



TRANSLATIONS

International Rogier Centre
20th floor - Box 362
1210 BRUSSELS

BUREAU DE TRADUCTIONS H. SINGER S.R.L.

I, L. HUBERT,

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BUREAU DE TRADUCTIONS H. SINGER
CENTRE INTERNATIONAL ROGIER 2^e ETAGE
PLACE ROGIER B^o 362
1210 BRUXELLES

certify that I am familiar with the English and French languages and that to the best of my knowledge and belief the attached document is a true translation, made by myself, of the description and claims of European Patent Application n° 87440053.4 du 10.09.1987, published under the N° 0262067

L. Hubert

Locking device, especially for a sliding wing

The invention relates to a locking device for the sliding wing of windows, doors or similar and that comprises, in its housing, a slide linked to a hook latch that co-operates with a keeper fitted solidly to the casing and held by a blocking device that displays a spring-loaded blocking lever, the top end of which can rest against the bottom narrow edge of the hook of the hook latch that blocks the operation of the slide in the locked position when the sliding wing disengages from the casing.

Through patent application EP-A-0246 172, considered under the terms of art. 54 (3) and (4) of CBE, we know a locking device, especially for the sliding wing of windows, doors or similar and that comprises, in its housing, a slide linked to a hook latch that co-operates with a keeper fitted solidly to the casing and held in its open position by a spring-loaded blocking device.

This blocking device comprises a guide located above the assembly and adjusting screw of the hook latch and that slides inside a case that traverses, from one side to the other, the latch holder fitted solidly to the slide. The aforesaid slide is being subjected to a displacement perpendicular to the direction of displacement of the slide and serves as support for a feeler.

In the open position, the feeler-guide assembly is pushed outwards by an elastic element, so that the feeler projects in relation to the narrow edge of the wing and that a boss of the guide co-operates with a stop face obtained through a step made in one of the two parallel walls of the housing. When the wing is being closed, the feeler will come to rest against the keeper and cause a rearwards displacement of the guide, which entails the dissolution of the co-operation between the boss of the guide and the stop face of the step in the housing wall. The slide can thus be returned to its locked position.

This device, however, has several drawbacks. As a matter of fact, since the guide is sliding in a case made in the latch holder of the slide, either the latch holder is oversized, especially in thickness which entails an increase in the thickness of the

housing and, consequently, of the wing, or the spring-loaded blocking device is relatively small, which diminishes the reliability of the aforesaid device. Furthermore, the latter can be used only with a specially designed specific latch holder.

5 Through document US-A-4 489 966 which served as a basis to the preamble of claim 1, we also know a locking device for the wing of windows, doors or similar and that pivots around a vertical axis. This locking device comprises, in its housing, a spring-loaded slide for the purpose of conferring on locking elements
10 an automatic locked position. These locking elements consist of a latch that co-operates with a first keeper and of a locking rod that co-operates with a second keeper, with the locking elements fitted solidly to the slide and the keepers fitted solidly to the casing. When the wing is being closed, these
15 keepers pass through openings made in the housing. Also provided is a blocking device that displays a spring-loaded blocking lever. The top end of the blocking lever can come to rest against the bottom narrow edge of the locking rod in order to keep the locking device in an unlocked position, with the point of contact
20 between the top end of the blocking lever and the bottom narrow edge of the locking rod being located above the top narrow edge of the opening that allows for the penetration of the corresponding keeper into the housing. In the event of a closing operation, this keeper thrusts the blocking lever back and under the action
25 of the spring element that links the slide to the housing, the locking device takes up automatically its closed position and the locking rod traverses automatically the opening made in the corresponding keeper.

30 This locking device, however, has several drawbacks. As a matter of fact, for each opening of the wing, the user needs to confer on the locking device an unlocked position by actuating the locking device. Furthermore, as there is a certain distance between the blocking lever/locking rod point of contact and the top face of the corresponding keeper, the wing can be opened without having
35 the blocking lever position itself underneath the locking rod and, after the opening, the locking device returns automatically to the locked position. Lastly, the blocking device can be

used only for locking devices that comprise a locking rod.

The purpose of this invention is to remedy these drawbacks. The invention as characterized under claim 1 allows for achieving this purpose by providing a locking device for the sliding wing of windows, doors or similar and that comprises, in its housing, a slide linked to a hook latch that co-operates with a keeper fitted solidly to the casing and held by a blocking device that displays a spring-loaded lever, the top end of which can come to rest against the bottom narrow edge of the hook of the hook latch that prevents the slide from moving towards its locked position with the keeper when the sliding wing disengages from the casing, characterized in that the locking device is designed for a sliding wing and in that the blocking device comprises a support lodged between two flanges of a U-shaped profile of the sliding wing and the rear face of which comprises a boss that engages an opening made in the bottom of the profile by coming to rest via its bottom shoulder, against the bottom narrow edge of this opening, with this support locked in position by holding means of the latter that co-operate with corresponding means of the sliding wing.

