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(54) SLATTED SHUTTER SYSTEM COMPRISING AN IMPROVED SELF-LOCKING DEVICE

(57) The invention relates to a slatted shutter system comprising an improved self-locking device. More specifically, the invention relates to a self-locking shutter system which does not require intermediate elements in the form of sections. The inventive system consists of: a pair of track guides (2) comprising interlocking openings (21) which are spaced uniformly along the length thereof; at least two contiguous slats (1) comprising complementary through holes (120, 121) which are provided in the lateral area that extends inside the track guides; and at least one locking device (3) which is mounted between the contiguous slats such as to extend through the aforementioned complementary holes in order to be locked in the interlocking openings when the slatted shutter is fully deployed or with the exertion of an upward force (F1), and which retracts from said interlocking openings (21) with the application of a downward lifting force (F2) which is exerted by means of a mechanism for lifting/lowering the shutter material.

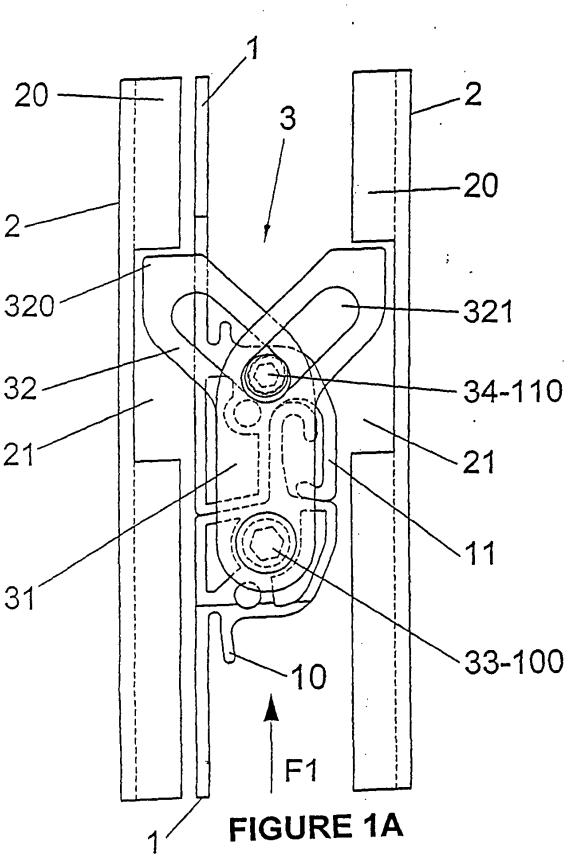


FIGURE 1A

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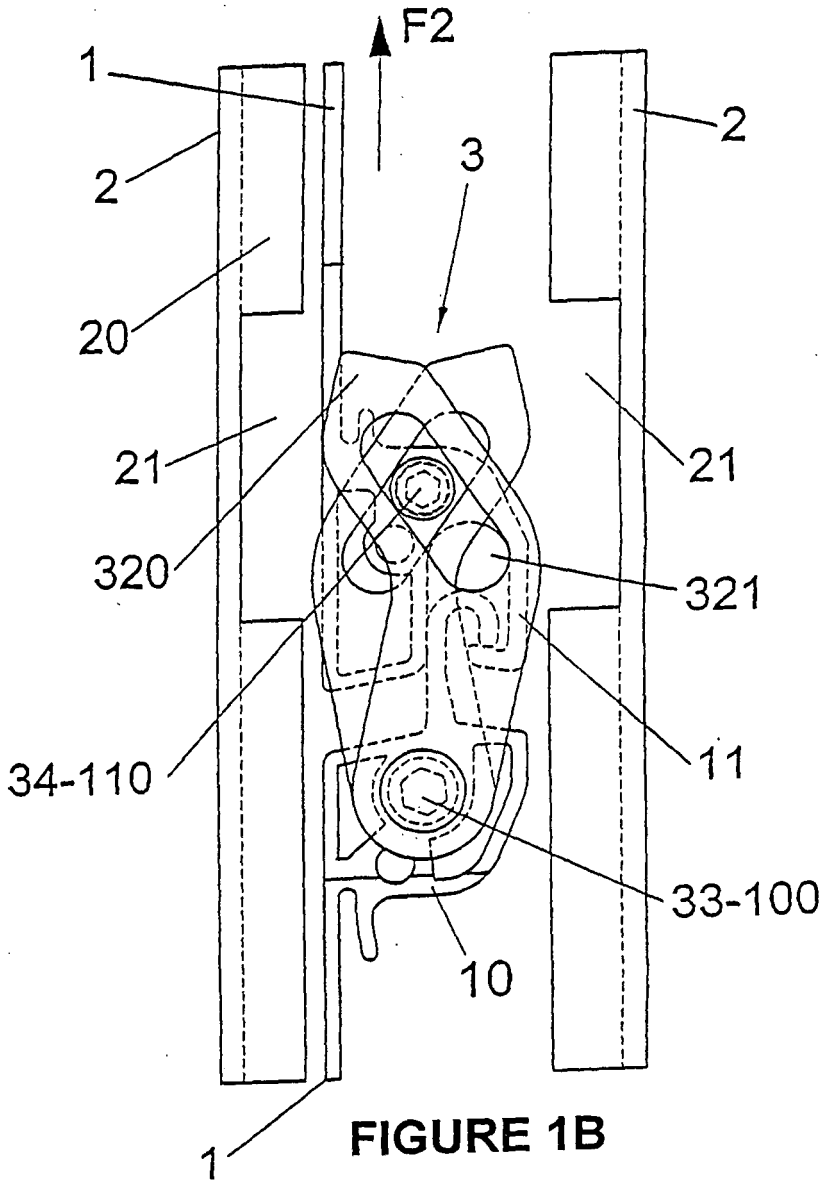


FIGURE 1B

Description

FIELD AND PRIOR ART

[0001] This invention is applicable to the cladding industry, specifically to those claddings consisting of blinds of a large opening, that are opened and closed through a rolling-up system, as in the case of garage doors, shop doors other and similar doors, for instance.

