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(71) Applicant: **Euroinvest S.r.L.**
55011 Altopascio (Lucca) (IT)

(72) Inventor: **Bellandi, Paolo**
51010, Uzzano - Lucca (IT)

(74) Representative: **Bardini, Marco Luigi et al**
c/o Società Italiana Brevetti S.p.A.
Corso dei Tintori, 25
50122 Firenze (IT)

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(54) **Abutment plate for a lockup mechanism of the wings of door/window units in metal section bars**

(57) An abutment plate (3) for a lockup mechanism of wings of a door/window unit made in metal section bar and comprising a fixed frame (1) and at least one wing (4) hinged to the frame (1). The plate (3) has a substantially squared shape with an internal arm (3b) attached in a grooved housing (2) formed along the edge of the frame and an external arm (3a) projecting therefrom and comprises holding means (10, 11, 12, 15, 16) suitable for fixedly engaging with two walls (2a, 2b) of the grooved housing (2) projecting internally one towards the other for locking said plate in said housing. In particular provision is made for two diverging locking tabs (16) extending from said internal arm and suitable for being bent, on assembly, for fixedly engaging under the wall (2b) of said housing. A squared appendage (12), formed through blanking from said external arm (3a) and extending therefrom, abuts on the same wall (2b) in a forced manner.

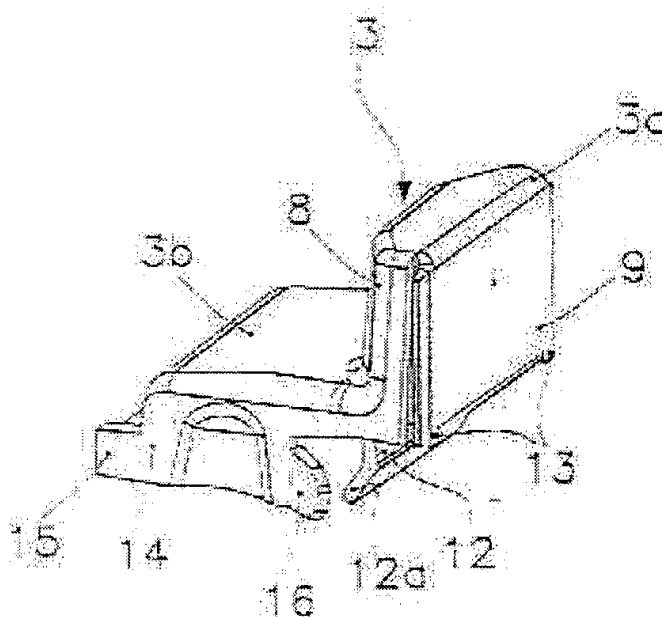


Fig. 2

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Description

[0001] The present invention relates to the field of accessories for door/window units in metal section bars, especially aluminium metal section bars. More particularly the present invention relates to an abutment plate used in the lockup mechanisms of door/window units in aluminium of the wing and tilt-and-turn type.

[0002] Prior art lockup mechanisms for door/window units comprise an actuating element, transmission elements and a device for locking the mobile structure to the relative frame. More particularly the fixed frame, integral with the wall and formed by a metal section bar, has a grooved housing formed longitudinally with two walls projecting one towards the other above it. An abutment element is attached in this housing and is formed by a squared plate with one arm projecting outwards. The wing associated with the frame, also made from a metal section bar, has a guide formed longitudinally on the side of the section bar corresponding to that of the frame where the plate is attached. A sliding rod is placed inside the guide and a ratchet is integral to the rod. When the ratchet is translated up to the height of the aforesaid plate, the wing is locked with respect to the relative frame, as the ratchet abuts on the projecting arm of the plate.

[0003] The abutment plate is currently attached to the grooved housing of the frame by means of connection elements such as for example self-threading screws or by means of systems using a stop dowel.

[0004] Solutions of this type do not allow the possibility of automating the operations required for fitting the abutment plate in the frame of the door/window unit, as they involve preliminary operations such as drilling in the case of a self-threading screw, and screwing in both the cases of use of dowels or screws. Moreover the required shape of the plates entails their manufacture in light alloys by moulding and subsequent machining, methods which, beside to affecting the cost of the lockup mechanism, do not guarantee their protection against corrosion phenomena caused by external agents.

[0005] The object of the present invention is to provide an abutment plate that simplifies the phase of assembly of the locking device in the lockup mechanisms of wings of a door/window unit in metal section bars in order to enable assembly of this device by means of automatic machines and therefore achieve easier large scale production of the door/window unit.

[0006] Another object of the present invention is to provide an abutment plate of the type mentioned above whose configuration is such as to allow production by plastic deformation.

[0007] These objects are achieved with an abutment plate for a lockup mechanism of wings of a door/window unit in metal section bars according to the present invention whose essential features consists in that the abutment plate is provided with holding means suitable for firmly engaging with the projecting walls of the grooved housing of the frame.

