

The present invention relates to a sliding leaf according to the preamble of Claim 1, including a device for preventing derailing intended to prevent this leaf, which is mounted so that it can slide in a stationary supporting chassis, particularly for a door, window or the like, from being able, accidentally or even during a break-in operation, to leave or come out of rails which, at the top and/or bottom of this chassis, through the engagement in slots of profile sections belonging to the leaf, guide the latter in translation in this chassis.

It is known that, in the most conventional technique of producing such sliding leaves, for example according to US-A-3,304,658, it is necessary to provide inwardly projecting elements in the top and bottom sides of the rebate of the chassis which accommodates the leaf, these elements forming rails attached to or formed integrally in the manufacture of the chassis, and which extend parallel to profile sections framing the leaf and forming the corresponding sides thereof, these rails being designed to engage, by fitting into U-shaped grooves bounded by slots of different depths formed in the profile sections of the leaf. In particular, the height of these grooves is sufficient for it to be possible, firstly, to engage the rail provided at the top of the chassis in the corresponding groove, the depth of which is calculated so that the opposite side of the leaf can be brought vertically in line with the other rail located at the bottom of the chassis, the leaf then being lowered slightly so that the groove produced in its lower profile section engages the rail facing it over a height equal to the authorized displacement of the groove opposite with respect to the upper rail. Owing to the fact that this groove has a depth greater than that of the groove of the slot accommodating the lower rail, the leaf is immobilized relative to the chassis, without however preventing its displacement in lateral translation by sliding on the said rails, by virtue in particular of small wheels or rollers usually mounted in the bottom of these grooves.

It is, however, appreciated that via a reverse sequence of operations, the leaf can be removed from its chassis in other difficulty. In these conditions, in order to avoid undesired disengagement of the leaf, resulting in particular simply from lifting the latter up allowing one groove, then the other to escape from the corresponding rails, especially in the case of somebody attempting to break into the premises including the door or window equipped with such a sliding leaf, it is known to fit to the edges of the grooves provided in the upper and lower profile sections of the leaf, especially on the lateral sides thereof, attached components which limit the free depth of the corresponding groove, in particular at the top of the leaf, thereby preventing the latter from being lifted upwards, at least over a height such that the groove opposite can escape from its rail, in this case from the lower rail of the chassis.

The free clearance for upwards displacement of the leaf is hence reduced, this preventing any possibility of the profile sections at the top and bottom of the leaf from becoming derailed, relative to the rails of the chassis, without thereby limiting its ease of sliding along these rails.

To this end, provision has already been made for producing, in order to reduce the depth of the grooves of the slots of the leaf, stop components which are attached to the side thereof, in line with the ends of these grooves, these components being fixed to the leaf by a clip effect or by screwing, this assembly allowing these components to be concealed within the rebate of the chassis when the leaf is closed, thereby being inaccessible to an intruder.

The clip solution offers appreciable speed of installation of these components on windows or openings to which access is difficult or dangerous, for example on windows of very tall buildings; in contrast, it does not give excellent reliability of the assembly, particularly due to the fact of there being a risk of them easily coming off in the case of rubbing, or even during

manipulations involved in the cleaning of the leaves. Moreover, the use of such a clip solution precludes the installation of a stop component which would then be non-removable from the leaf, deliberate removal of these components having always to remain possible when the leaf is not in the closed position and the corresponding components concealed within the rebate of the chassis, in order to allow mechanical maintenance thereon, or on the leaf, or even replacement of these, requiring them to be dismantled.

The solution using screwing gives better behaviour of the components reducing the opening of the grooves, but requires a time for fitting which is sometimes long and tricky, especially when one bears in mind that a chassis ordinarily has two sliding leaves and therefore requires the fitting of four, or even eight components of the abovementioned sort. In addition, for large leaves, particularly tall leaves, with a height greater than 2 m, it is not always convenient to screw stop components at the top of these leaves.