[0002] It should be mentioned that the object of the self-locking systems is to prevent the blind from being opened when it is fully unfolded, i.e. when it is closed, through a force applied upwards, either from the exterior or from the box where the rolling drum of the blind is located, or through any other means other than the mechanism or device used to raise the blind.

[0003] Currently, roller blinds of this kind, with an automatic locking system consisting of intermediate slat-like parts or sections linked to each other and to the slats of the blind, are already known.

[0004] This known arrangement involves several inconveniences. On the one part, it is necessary to use slats convex towards the exterior, and on the other part the presence of the above mentioned intermediate parts or sections should be taken into account. In fact, this configuration offers, on the one part, a somewhat unpleasant visual aspect which is rejected by users, and on the other part it prevents or restricts, for instance, the decoration with signs or other ornamental items, as it is presently required by many applications.

OBJECT OF THE INVENTION

[0005] The object of this invention is to solve the already mentioned problems of the prior art. According to the invention, the start point is to provide a blind with a self-locking system that, apart from incorporating the safety features required, allows to use blind slats of any external shape, both in the front and the rear sides, and without the need for intermediate locking parts or items with the shape of a profile.

[0006] This task is achieved according to the characteristics of the first claim. Advantageous additional characteristics of the invention are described in the dependent claims.

[0007] According to the invention, the roller blind system formed by revolving slats linked to each other, with a cross clearance achieved by means of complementary coupling parts, longitudinally profiled at their upper and lower edges and operated through a raising / lowering mechanism is characterized by:

- A pair of guiding rails for the blind slats, each one of them having opposite guiding walls with uniformly spaced locking holes arranged along them;
- At least, two adjacent slats, whose respective complementary coupling parts contain holes running parallel among them along each slat, such adjacent slats incorporating complementary openings in the side area of their body running inside such guiding rails; and
- At least, a locking device installed at each side between two adjacent slats, that can extend through the complementary openings of the adjacent slats and become locked at the locking holes of the guiding rails when the slat blind is fully unfolded or when an upwards force is applied, and that withdraws outside the locking holes when the raising force is applied from upwards through the raising mechanism of the blind.

[0008] According to a preferred embodiment of the invention, the locking device consists of two locking levers, each one of them incorporating a straight portion with a hole at the lower end and a bent portion forming an angle of 45°, with a pointed end and an extended groove running longitudinally towards such pointed end, such locking levers being articulated around an axis of rotation passing through the hole of the lower end which is coupled inside the hole of the upper coupling part of a blind slat and a pin that runs through the extended grooves of each locking lever and the hole of the lower coupling part of the adjacent upper blind slat, the bent ends of the locking levers with their pointed ends being extended towards the exterior and coupling with the locking holes of the guiding rails when the slat blind is fully unfolded or when the force is applied from the bottom part to the upper part, and withdrawn outside the locking holes of the guiding rails when a force is applied to raise the blind from upwards, through the blind raising mechanism.

[0009] According to an advantageous embodiment of the invention, the locking holes may be provided by means of bars with flat projections uniformly spaced longitudinally, that are secured by means of screws passing through the holes made in longitudinal housings formed in the opposite guiding walls by means of hook-shaped flanges.

[0010] According to a further characteristic of the invention, the blind slats incorporate side corner pieces, with the shape of a lid, mounted by means of screws and sockets on the holes foreseen at the complementary coupling portions of the slats that, according to the invention, incorporate a lining made of an elastomeric material to reduce the noise caused by the movement of the slats.

BRIEF DESCRIPTION OF DRAWINGS

[0011] Other characteristics and advantages of the invention will be clearly understood with the help of the following description and the attached drawings related to a non limitative embodiment example, where:

Figures 1A and 1B show respectively a central cross sectional view of the blind system according to the invention at the area of a guiding rail, with the blind fully closed and while it is being raised through its

raising mechanism.

Figures 2A and 2B show views similar to those of figures 1A and 1B, but through a side section.

Figures 3A and 3B show a perspective view of two adjacent blind slats in accordance with the invention system, duly assembled and disassembled, respectively.

Figures 4A to 4C show a detailed view of an embodiment of the guiding rails of the blind system according to the invention.

Figure 5 show a partially cut perspective view of two adjacent slats of the system according to the invention, showing a detail of their side corner pieces.

DETAILED DESCRIPTION OF AN EMBODIMENT

[0012] As it is well known, a roller blind system consists of a blind section formed by a plurality of articulated and revolving blind slats 1 with a cross clearance with respect to its length achieved through complementary coupling portions 10,11 longitudinally profiled at their upper and lower edges, where such blind section can be raised or lowered, to open or close it, by means of a manual or automatic mechanism, not shown, that facilitates the rolling of such blind slats around a blind drum, not shown.