[0008] Moreover, according to a preferred embodiment, the holding means consist of appendages extending from the arms of the plate and to make the plate integral with the walls of the grooved housing and, therefore, with the frame.

[0009] Thanks to the use of the abutment plate according to the invention it is possible to adopt an automated procedure for its fixed connection in the housing formed on the respective metal section bar as the plate itself comprises the locking means, forming a single piece therewith without the need for further connection means such as, for example, self-screwing screws.

[0010] According to a preferred solution, the plate according to the invention, appropriately shaped and deformed to optimize its use, is made in stainless steel in order to obtain the tensional and elastic features required by the type of fixed connection to be achieved. This allows an abutment plate of smaller thickness and hence of lower weight to be produced, and which exhibits a sufficient resistance to corrosion phenomena without requiring further treatments, all this resulting in a significant cost reduction.

[0011] The invention will now be illustrated in greater detail with the following description of one of its embodiments, given by way of a non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 shows in a perspective view a detail of a door/window unit with a wing locking device comprising the plate according to the invention;
- Figure 2 shows a perspective view of the abutment plate according to the invention;
- Figures 3 and 4 show perspective views of the plate from the side of connection to the frame, in which side locking tabs are shown in an initial position and in a final position of assembly respectively;
- Figures 5a, 5b and 5c illustrate in greater detail, via side views, the sequence of assembly and insertion of the plate in the metal section bar, shown sectioned, forming the frame, according to the present invention.

[0012] Referring to Figure 1, 1 denotes a portion of fixed frame of a door/window unit, integral with a wall (not shown) and formed by a metal section bar having a grooved housing 2 formed longitudinally, with two walls 2a and 2b projecting one towards the other above said housing. In the housing 2 an abutment element is attached, formed by a plate 3 with a substantially squared shape, and with an arm 3a projecting outwards. 4 denotes a wing associated with the frame 1, also formed by a metal section bar and having a guide 5 formed longitudinally on the side of the section bar corresponding to that of the frame 1 where the plate 3 is attached. Inside the guide 5 a sliding rod 6 is arranged, and a ratchet 7 projects from rod 6. The movement of ratchet 7 up to the height of the plate 3 causes locking of the wing 4 in relation to the frame

1 as the ratchet 7 abuts against the projecting arm 3a of the plate 3.

[0013] Referring to Figures 2, 3 and 4 and going into greater detail, the abutment plate 3 according to the present invention is formed by the aforesaid arm 3a, called external arm, and by a further arm 3b substantially perpendicular one to the other. The arm 3b is referred to as internal arm herein below, is so far as it is the arm which engages in the grooved housing 2 of the frame 1. According to a preferred embodiment the abutment plate 3 is formed by a metal section bar shaped through plastic deformation. The external arm 3a is formed by two faces 8 and 9 bent one over the other, one of which, in particular the face 8, is connected to the arm 3b, while the face 9 is kept slightly apart from the face 8. Three front appendages extend from the free edge of the internal arm 3b. Two of these appendages, denoted by 10, extend from the end portions of the free edge and have a substantially squared shape. The third front appendage, denoted by 11, is arranged in an intermediate position on the free edge in a spaced relation to the other two appendages and is turned forwards in relation to the internal arm 3b.

[0014] From the face 9 of the external arm 3a a rear appendage 12 extends, obtained through blanking of the same face. The rear appendage 12 therefore has a smaller width than that of the face 9 wherefrom it is obtained and extends from two side supports 13 of the face 9. Rear appendage 12 is substantially shaped as a square bent under the external arm 3a and has a free edge 12a slanted forwards and acting as an inlet guide for engaging in the groove 2.

[0015] Two walls 14 extend from the side edges of the internal arm 3b at the opposite side with respect to the arm 3a and substantially perpendicular to the lying plane of arm 3b. Each wall 14 extends from one side as far as the free edge of the internal arm 3b and projects beyond it with a tooth 15 coplanar to the wall 14 and with a substantially square shape, suitable for inserting under the wall 2a when the plate is mounted in housing 2. On the side of the external arm 3a, each wall 14 ends with a side or locking tab 16 bent outwards in relation to the side profile of the internal arm 3b and with a length shorter than the distance of its root from the free edge of the face 9.

[0016] Referring now to Figures 5a to 5c, the abutment plate 3 is connected to the frame 1 thanks to the front appendages 10 and 11 of the internal arm 3a, the rear appendage 12 of the external arm 3b and the locking tabs 16 of the side walls 14. The appendages 10, 11 and the teeth 15 are engaged, as shown in the mentioned figures, between the walls 2a and the bottom wall of the housing 2. More particularly Figure 5a shows the starting slant along which the plate 3 has to be arranged in the initial phase of assembly in relation to the housing 2. Assembly is carried out by first inserting the front appendages 10, 11 and the teeth 15 in the recess formed by the wall 2a in the direction indicated by arrow A. Subsequently, as shown in Figure 5b, by pushing the plate towards the housing 2, in the direction indicated by arrow B and taking advantage of the inlet guide free edge 12a of the rear appendage 12, the latter is engaged in the housing 2 until it abuts against the wall 2b. The slight slant of the face 9 in relation to the face 8 of the external arm 3b allows a moderately forced insertion of the rear appendage 12 in the housing 2 that allows possible minor adjustments of the position before final locking. Finally, as shown in Figure 5c, locking tabs 16 are bent one towards the other until they are fixedly engaged under the wall 2b so as to lock, thanks to the slight slant 16b of their end, the plate 3 in the vertical direction.

