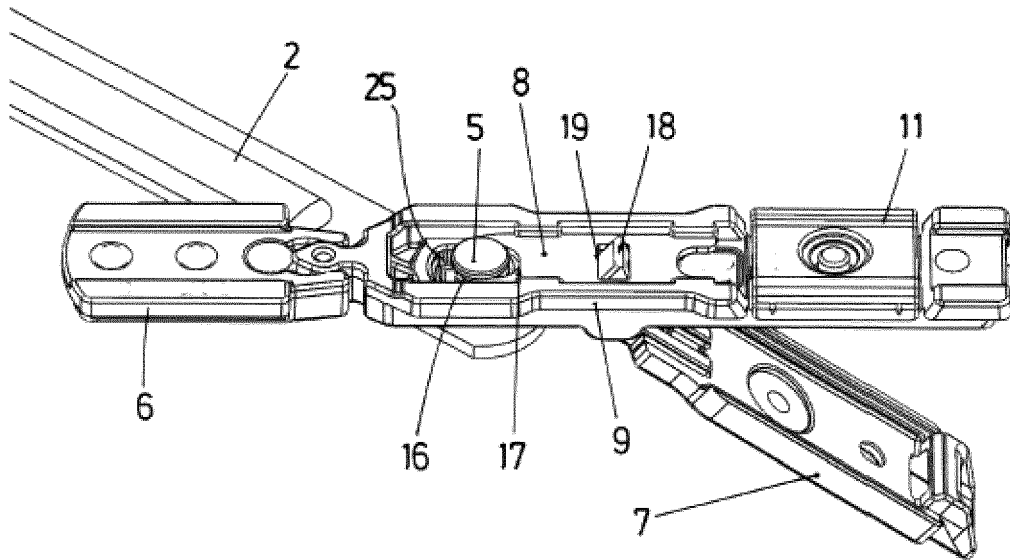


FIG. 6

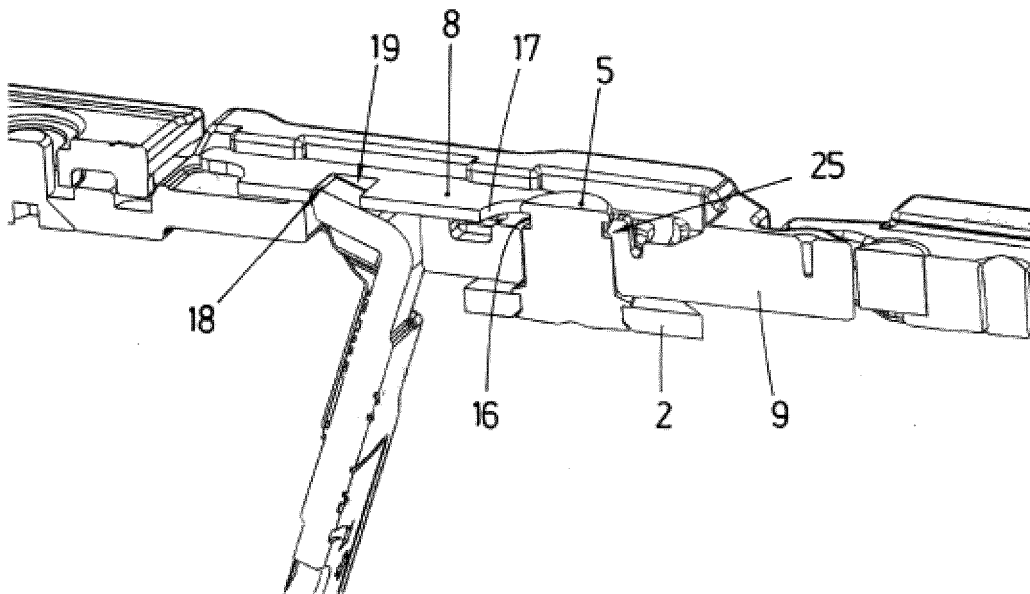


FIG. 7a

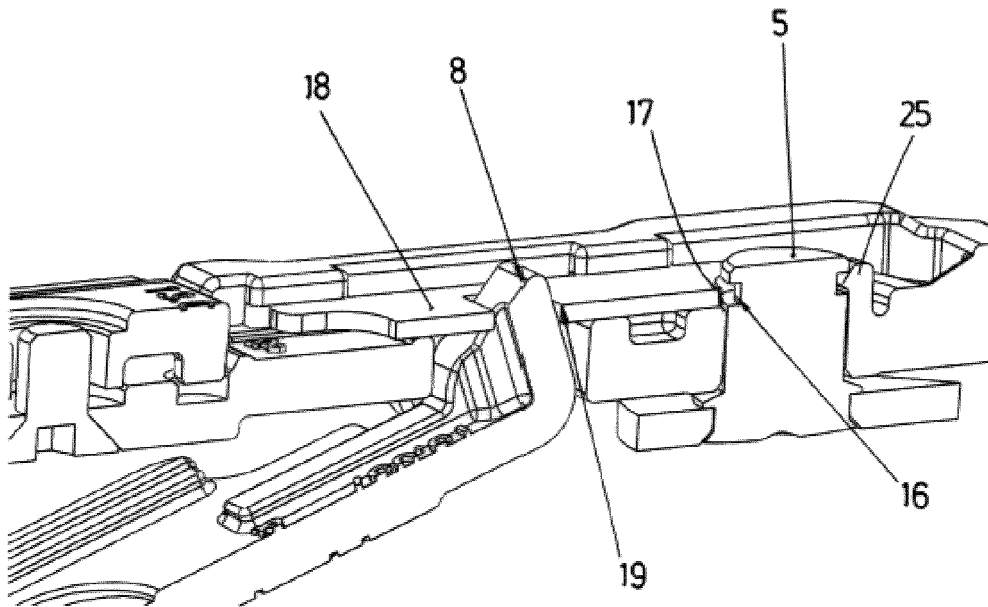


FIG. 7b

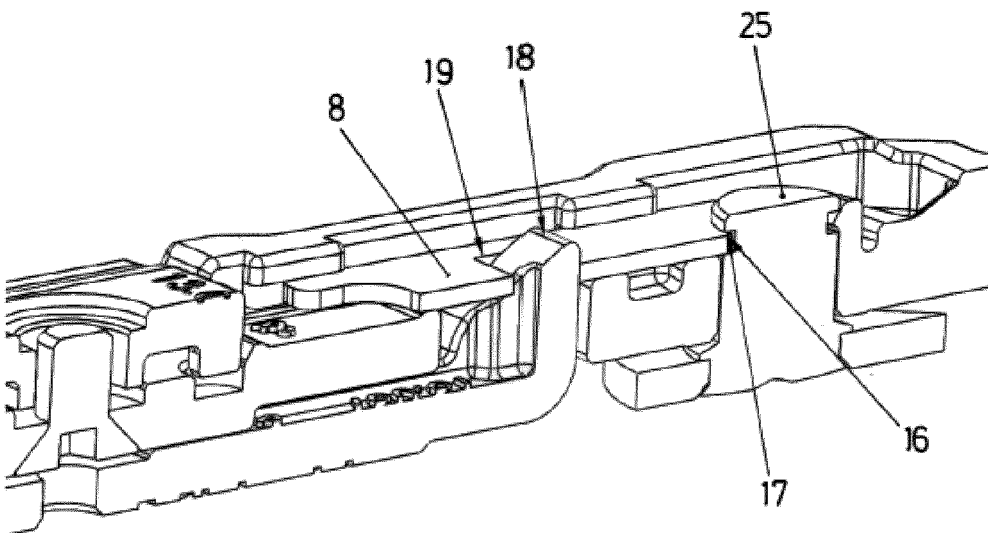


FIG. 7c

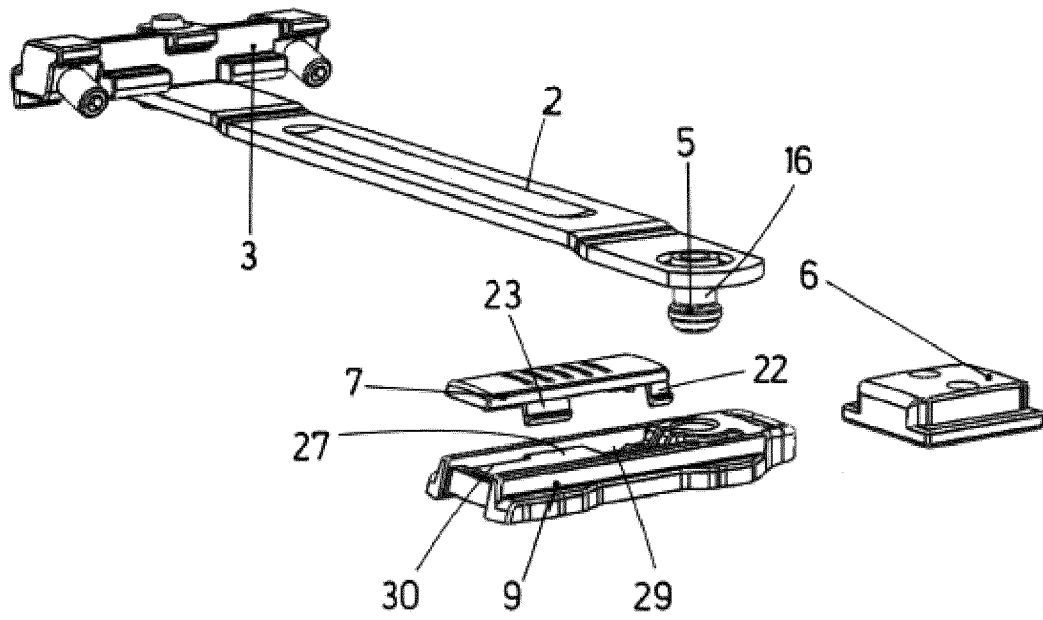


FIG.8

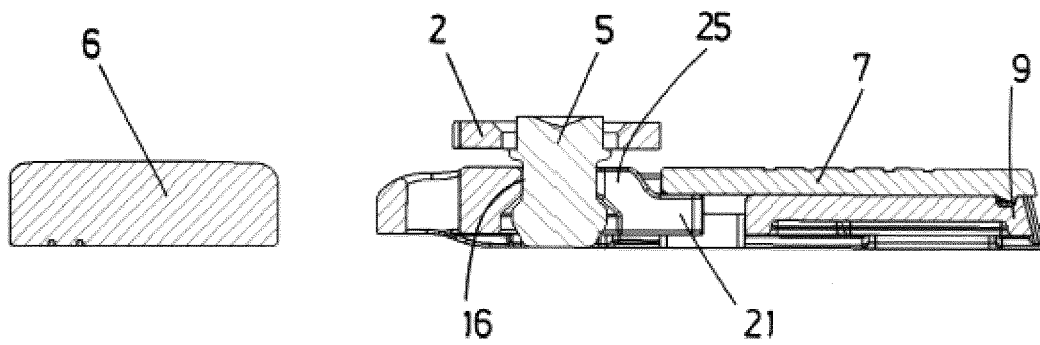


FIG.9

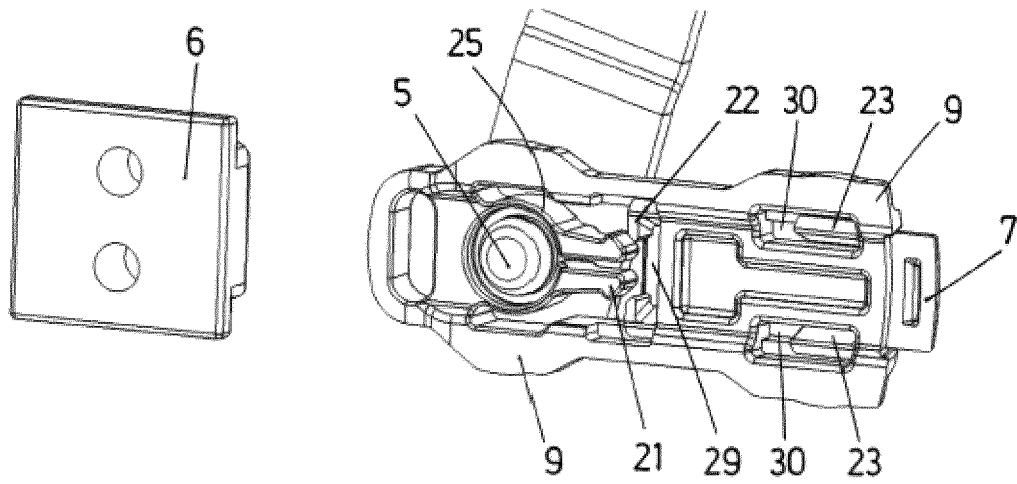


FIG.10

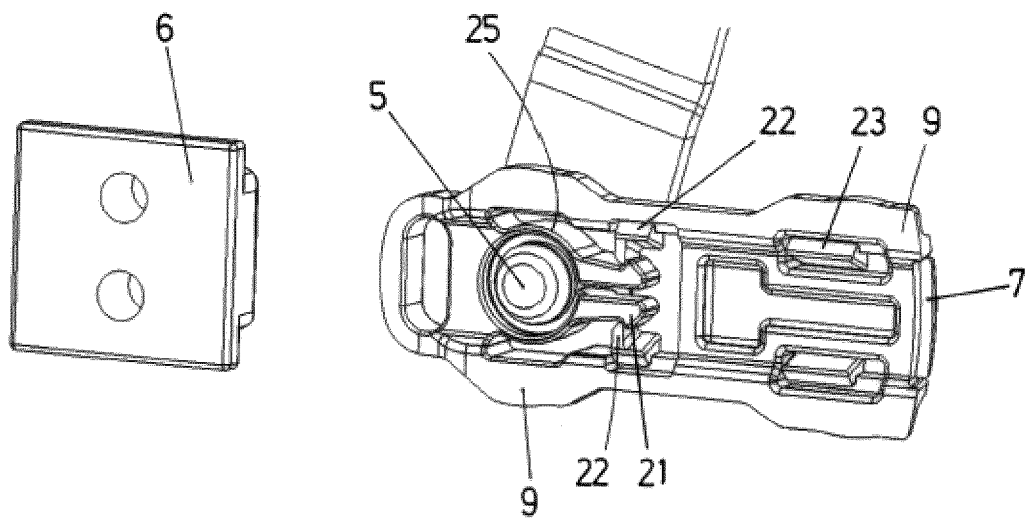


FIG.11

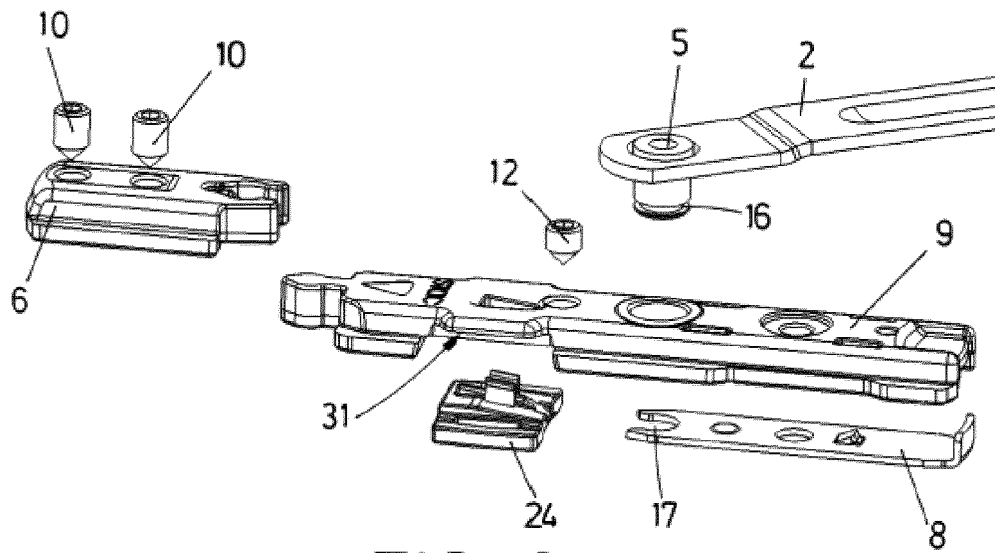