[0013] According to the invention, as shown in an especially clear way in figures 1 to 4, the blind system consists of a pair of guiding rails 2 for the blind slats, each one having opposite guiding walls 20 where the respective locking holes 21, uniformly distributed throughout its length, are arranged.

[0014] In this system, at least two adjacent blind slats 1 have their respective complementary coupling portions 10, 11 where, according to the invention, the respective holes 100, 110 made along each slat and running parallel among them are foreseen. Furthermore, such adjacent slats 1 incorporate in their body 12, a series of complementary passing openings 120, 121 at the side area running inside such guiding rails 2.

[0015] A locking device 3 is arranged at each side between two adjacent blind slats 1 to extend through the complementary openings 120, 121 of the slats and aimed at becoming locked at the locking holes 21 of the guiding rails 2, when the slat blind is fully unfolded or when an upwards force F1 is applied, and which is also foreseen to withdraw outside such locking holes 21 when applying the raising force F2 from upwards through the raising mechanism of the blind. In this paragraph and the following ones, it should be understood that the force F1 refers to a force exercised downstream of a pair of adjacent blind slats that incorporate the safety device and that the force F2 is a force exercised upstream from the last pair of slats equipped with the locking device.

[0016] Referring again to figures 1 to 3, it can be observed that the locking device 3 consists of two locking levers 30, each one consisting of a straight portion 31 with a hole 310 at its bottom end, and a bent portion 32 forming an angle of approximately 45°, with a pointed end 320 and an extended groove that runs longitudinally towards such pointed end. Such locking levers 30 are articulated around an axis of rotation 33 that runs through the hole 310 of the lower end which, in turn, is coupled inside the hole 100 of the upper coupling portion 10 of a blind slat 1 and a pin 34 that runs through the extended grooves 321 of each locking lever and the hole 110 of the lower coupling portion 11 corresponding to an upper adjacent blind slat 1:

[0017] This way, the bent portions 21 of the locking levers 30 with their pointed ends 320 will be divergent towards the exterior, fitting into the locking holes 21 of the guiding rails 2 when the slat blind is fully unfolded or when a force F1 is exercised upwards, and will be withdrawn from such coupling hole when a force F2 is applied upstream the slats to raise the blind through the blind raising mechanism.

[0018] As it can be appreciated in greater detail in figures 4A to 4C, the locking holes 21 of the opposite walls 22 of the guiding rails 2 can be provided with bars 4 with flat projections 40 uniformly spaced throughout their length and that are fixed by means of headless screws 41 passing through the holes 42 to longitudinal housings 22 formed in the opposite walls 20 of the guiding rails 2 through hook-shaped flanges 23.

[0019] A preferred embodiment of the invention is that when the blind slats incorporate side corner pieces 5 with the form of a lid mounted by means of screws 50 and sockets 51 on the respective holes 101, 111 of the coupling portions 10, 11 that also incorporate a lining 52 made of an elastomeric material to achieve a reduction of the noise generated when the blind is raised or lowered.

[0020] Once the object of the invention has been sufficiently described, it only remains to point out that any embodiment consisting of changes in the shape or materials and similar changes, as well as those embodiments derived from a routine application of the above description must be considered as included within the scope of the invention, so that the invention is only limited by the scope of the following claims.

Claims

1. A rolling slat blind system with an improved self-locking device with a blind section consisting of revolving articulated slats (1) with a cross clearance achieved through complementary coupling portions (10, 11) longitudinally profiled at their upper and lower edges which is operated by means a raising / lowering mechanism, such system being **characterized in that** it includes:

    - A pair of guiding rails (2) for the blind slats, each one incorporating opposite guiding walls (20) with their respective locking holes (21) uniformly distributed throughout their length;

- At least, two adjacent slats (1) having at their respective complementary coupling portions (10, 11) a series of holes (100, 110) that run parallel throughout each slat, such adjacent slats (1) incorporating in their body (12) a series of complementary passing openings (120, 121) at the side area running inside such guiding rails;
- At least a locking device (3) mounted at each side between two adjacent slats that can extend through the complementary openings (120,121) of such adjacent slats (10, 11) to lock itself at the locking holes (21) of the guiding rails when the slat blind is fully unfolded or when a force (F1) is exercised upwards and which withdraws from the locking holes (21) when a raising force (F2) is applied from the upper part through a raising / lowering device of the blind section..

2. A rolling slat blind system with an improved self-locking device according to claim 1, **characterized in that** the locking device (3) consists of two locking levers (30), each one of them having a straight part (31) with a hole (310) at its lower end and a bent section (32) forming an angle of approximately 45° with a pointed end (320) and an extended groove (321) that runs longitudinally towards such pointed end, such locking levers being articulated around an axis of rotation (33) passing through the hole (310) of the lower end which is coupled inside the hole (100) of the upper coupling portion (10) of a blind slat (1) and a pin (34) running through the extended grooves (321) of each locking lever and the hole (110) of the lower coupling portion (11) of an upper adjacent blind slat (1), the bent ends of the locking levers having their pointed ends (320) diverging towards outside fitted into the locking holes (21) of the guiding rails (2) when the slat blind is fully unfolded or when a force (F1) is applied upwards and which withdraw from outside such locking holes (21) when a raising force (F2) is applied on the blind from upwards through the raising mechanism of the blind.