The advantages obtained through this invention consist essentially in that the blocking device is not dependent any longer on the thickness of the latch holder and that it can therefore be strengthened which reduces the possibility of damage and enhances its reliability. Furthermore, as a separate assembly, the blocking device can be fitted to existing sliding wings already provided with a locking device. Also, the design of the slide and of the latch holder has been simplified, which has a positive influence on their reliability while it allows for decreasing their cost price. A further advantage consists in that the blocking device moves underneath the keeper when the sliding wing is being closed which makes it impossible to lift the latter. In this manner the blocking device also plays a security role by preventing any attempt at removing the sliding wing from its hinges. Lastly, the wing can be operated at will and the locking device is brought into a locked position only through a deliberate operation performed by the user, which operation can be carried out only with the wing in closed position.

The invention will be explained below in greater detail by way of drawings that represent one form of embodiment only.

Figure 1 shows the locking device in conformity with the invention according to section I-I of figure 2.

5 Figure 2 shows a vertical projection and sectional view of the locking device in locked position.

Figure 3 shows a vertical projection and sectional view of the locking device in open position.

10 Figure 4 shows a top and sectional view according to section IV-IV, of the locking device as shown in figure 3.

We refer to these various figures.

15 The sliding wing 1 of a window, door or similar comprises a locking device 2. The latter comprises an outer plate 3 provided with a hub 4 in which a safety block 5 is lodged that can be actuated from outside by a key that passes through a hole 6 made in the front flange 7 of the aforesaid hub 4. Furthermore, the locking device 2 comprises an inner plate 8. The outer 3 and inner 8 plates are mounted against the outer faces 9, 10 of the sliding wing 1 that displays an opening 12 at right angles with the locking device, and they are held together by fastening elements 13.

20 The locking device 2 comprises a housing 15 that consists of two walls 16, 17, between which a slide 18 is moving that can be actuated by a handle 19 through an opening 20 made in the inner plate 8. This slide 18 is fitted solidly to a latch holder 21 that serves as a support for a hook latch 22 arranged perpendicularly in relation to the direction of displacement of the slide 18. This hook latch 22 comprises at least one hook 23 pointing downwards. The hook latch 22 projects in relation to the wall 17 of the housing 15 and moves between the two flanges 24, 25 of a U-shaped profile 26 that constitutes the narrow edge of the sliding wing 1. The bottom 27 of this profile 26 is provided with an opening 28 that allows for the passing and the

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vertical displacement of the hook latch 22. The hook latch 22 co-operates with a keeper 29 fitted solidly to the casing 30 and lodged between the flanges 31, 32 of a profile 33 that constitutes the narrow edge of the casing.

5 The locking device 2 comprises a blocking device 34. The latter consists essentially of a support 35 provided with holding and positioning means and with a blocking lever 36.

10 The support 35 is lodged between the two flanges 24, 25 of the profile 26 and its width 37 is slightly smaller than the space 38 between the inner faces 39, 40 of the two flanges 24, 25. The rear face 41 of the support 35 is mounted against the bottom 27 of the profile 26 and comprises a boss 42 that engages also the opening 28 made in the aforesaid bottom 27 of the profile 26. The bottom shoulder 43 of this boss 42 comes to rest against
15 the bottom narrow edge 44 of the opening 28. This bottom narrow edge 44 of the opening 28 constitutes one of the corresponding means of the sliding wing 1 that allows for positioning the blocking device 34. This bottom shoulder 43 of this boss 42 and the bottom narrow edge 44 of the opening 28 constitute the
20 positioning means of the blocking device 34. The height 45 of this boss 42 is slightly smaller than the thickness 46 of the bottom 27 of the profile 26 in order to prevent the rear face 47 of the boss 42 from impeding the displacement of the slide 18.

25 The rear face 41 is linked to the front face 48 by two slanted walls 49, 50. This front face 48 is off-set downwards in relation to the rear face 41 and comes to rest against two vertical bosses 51, 51 that project from the two inner faces 39, 40 of the two flanges 24, 25 of the profile 26, in the direction of the median plane 53. The front face 48 comprises a boss 54
30 in which a hole 55 is made. Into the latter is engaged a securing element 56, the truncated point 57 of which comes to rest against the bottom 27 of the profile 26. It would be advantageous for the securing device 56 to be a screw and, consequently, for the hole 55 to be a threaded hole. The rear face
35 41 displays a clearance 58 so that the securing element 56 is able to project. Thus, the locking means of the blocking device 34 consist of the screw 56. As a matter of fact, by actuating