The present invention aims for a sliding leaf equipped with a device of the sort mentioned hereinabove, in particular such as defined in the preamble of the main claim appended, utilizing a clip solution, therefore affording ease of assembly on the lateral sides of the leaves particularly easy to implement but which combines therewith, simple and effective possibilities for immobilizing and/or dismantling which, especially for the removal of the component, merely require a quick and easy manoeuvre.

To this end, the leaf equipped with the device in question is characterized in that it consists of a support component equipped with two parallel and symmetrical arms exhibiting elasticity in bending with respect to the component and capable of penetrating inside the groove of one of the slots which is made in one profile section of the leaf, designed to accommodate one of the rails for guiding the latter which is integral with the chassis, so as to engage a locking spur projecting

outwards and borne by each arm behind the edge of the profile section in the manner of a clip, the support component including, between its arms, an end piece equipped with an axial housing for the fitting of a peg
5 sliding in this housing, this peg ending in a head forming a push-rod for immobilizing the support component by the bearing of this head, on the outside of the end piece, on flanges turned back towards the inside of the groove and borne by the arms of this component at the
10 opposite end to the locking spurs.

According to the invention, the support component equipped with its flexible arms may very easily be fitted into the groove of a slot to be closed off partially in order to limit the height thereof so that when the
15 component is preferably bearing against the profile section in which this slot is made, the spurs of the arms engage behind the edge of the profile section, automatically attaching the component thereto. In this position, the arms can be locked by virtue of the head of the
20 sliding peg suitably pushed into the housing of the end piece, so that it comes into contact with the flanges, thereby immobilizing the spurs of the arms behind the profile section.

Advantageously, the support component is made by
25 moulding a plastic, the flexible arms being formed integrally with the component at the time of manufacture.

Also as a matter of preference, the head of the peg includes hollows opposite each other, designed to accommodate the ends of the lateral flanges of the arms
30 in the position of immobilization of the locking spurs.

According to another feature, the sliding peg comprises, to the rear of its head and facing each of the arms, median recesses such that a complementary thrusting force on the peg in its housing causes the head to escape
35 from the lateral flanges, making them engage in the recess, so as to release the locking spurs and allow the support component to be removed.

According to yet another feature, the sliding peg includes a shoulder, designed to come to bear against an

internal end-of-travel stop provided in the housing of the end piece, especially when the lateral flanges engage in the median recesses in order to release the locking spurs of the arms.

5 In a preferred embodiment of the invention, the support component includes a body with substantially rectangular cross-section, laterally exhibiting a notch for the passage of the rail for guiding the leaf and a bearing edge on the profile section accommodating the
10 arms, the end piece equipped with its axial housing being located under the lower edge of this notch in the mid-plane of the said rail.

Other features of an anti-lift-off device, particularly for a sliding leaf of a door, window or the
15 like, will become clearer through the description which follows of one embodiment given by way of non-limiting indication with reference to the appended drawings in which:

- Figure 1 is a diagrammatic perspective view of
20 a chassis equipped with a sliding leaf, on which anti-lift-off devices according to the invention are fitted.

- Figure 2 is a skeleton diagram illustrating, in transverse section on a larger scale, the process employed for fitting the leaf into its chassis, then for
25 fitting the device in question onto this leaf.

- Figure 3 is a part perspective view on a still larger scale, of part of the chassis and of its leaf after the device according to the invention has been fitted into one of the slide grooves for this leaf.

30 - Figure 4 is a perspective view of the lift-off device on an even larger scale, illustrating the various parts of the support component and of the sliding peg which locks it.

- Figures 5, 6 and 7 are views in transverse
35 section of the device according to the invention, corresponding respectively to the clipping of the support component of the device onto the profile section of the leaf in a slide slot therefor, to the same support component in the locked position relative to the profile

section by means of the peg, and finally to the position of the latter in which the component is released from the profile section.

5 In Figure 1, the reference 1 denotes a door or window with sliding leaves, which leaves can be equipped with an anti-derailment device according to the invention, in order in particular to make it possible to prevent the unintentional or unauthorized disengagement or derailment of these leaves.

10 The door 1 includes a chassis 2, of rectangular overall shape, consisting of a metal frame, whose top and bottom sides 3 and 4, which extend horizontally, exhibit, towards the inside of the rebate formed by this framing, guide rails 5 and 6 respectively.