3. A rolling slat blind system with an improved self-locking device according to claim 1, **characterized in that** the locking holes (21) of the locking devices consist of bars (4) with flat projections (40) uniformly distributed throughout their length, that are fixed by means of headless screws (41) passing through holes (42) of such flat projections inside longitudinal housings (22) made at their opposite guiding walls (20) by means of hook-shaped flanges (23).

4. A rolling slat blind system with an improved self-locking device according to one of the previous claims, **characterized in that** the blind slats incorporate side corner pieces (5) with the shape of a lid mounted by means of screws and sockets (51, 52) on holes (101, 111) made in the complementary coupling portions (10, 11) and that include a lining (53) made of elastomeric material to reduce the noise generated by the movement of the slats.

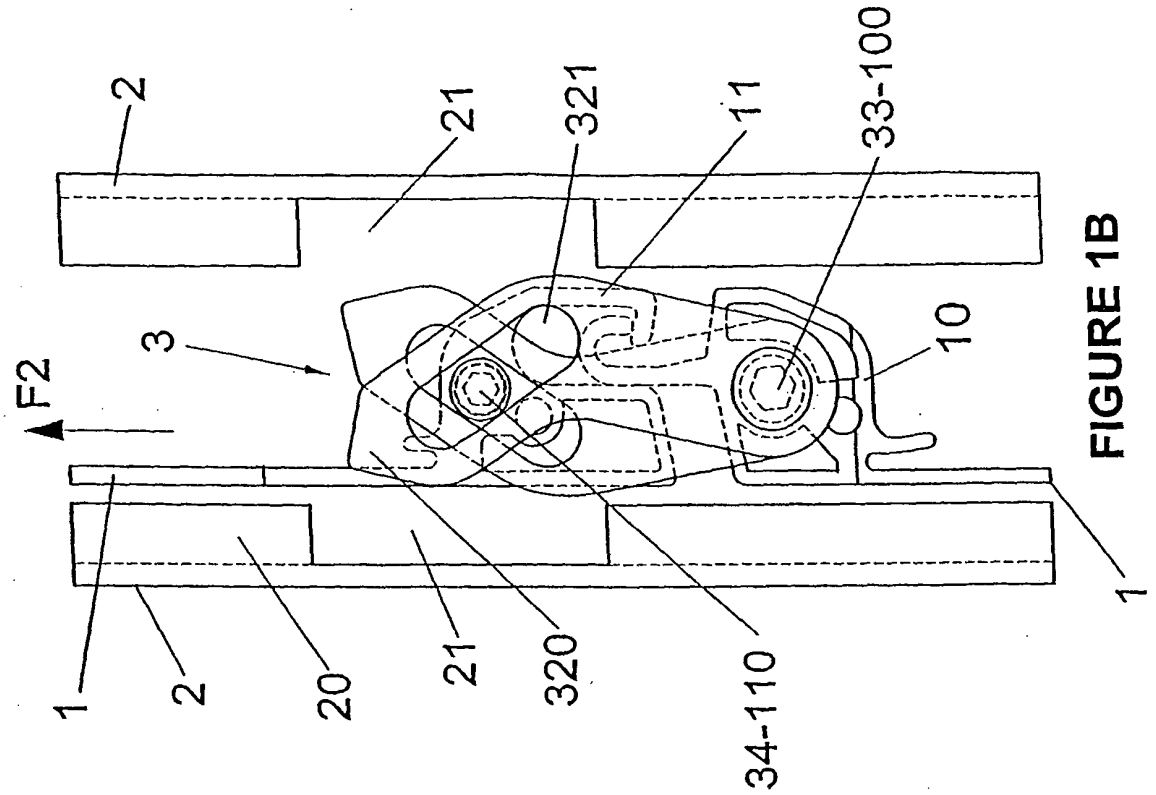


FIGURE 1B

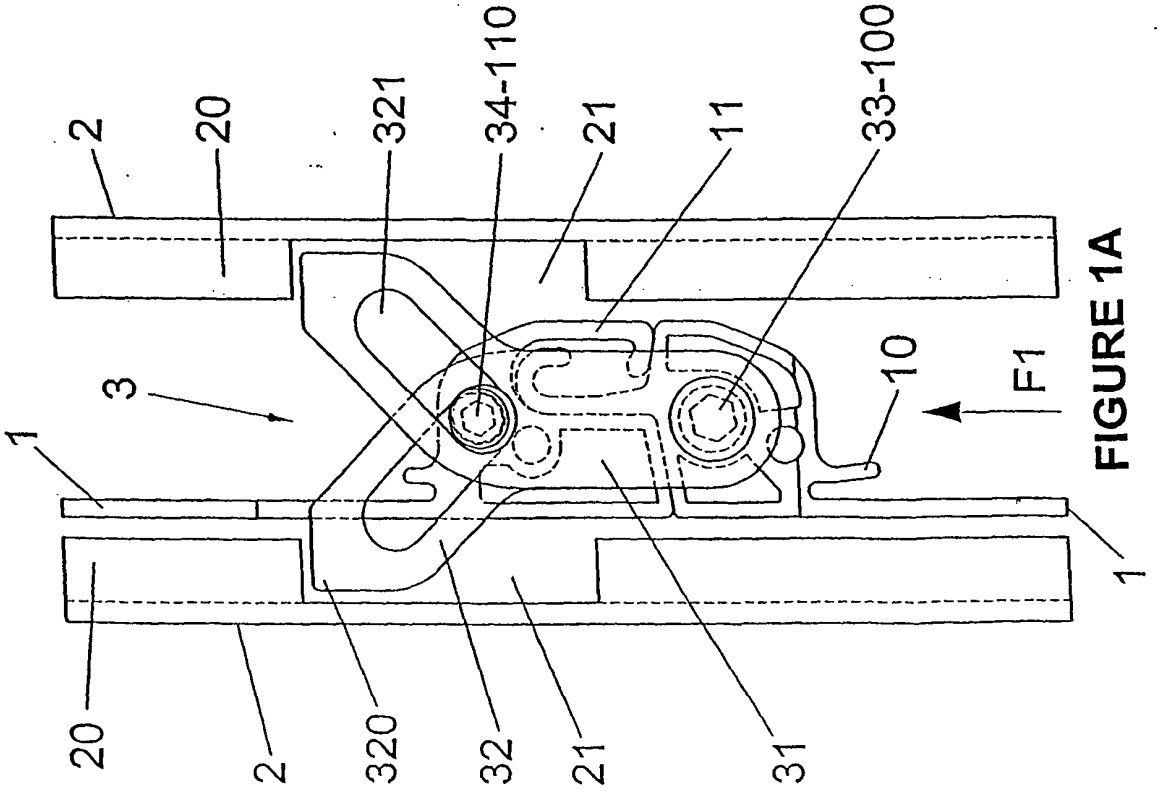


FIGURE 1A

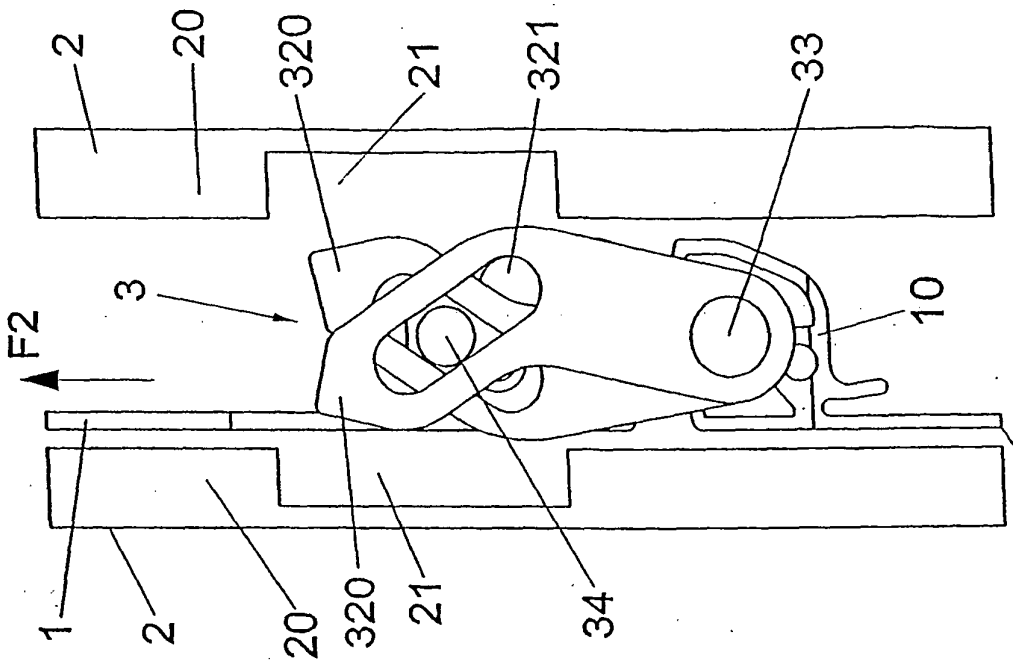


FIGURE 2B

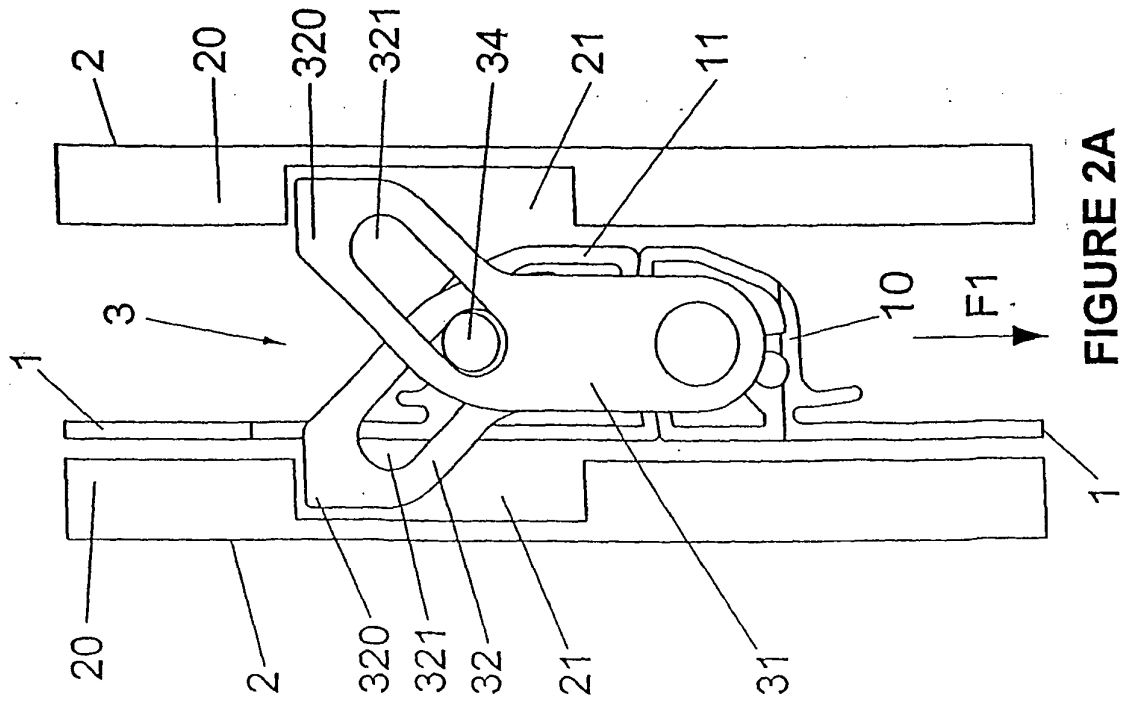


FIGURE 2A

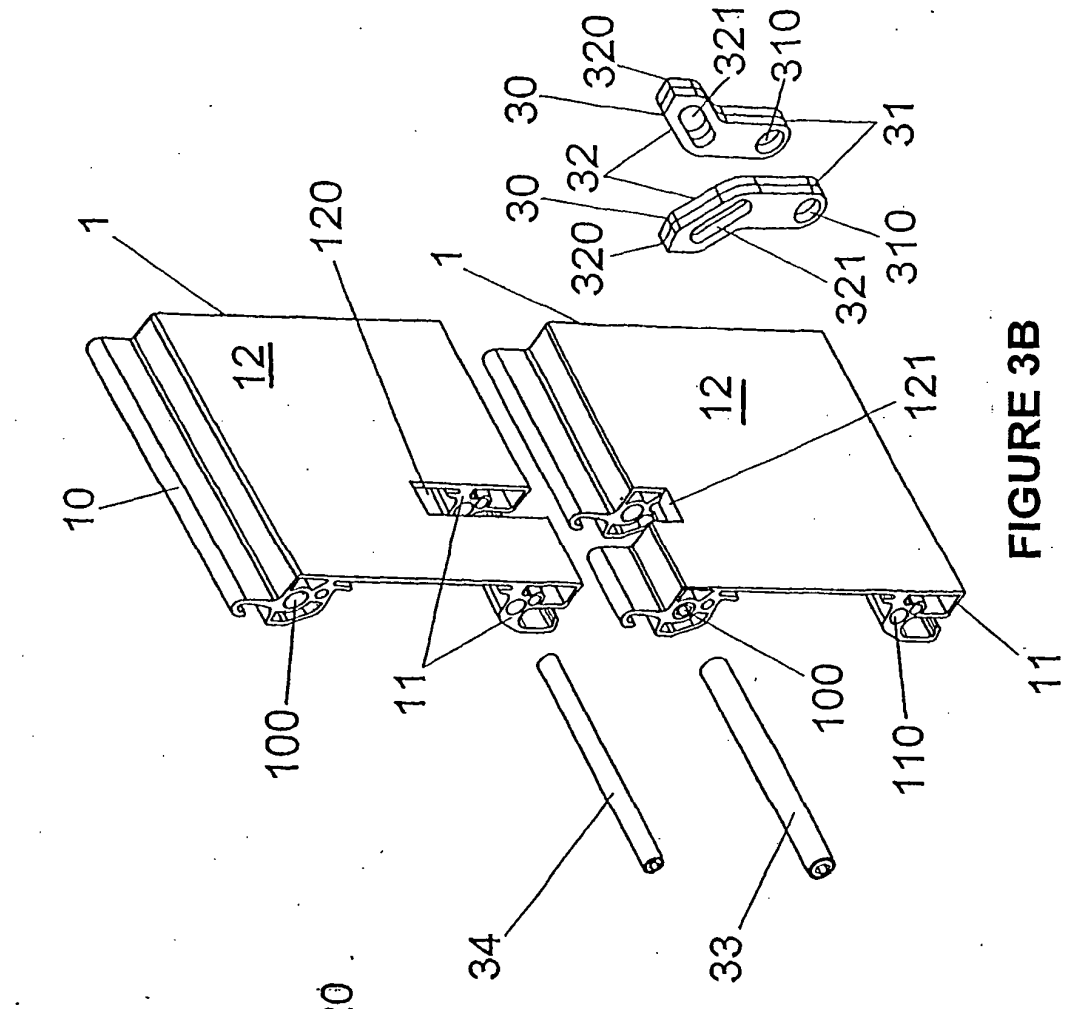