[0017] The plate 3 is locked in the housing 2 basically thanks to the locking tabs 16 which, once bent until substantially coplanar to the respective walls 14, fixedly engage under the wall 2b, preventing both sliding along the housing 2 and disengaging therefrom. The front appendages 10 and 11 instead provide for the abutment with the wall 2a and the bottom wall of the housing 2, while the rear appendage 12 provides a forced abutment for the wall 2b.

[0018] The plate 3 is advantageously made in a metal material such as for example, and preferably, stainless steel, suitable for undergoing the sequence of the necessary operations of plastic deformation. The use of stainless steel is particularly advantageous in that it helps preventing the corrosive damage that is typical of the abutment plates currently in use, that are made in lightweight alloys undergoing oxidation more easily than stainless steel.

[0019] The abutment plate according to the invention allows performance of the operations of assembly by means of automatic machines, thus solving the problem faced with the prior art. In fact the operations required for completing the sequence of assembly of the plate 3 according to Figures 5a to 5c consist of linear spatial movements applied to a single component by means of automatic machines.

[0020] Moreover the features of the plate according to the present invention allow the effect of the cost of the lockup mechanism on the cost of the entire door/window unit to be reduced thanks to two main factors, namely the possibility of large scale production of a single element formed from sheet metal and the relative lower costs associated with the type of material used, which does not need to be undergone antioxidising treatments.

[0021] The invention is not limited to the embodiment described and illustrated above, but also includes any variation of manufacture thereof as set forth in the following claims.

Claims

1. Abutment plate (3) for lockup mechanism of wings of a door/window unit in metal section bar, said door/window unit comprising a fixed frame (1) and at least one wing (4) hinged to said frame, along an edge of said wing a guide (5)

being formed wherein a rod (6) is slidingly mounted, said rod holding a ratchet (7) projecting therefrom, a grooved housing (2) being correspondingly formed on said frame (1), with two walls (2a, 2b) projecting one towards the other above said housing, said plate having a substantially squared shape with an internal arm (3b) attached in said grooved housing and an external arm (3a) projecting therefrom and being **characterized in that** it comprises holding means (10, 11, 12, 15, 16) suitable for fixedly engaging with said walls (2a, 2b) for locking said plate (3) in said housing (2).

2. Abutment plate according to claim 1, wherein said holding means comprise shaped appendages (10, 11, 12, 15, 16), extending from the front and the sides of said internal arm (3b) and from the rear of said external arm (3a).
3. Abutment plate according to claim 2, wherein the appendage (12) extending from the rear of said external arm (3b) has a substantially squared shape which extends under said external arm and is suitable for abutting on one of said walls (2b) when the plate is arranged in said housing.
4. Abutment plate according to claim 3, wherein said external arm (3b) is formed by two faces (8,9) bent one over the other, one of said faces (8) being connected to the internal arm (3b), the rear appendage (12) extending from the other face (9) and having a width smaller than that of said face (9).
5. Abutment plate according to claim 4, wherein the face (9) wherefrom the rear appendage (12) extends has a slight slant outwards in relation to the other face (8) of the external arm in order to achieve forced abutment with said wall (2b).
6. Abutment plate according to any one of claims 3, 4 or 5, wherein said rear appendage (12) extending from the rear of said external arm (3a) has a slanted free inlet edge (12a).
7. Abutment plate according to any one of the previous claims, wherein side walls (14) extend from said internal arm (3a), substantially perpendicular to the lying plane of said arm, respective side locking diverging tabs (16) extending from said side walls (14), towards said rear appendage (12) and shorter in length than the distance between their root and said external arm, yet sufficient for abutting, on assembly in said grooved housing (2), against the housing wall (2b), when said tabs are bent to a coplanar position relative to their respective side walls (14).
8. Abutment plate according to claim 7, wherein said locking tabs (16) have at their end a slanted part (16a) for fixedly engaging against said wall (2b), on the opposite side with respect to said tabs said side walls (14) extending with respective parallel teeth (15) suitable for engaging under the other wall (2a) of said grooved housing (2).
9. Abutment plate according to any one of the previous claims, wherein a front appendage (10) extends from said internal arm (3b), suitable for abutting, on assembly, on the bottom wall of said grooved housing (2) under the corresponding wall (2a).
10. Abutment plate according to claim 9, wherein said front appendage is formed by a pair of substantially squared appendages (10) extending at the ends of the free edge of said internal arm (3b) and an intermediate appendage (11) extending centrally from the same edge and parallel to the lying plane of said internal arm (3b).