15 Sliding leaves 7 and 8, each one in the embodiment represented consisting of a glazed surface 9 surrounded by a frame formed of profile sections 10 and 11 at the upper ends of each leaf, these horizontal profile sections being joined together on each side by vertical profile sections 12 and 13 respectively, are located in the chassis 2.

20 Vertically in line with the rails 5 and 6, the profile sections 10 to 13, which thus enframe the glazed surface 9 of the leaf, have open slots, respectively 14 at the top of the leaf, in the horizontal profile section 10 and the top ends of the vertical profile sections 12 and 13, and 15 in the lower profile section 11 and the bottom ends of these two same vertical profile sections 12 and 13, in order to accommodate the rails 5 and 6 of the chassis 2 and allow the sliding of the corresponding leaf in the conventional fashion. Advantageously, the slots of the two leaves 7 and 8 include small wheels or rollers for gliding (not represented) housed in the bottom of these slots and bearing on the rails which penetrate therein.

35 In practice, and as illustrated more clearly in Figure 3, the chassis 2 in each of its upper and lower sides 3 and 4 includes two parallel rails for the sliding of the two leaves 7 and 8 against each other, Figure 3

merely showing the corresponding rails provided in the upper side 3, identified by the references 5a and 5b, the rail 5a being reserved for the leaf 8, for example, and the rail 5b for the leaf 7, or vice versa.

5 In a way which is conventional in the art, and as illustrated diagrammatically by Figure 2, the slot 14 provided in the profile sections of each leaf at its upper part has a depth substantially greater than that of the slot 15 formed in the profile sections of the lower
10 part of this same leaf in order to allow the latter to be fitted inside the chassis 2. To this end, the procedure consists in engaging the rail 5 as far as it will go in the deepest slot 14, the leaf being offered up substantially vertically, so that the slot 15 can be brought
15 vertically in line with the rail 6. In this position, the leaf can be lowered slightly onto the latter rail, being capped by the slot 15, without the opposite rail 5 in any way escaping from its own slot 14 owing to the differences in height of these two slots.

20 Once the leaf has thus been fitted in its chassis, the groove 16 of the slot 14, especially at the ends thereof in the vertical profile sections 12 and 13 is partially closed off by a stop component 17, which fits into this groove as shown more particularly by Figures 2
25 and 3, the component 17 including a notch 18 for the passage of the corresponding rail 5, so as to allow free sliding of the leaf while preventing it from being possible for the latter to be lifted up, and especially to be disengaged, particularly during a break-in attempt,
30 or even on the occasion of an unintentional wrong move.

 As a general rule, the stop components 17 are only mounted at the upper ends of the sliding leaves in the grooves 16 of the deepest slots 14. Nevertheless, it goes without saying that similar components could also be
35 fitted into the homologous grooves of the slots 15 at the bottom of the leaves, each leaf thus being equipped with four stop components, and the chassis with a total of eight components.

 The perspective view of Figure 4, on the one

hand, and the sectional views of Figures 5, 6 and 7 on the other hand, illustrate the structure of the stop component 17 produced in accordance with the invention and making it possible to explain its assembly and its operation.

This component 17 includes a body 19 consisting of a bottom 20 and of a rim 21 designed to be applied against the face opposite of the vertical profile section, for example of the profile section 12, against which it bears when it is fitted into the groove 16 of the corresponding slot.

The body 19 is preferably made by moulding a plastic and has a rectangular overall profile, as Figure 4 in particular illustrates.

According to the invention, the bottom 20 of the component 17 is integral with two arms, 22 and 23 respectively, which extend perpendicularly to the plane of this bottom and which, by way of preference, are formed integrally with the component 17 during moulding. These arms 22 and 23 have a longitudinal dimension substantially greater than that of the rim 21 and thus extend beyond the end thereof which bears against the profile section 12, so as to be able to engage inside the groove 16 in the corresponding slot, namely the upper slot 14 in the views of Figures 5 to 7 in particular.

