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(54) **Support and anchorage device for sliding doors**

(57) Support and anchorage device for sliding doors including a guide profile of the type with a «C» section, internally equipped, at the base wall, with a multitude of teeth, and provided with at least one through-hole for the engagement of the same to an appropriate seat obtained within the extent of the upper edge of a sliding door, where, inside the mentioned guide profile, a pin-holder

stirrup is positioned, including an upside down and elongated metallic element shaped like a «C», in the centre of which is a through-hole for a threaded pin of the type equipped with a head, the same shaped metallic element, at one of the two ends is equipped with a passing seat for the engagement of a pulling pin.

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## Description

**[0001]** This invention relates to a support and anchorage device for sliding doors.

**[0002]** The proposal, finds particular, but not exclusive application in the sector of the industry for the production of devices for the equipment of doors and windows, particularly doors of the sliding type.

## DOMAIN OF THE INVENTION

**[0003]** Doors and windows of the sliding type are well-known. Such solutions of doors and windows, with particular reference to sliding doors, find specific use in building structures in which it is provided to execute a division of the internal spaces intent on allowing use also of the surface which, otherwise, should be reserved in order to allow the opening of a conventional door on hinges. Schematically, with particular reference to sliding doors of the disappearing type, they include a series of fixed element to be integrated into the wall structure, and a series of movable elements, to be used during the installation phase, to then be removed at a later phase. Substantially, a counterframe is integrated into the wall structure. The mentioned fixed elements are provided to be associated to the wall structure and include at least one caisson to constitute the structure within which the door panel will be contained once the same has slid until the opening position, as well as a door slam post to be anchored to the wall on the vertical profile of the door frame opposite that of the positioning of the mentioned caisson, in such a way as to allow, once placed in closure, that the door abuts on it. Moreover, above the same caisson, a longitudinal guide is engaged, which is screwed to said load-bearing structure. In order to allow the effective movement in opening and closing of the door, the presence of a sliding track is conventionally provided, to which same, by convenient means, the door is suspended.

## PRIOR ART

**[0004]** In order to allow the opening and closing movement of the door, it is usually provided that the sliding track, placed on the upper part of the caisson structure, is equipped with sliding means usually of the trolley type to which same, by conventional threaded means, the upper edge of the door is joined by means of the use of appropriate support devices.

**[0005]** In the current technical outline, multiple solutions of support devices for sliding doors are found.

**[0006]** A first solution is disclosed in US5907890 (Radaelli), in which the description of a guiding device for a sliding door is found, which contains a guide bar and a supporting element for a door, where said supporting element slides along said guide bar. Both the guide bar and the supporting element for the door have cylindrical coupling surfaces. The pair of sliding elements comprises ball sleeve bearings placed inside a cylindrical tube,

which is integral with the respective door supporting element. The connection of the supporting element to the door panel occurs by means of the use of threaded fastening means.

5 **[0007]** A second solution is described in JP6146726 (Yamamoto). In the aim of the applicant, such a solution is proposed to facilitate height regulation of the door panel relatively to the guide track and prevent the possibility of slack caused by prolonged use. The solution provides a  
10 lever body consisting of a vertical screw joined to a threaded seat with a mounting seat mounted on the surface of the upper edge of the door panel. A suspension and support means of the sliding type, is placed on the sliding track and is joined to the upper part of the rod of  
15 the screw lever body, which is allowed to rotate around an axis. A locking seat is obtained in the end part of a through-hole, through which said suspension and support means rod is inserted. Moreover, a protruding locking means, of the type engageable and disengageable  
20 from a lock seat, is obtained on the upper part of the end of said rod. It is provided that the length of the threaded screw lever body, placed between the suspension support element and the door panel, can be regulated through the rotation of the screw lever body so that the  
25 mentioned protruding locking means during the mounting of the door panel, is released from said locking seat, to then be locked into the said locking seat.

## PRIOR ART CLOSEST TO THE INVENTION

30 **[0008]** Another known solution of a support device for doors of the sliding type is found in F02001 A000009 (Scigno) and consists in equipping the upper edge of the door with appropriate seats, placed on each of the  
35 two lateral ends of the mentioned upper edge. Inside each seat, the positioning of a support device including a guide is provided, usually consisting of a metallic section with a «C» like section and provided with holes for the engagement of threaded fixing means thereby of  
40 which the latter, the anchorage of each guide to the corresponding seat of the door is obtained. Inside the mentioned guide two metallic wedges are positioned with an oblique cut at 45°, reciprocally engaged by means of a threaded fixing means, where the reciprocal tightening  
45 by means of the mentioned threaded fixing means, causes them to be offset towards two opposite sides of said guide and to lock the assembly in such a way. One of the two wedges is provided to be equipped with an orthogonal through hole for the engagement of a threaded pin of the type equipped with a head, able to be screwed  
50 onto the corresponding threaded seat, with which the sliding trolley is provided, sustaining the door panel to the guide track.