FIG.12

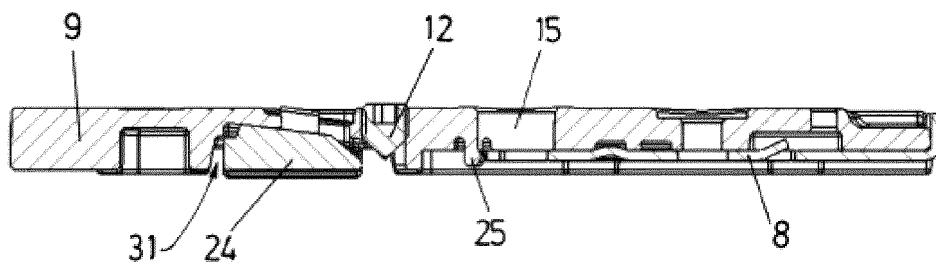


FIG.13

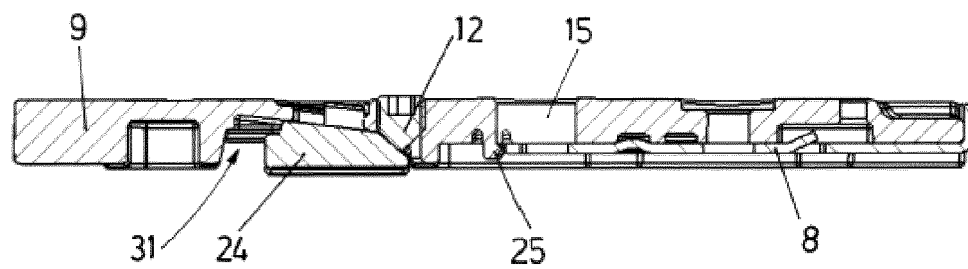


FIG.14

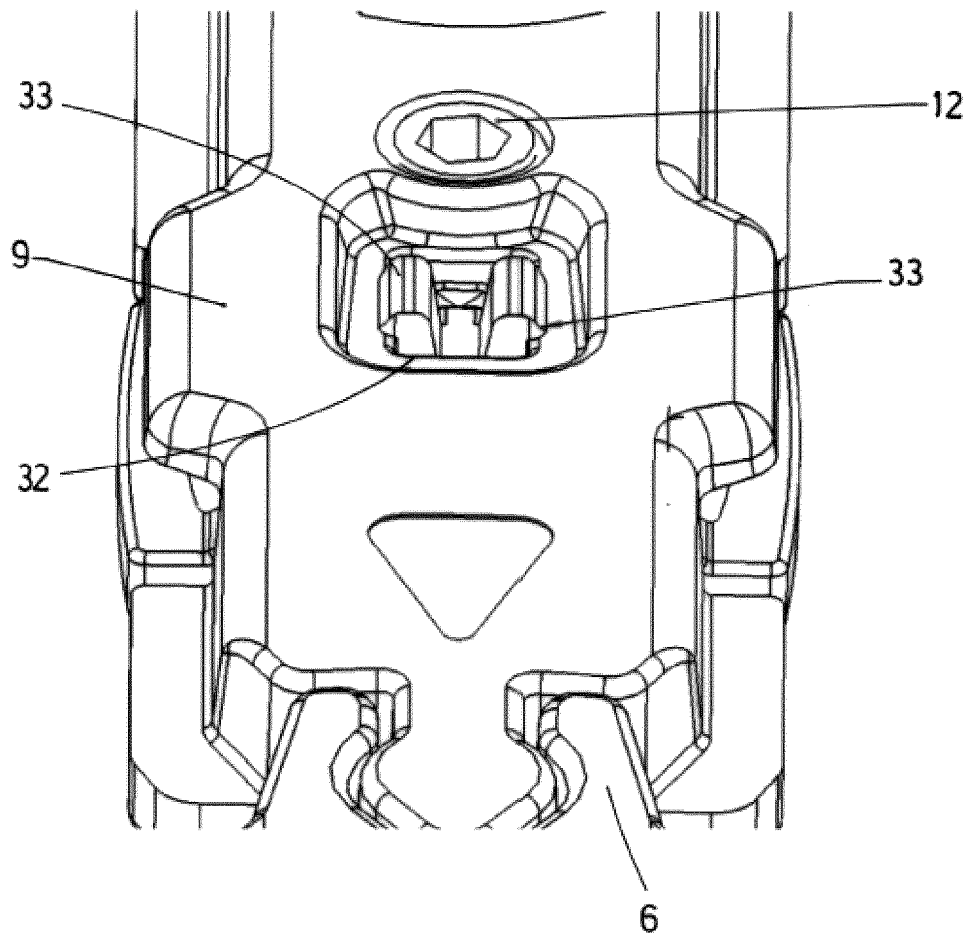


FIG.15

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2016/070644

A. CLASSIFICATION OF SUBJECT MATTER

INV. E05C17/24
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E05C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 997 989 A2 (HAUTAU GMBH) 3 December 2008 (2008-12-03) paragraph [0046]; figures -----	1