Each one of the arms 22 or 23 includes an outwardly projecting part forming a spur 24 and, beyond the latter, a flange 25 pointing towards the inside of the component, the spurs 24 of the two arms, and likewise their flanges 25, being arranged respectively facing one another in the way illustrated in the drawings. The two arms are symmetric with one another with respect to a mid-plane (not featured) of the component 17, which coincides in particular with that of the rail 5 engaged in the corresponding slot 14.

The component 17 moreover includes, substantially at its centre, an end piece 26, secured to the bottom 20 and having an internal housing 27 into which there is inserted a peg 28, the external profile of which

complements the internal profile of this housing. The peg 28 may thus slide freely in this housing under the effect of an appropriate tool, such as a punch or the like, not represented here.

5 The peg 28 at its front part which engages in the housing 27 of the end piece 26 has a head 29 joined to a body 30 situated at the rear of this head, by a linking element 31 of smaller cross-section, forming mutually symmetrical lateral recesses 32 between the head and the
10 body on each side of the peg. Finally, the head 29 advantageously includes hollows 33 on each side thereof, the depth of which is markedly less than that of the recesses 32.

 The stop component 17 is fitted into the
15 groove 16 of the associated slot in a very simple manner, as emerges especially from Figures 5 to 7 of the appended drawing.

 During the first phase of this fitting, the component 17 has its body 19 and the peg 28 arranged
20 relative to one another, as represented in Figure 5, the head 29 of the peg engaged in the housing 27 of the end piece 26 being barely flush with the end of the latter. The arms 22 and 23, whose nature (plastic identical to that of the body 19) and dimensions give them a certain
25 flexibility, can thus be bent slightly towards each other in order to engage in the groove 16 of the slot 14, the penetration of the arms in this groove being facilitated by virtue of a sloping region 34 which is advantageously provided in the outer parts of these arms, beyond their
30 spur 24.

 The component 17 can thus engage inside the groove in the manner of a clip, the elasticity of the arms 22 and 23 allowing them, after the spurs 24 at the end of the sloping regions 34 have got into the groove,
35 to separate outwards slightly so that these spurs can be accommodated behind the profile section 12, at the same time moreover as the rim 21 of the body 19 bears against the opposite face of this profile section on the outside of the groove 16, the relative dimensions of the rim and

of the arms in particular of the point where the spurs are formed thereon, being determined by construction as a function of the thickness of the profile section 12 onto which the component 17 is fitted.

5 The second phase of fitting then consists in exerting a thrust force on the sliding peg 28 so that it engages progressively in the housing 27 until the moment when the head 29 of this peg comes into contact with the flanges 25 of the arms 22 and 23. As the head 29 advantageously has a slightly bevelled frontal part 35, the
10 peg 28 continuing to move forces the flanges 25 outwards slightly until the ends thereof can engage in the hollows 33 of the head which immobilizes them, consequently holding the component 17 firmly secured to the profile
15 section 12. As before, the dimensions of the peg 28 and of the parts of the arms 22, 23 extending from the body 19 are determined by construction so that when the flanges 25 engage in the hollows 33 of the head 29 as explained hereinabove, the rear part of the body 30 of
20 the peg is exactly flush with the plane of the bottom 20, and especially does not project towards the outside of the body 19 so as to prevent untimely manipulation on the peg which thus remains completely non-obstructing inside the visible outline of the component 17 in that part
25 thereof which alone is accessible from outside the leaf. (See Figure 6).

 When, in contrast, one wishes to be able to remove the stop component 17, particularly to dismantle the leaf in order to repair or maintain it, all that is
30 required, as represented in Figure 7, is to exert an additional thrust force on the peg 28 so that the flanges 25 then escape from the hollows 33 of the head 29 and finally penetrate the recesses 32. In these conditions, the flanges 25 and subsequently the arms 22
35 and 23 are no longer locked by the peg, a force for extracting the body 19 allowing the spurs 24 to disengage from the groove 16, it then being possible for the component 17 to be pulled out as a whole in order to gain access to the slot 14. Advantageously, the housing 27

includes an internal shoulder 36 against which a bearing surface 37 made in the body 30 of the peg bears, so as to limit the travel thereof in the housing of the end piece 26 and particularly prevent it from escaping from
5 inside the slot when the component 17 is in place and when the aforementioned thrust force is exerted on the peg.