Claims

1. Locking device (2) for a wing of windows, doors or similar and that comprises, in its housing (15), a slide (18) linked to a hook latch (22) that co-operates with a keeper (29) fitted solidly to the casing (30) and held by a blocking device (34) that displays a spring-loaded blocking lever (36), the top end (81) of which can come to rest against the bottom narrow edge (82) of the hook (23) of the hook latch (22), preventing the slide (18) from moving towards its locked position with the keeper when the wing disengages from the casing (30), characterized in that the locking device is designed for a sliding wing and that the blocking device (34) is an assembly separate from the housing (15) that contains the slide (18) and comprises a support (35) lodged between two flanges (24, 25) of a U-shaped profile (26) of the sliding wing (1) and the rear face (41) of which comprises a boss (42) that engages an opening (28) made in the bottom (27) of the profile (26) while resting with its bottom shoulder (43) against the bottom narrow edge (44) of this opening (28), with this support (35) locked into position by holding means (41, 48) of the latter that are co-operating with corresponding means (27, 44, 51, 52) of the sliding wing (1).

2. Locking device (2) according to claim 1, characterized in that, in the closed and locked position of the sliding wing (1), the support (35) is located underneath the keeper (29) of the casing, thus blocking any unhinging of the sliding wing (1) after the latter has been closed and locked.

3. Locking device (2) according to claim 1, characterized in that the support (35) has an axis (61) horizontally in parallel with the narrow edge of the sliding wing (1) and around which pivots the blocking lever (36).

4. Locking device (2) according to claim 1, characterized in that the boss (42) has a height (45) smaller than the thickness (46) of the bottom (27) of the profile (26).



5. Locking device (2) according to claims 1 and 3, characterized in that the support (35) that has a width (37) slightly smaller than the space (38) that separates the inner faces (39, 40) of the two flanges (24, 25) of the profile (26) of the sliding wing (1), comprises a rear face (41) mounted against the bottom (27) of the profile (26), a front face (48) off-set downwards in relation to the rear face (41) and that comes to rest against two vertical bosses (51, 52) that project from the two inner faces (39, 40) of the two flanges (24, 25) of the profile (26), and two slanted walls (49, 50) that link the front face (48) to the rear face (41) and that are arranged on both sides of a body (59).

6. Locking device (2) according to claim 5, characterized in that the front face (48) of the support (35) comprises a boss (54) provided with a hole (55) into which is engaged a securing element (56), the truncated point (57) of which comes to rest against the bottom (27) of the profile (26).

7. Locking device (2) according to claim 5, characterized in that the rear face (41) of the support (35) comprises a clearance (58) from which projects the truncated point (57) of the securing element (56).

8. Locking device (2) according to claims 1 and 5, characterized in that the holding means of the blocking device (34) are the securing element (56), the rear (41) and front (48) faces of the support (35) and the position off-set towards the bottom of the front face (48) in relation to the rear face (41), and the corresponding means of the sliding wing (1) are the bottom (27) of the profile (26) that co-operates with the securing element (56) and the rear face (41), and the two bosses (51, 52) of the two flanges (24, 25) of the profile (26) that co-operate with the front face (48) of the support (35).

9. Locking device (2) according to claim 1 and 3, characterized in that the support (35) comprises a vertical groove (60) that is traversed by the axis (61) and into which folds the blocking lever (36).



10. Locking device according to claims 1, 3 and 9, characterized in that the support (35) comprises a recessed hole (76) that opens into the vertical groove (60) and in which is lodged a spring element (74) that co-operates with a return arm (69) located at one of the ends of the blocking lever (36), the other end of which is provided with a control arm (79) that co-operates with the keeper (29) fitted solidly to the casing (30) when the sliding wing (1) is being closed.

11. Locking device (2) according to claim 10, characterized in that the control arm (79) displays a curve (83) located between the stop edge (81) and the top end (78) of the blocking lever (36), for the purpose of folding back, when the sliding wing (1) is being closed, the stop edge (81) between the two flanges (24, 25) of the profile (26) of the sliding wing.

12. Locking device (2) according to claim 5, characterized in that the body (59) of the support (35) comprises a section tapering in the direction of its vertical narrow edge (84) so as to facilitate its penetration between the two flanges (31, 32) of a profile (33) of the casing (30).



Summary

Locking device, especially for a sliding wing

5 Locking device (2), especially for a sliding wing (1) of windows, doors or similar, that comprises in its housing (15) a slide (18) linked to a hook latch (22) that co-operates with a keeper (29) fitted solidly to the casing (30) and held by a spring-loaded blocking device (34), the blocking device (34) of which is an assembly separate from the slide (18) and that
10 comprises positioning (42 to 44) and holding (41, 48) means that co-operate with corresponding means (27, 44, 51, 52) of the sliding wing (1).