A	FR 2 370 845 A1 (SIEGENIA FRANK KG) 9 June 1978 (1978-06-09) cited in the application figures -----	1
A	DE 20 2005 015034 U1 (SIEGENIA AUBI KG) 19 January 2006 (2006-01-19) the whole document -----	1
A	DE 10 2005 000195 A1 (SIEGENIA AUBI KG) 28 June 2007 (2007-06-28) the whole document -----	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 November 2016

Date of mailing of the international search report

05/12/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Van Beurden, Jason

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/ES2016/070644

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1997989 A2	03-12-2008	AT 488659 T DE 102007021980 A1 EP 1997989 A2	15-12-2010 20-11-2008 03-12-2008
FR 2370845 A1	09-06-1978	AT 364617 B DE 7635460 U1 FR 2370845 A1	10-11-1981 24-02-1977 09-06-1978
DE 202005015034 U1	19-01-2006	AT 504711 T DE 202005015034 U1 EP 1926875 A1 WO 2007033842 A1	15-04-2011 19-01-2006 04-06-2008 29-03-2007
DE 102005000195 A1	28-06-2007	AT 439499 T DE 102005000195 A1 EP 1963604 A1 RU 2373360 C1 WO 2007073989 A1	15-08-2009 28-06-2007 03-09-2008 20-11-2009 05-07-2007

Form PCT/ISA/210 (patent family annex) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- FR 2370845 [0011]
- FR 2988762 [0012]