A device of very simple design which exhibits numerous advantages by comparison with prior embodiments
10 known in the art is thus produced, particularly by adopting a clip mechanism for fastening the component to the profile section in line with the groove of the slot to be closed off partially, while giving this component the capability of locking reliably when it is fitted,
15 without thereby preventing its subsequent removal which can also be achieved very easily.

The device according to the invention gives a substantial reduction in the cost of fitting the stop component. It affords guaranteed behaviour of this
20 component during manoeuvres or manipulation of the chassis or of its leaves, with a great possibility for reusing the component after dismantling, this dismantling being possible without any damage to the constituent parts. Furthermore, the device gives great security with
25 respect to any break-in attempt, the stop components mounted on the lateral sides of the leaves of the chassis being concealed inside the internal rebate of the latter accommodating them, particularly when the door or window is closed, this contributing to limiting the possibility
30 of these leaves being lifted in order to disengage them.



CLAIMS

1. Sliding leaf, especially of a door, window or the like, including a device for preventing derailing, the said leaf (7, 8) being mounted in a stationary supporting
5 chassis (2) and including a frame formed of profile sections (10, 11, 12, 13) including slots (14, 15) for engaging rails (5, 6) integral with the chassis (2) on which rails the leaf slides, characterized in that the anti-derailment device consists of a support component
10 (17) equipped with two parallel and symmetrical arms (22, 23) exhibiting elasticity in bending with respect to the component and capable of penetrating inside the groove (16) of one (14) of the slots which is made in one profile section of the leaf, designed to accommodate one
15 of the rails (5) for guiding the latter which is integral with the chassis, so as to engage a locking spur (24) projecting outwards and borne by each arm behind the edge of the profile section in the manner of a clip, the support component including, between its arms, an end
20 piece (26) equipped with an axial housing (27) for the fitting of a peg (28) sliding in this housing, this peg ending in a head (29) forming a push-rod for immobilizing the support component by the bearing of this head, on the outside of the end piece, on flanges (25) turned back
25 towards the inside of the groove and borne by the arms of this component at the opposite end to the locking spurs.
2. Sliding leaf according to Claim 1, characterized in that the support component (17) is made by moulding a plastic, the flexible arms (22, 23) being formed
30 integrally with the said component at the time of manufacture.
3. Sliding leaf according to one of Claims 1 and 2, characterized in that the head (29) of the peg (28) includes hollows (33) opposite each other, designed to
35 accommodate the ends of the flanges (25) of the arms (22, 23) in the position of immobilization of the locking spurs (24).
4. Sliding leaf according to any one of Claims 1 to 3, characterized in that the flanges (25) of the flexible



arms (22, 23) include sloping regions (34) for facilitating the engagement of the arms in the groove (16) of the slot.

5. Sliding leaf according to any one of Claims 1 to 4, characterized in that the sliding peg (28) comprises, to the rear of its head (29) and facing each of the arms (22, 23), median recesses (32) such that a complementary thrusting force on the peg in its housing (27) causes the head to escape from the lateral flanges, making them engage in the corresponding recess so as to release the locking spurs (24) and allow the support component (17) to be removed.

6. Sliding leaf according to Claim 5, characterized in that the sliding peg (28) includes a bearing surface (37) designed to come to bear against an internal end-of-travel shoulder (36) provided in the housing (27) of the end piece (26), especially when the lateral flanges (25) engage in the median recesses (32) in order to release the locking spurs (24) of the arms (22, 23).

7. Sliding leaf according to any one of Claims 1 to 6, characterized in that the support component (17) includes a body (20) with substantially rectangular cross-section, laterally exhibiting a notch (18) for the passage of the rail (5, 6) for guiding the leaf (7, 8) and a bearing rim (21) on the profile section accommodating the arms (22, 23), the end piece (26) equipped with its axial housing (27) being located under the lower edge of this notch in the mid-plane of the said rail.