FIGURE 3B

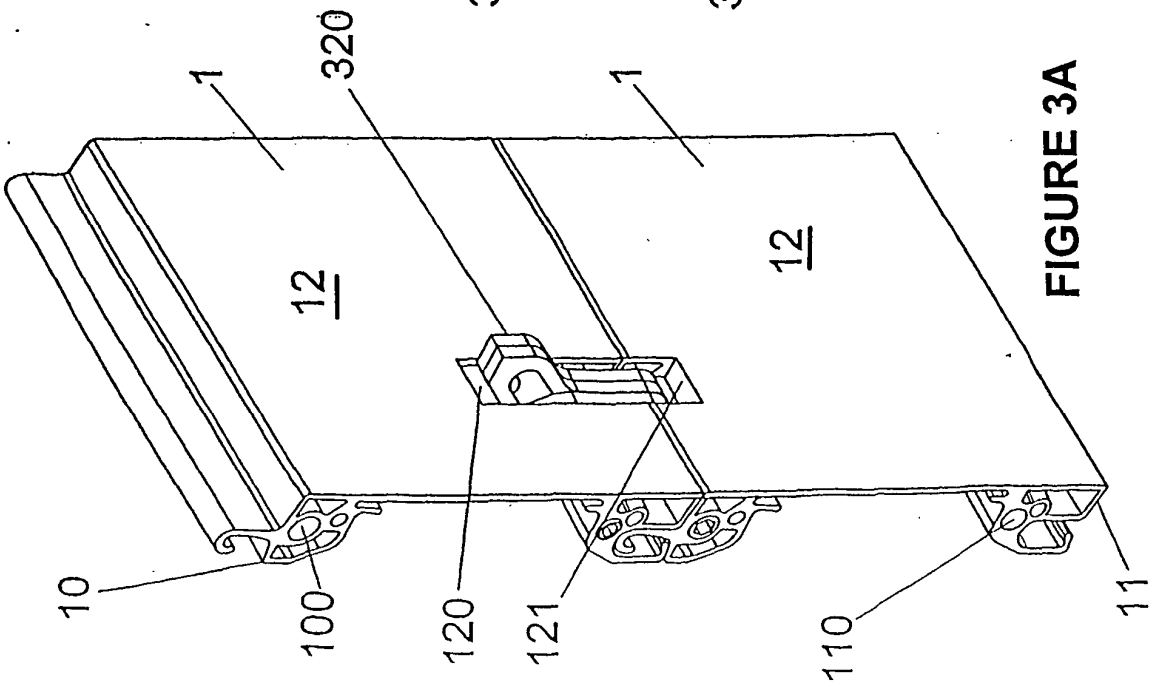


FIGURE 3A

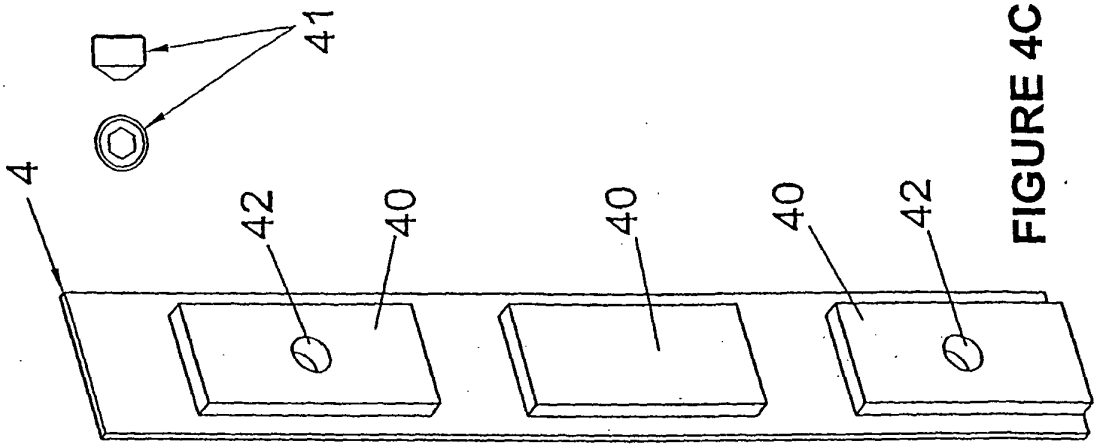


FIGURE 4C

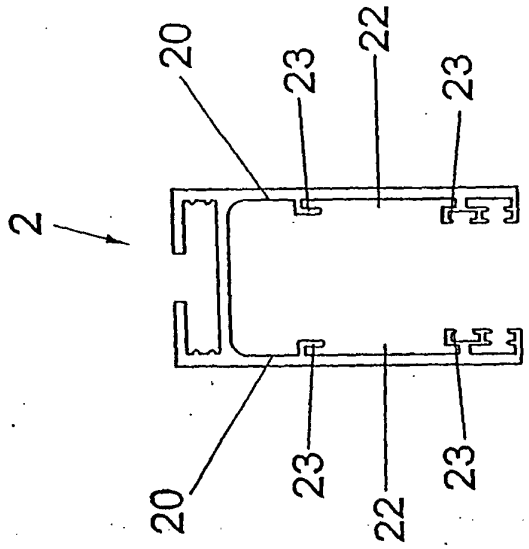


FIGURE 4B

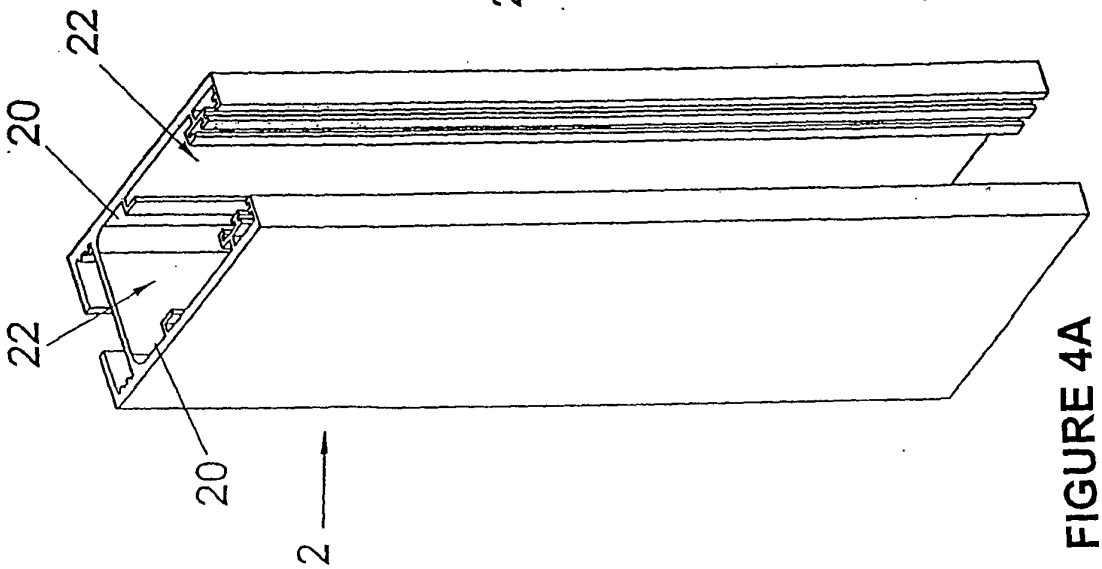


FIGURE 4A

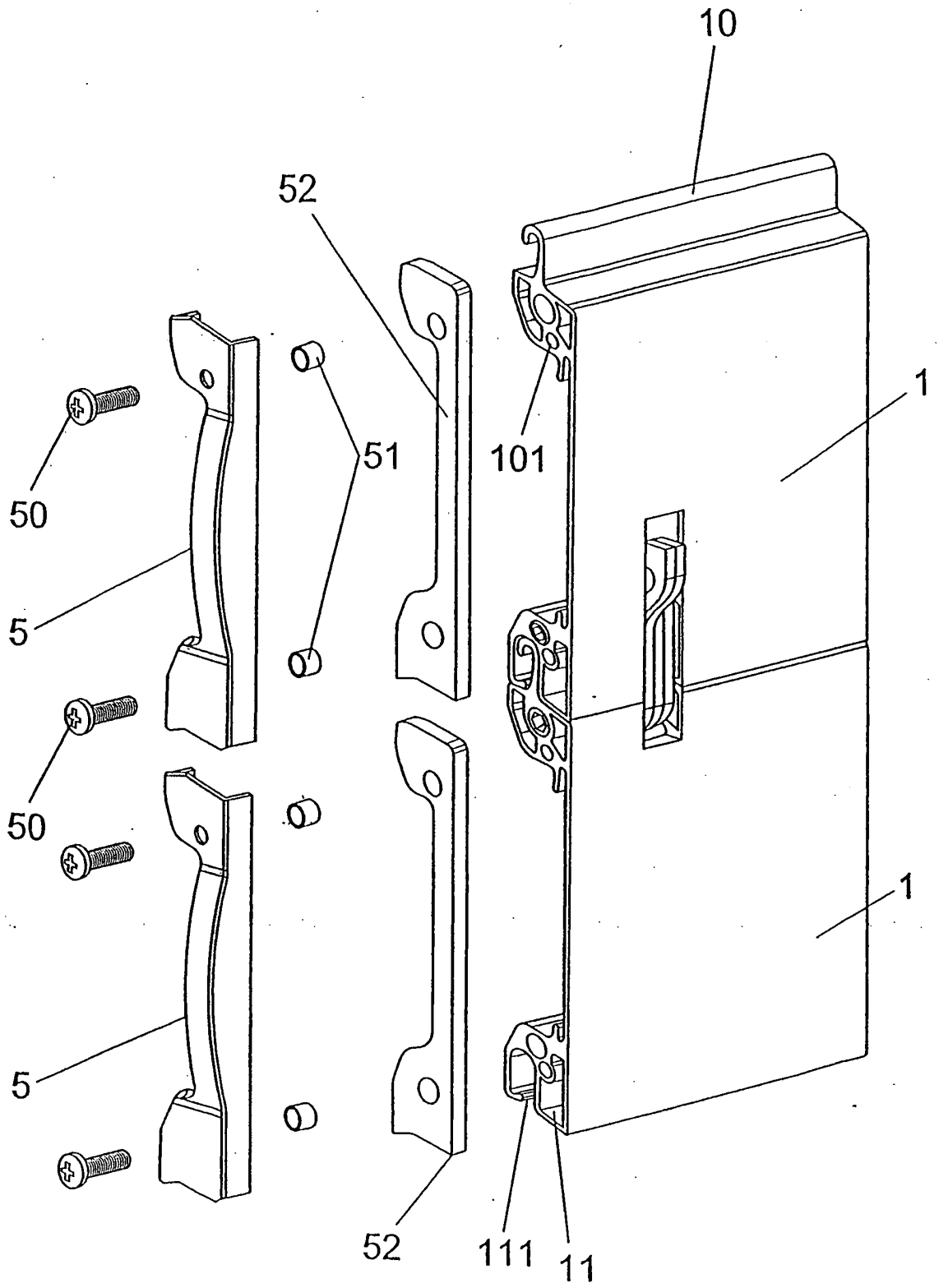


FIGURE 5