## DISADVANTAGES

**[0009]** Up to now, the background art highlights how the known solutions of support and anchorage devices

for sliding doors still have limitations.

**[0010]** A first limitation, in the opinion of the applicant, consists in the difficulty in obtaining an optimal support of the sliding door avoiding the disadvantage that the slackening of the pin-holder stirrup can provoke an undesired sliding of the same inside the guide profile with consequent negative repercussions as to the stability of the sliding door.

**[0011]** An additional limitation, also in the opinion of the applicant, consists in the considerable weight of the current solutions, a point which reflects negative effects on storing and transportation costs.

**[0012]** Another limitation, in the opinion of the applicant, consists in the fact that the current solutions of support devices for sliding doors do not seem optimized from a constructive and industrialisation viewpoint.

**[0013]** In connection with the abovementioned, the need arises to find alternative and more functional solutions, with respect to the current ones.

**[0014]** The aim of this invention is that of prearranging a support and anchorage device for sliding doors, which allows to ensure an effective support, avoiding the disadvantages deriving from the possibility of slackening of the pin-holder stirrup.

#### SUMMARY OF THE INVENTION

**[0015]** This and other aims are reached with this invention according to the characteristics included in the claims, solving the problems shown by a support and anchorage device for sliding doors including a guide profile of the type with a «C» section, internally equipped, at the base wall, with a multitude of teeth, and provided with at least one through-hole for the engagement of the same to an appropriate seat obtained within the extent of the upper edge of a sliding door, where, inside the mentioned guide profile, a pin-holder stirrup is positioned, including an upside down and elongated metallic element shaped like a «C», in the centre of which is a through-hole for a threaded pin of the type equipped with a head, the same shaped metallic element, at one of the two ends is equipped with a passing seat for the engagement of a pulling pin.

#### ADVANTAGES

**[0016]** In this way, through the appreciable creative contribution, the effect of which constitutes immediate technical progress, some advantageous objectives are achieved.

**[0017]** A first advantageous aim consists in realizing a support and anchorage device which allows to ensure an optimal anchorage of the pin-holder stirrup to the guide profile so as to avoid the disadvantages deriving from a possible slackening of the pin-holder stirrup following mounting.

**[0018]** Another advantageous aim consists in realizing a support and anchorage device for sliding doors, which,

due to the particular structuring, allows to realize a device with appreciably contained weight.

**[0019]** A further advantageous aim consists in realizing an alignment device for the installation of sliding doors whose structure is such as to simplify the entire installation phase itself reducing working times and, consequently, containing the respective costs.

**[0020]** These, and other advantages will appear from the following detailed description of at least one preferred solution with the aid of the enclosed schematic drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

##### **[0021]**

Figure 1 represents an exploded view of the support device, object of this invention.

Figure 2 represents an assembly view of the support device along the longitudinal axis and partially in section, object of this invention.

Figure 3 represents a lateral view of the invention of figure 2.

Figure 4 represents a plan view, from above, of the guide profile of the device, object of this invention.

Figure 5 represents a side view of the guide profile of figure 4.

Figure 6 represents a head view of the guide profile of figure 4.

Figure 7 represents a view of the support device, object of this invention, applied to the door.

#### DESCRIPTION OF AN EMBODIMENT

**[0022]** Taking the figures also as reference, it is observed that this invention consists of a support and anchorage device for sliding doors A including a metallic guide profile 1 with a «C» shaped section, where, in the embodiment which is described, the base wall 101 of the guide profile 1 is provided, either partially or for the whole of its development, with a multitude of contiguous teeth 2. In more detail, it is provided that the mentioned teeth 2 are placed on the internal side 111 of the base wall 101. The provided teeth 2 are placed in such a way as to be orthogonal in relation to the development of the length of the base wall 101 of the guide profile 1 to which they belong. Though the length of said teeth 2 is able to be such as to equal the measurement of the width of the base wall 101, in the embodiment described, their length is such as to be less in relation to the measurement of the width of the base wall 101 and said same teeth 2 are placed in a central position in relation to such latter base wall 101. In order to allow the guide profile 1 to be able to be fixed to the upper edge of the door 50, it is provided that, likewise, on the mentioned base wall 101, said guide profile 1 is equipped with appropriate through-holes 102, usually provided with countersinking, for the engagement of fastening means, conventionally of the threaded type. Opposite the mentioned base wall 101, the guide profile

1, exactly the «C» like shape that characterizes the section, has a first folded edge 103 and a second folded edge 104 both placed in such a way as to be parallel in relation to the provided base wall 101 and orthogonal in relation to each of the two side-walls 105, 106 these latter connect said first folded edge 103 and said second folded edge 104 to the base wall 101. Furthermore, the first folded edge 103 is folded as much as said second folded edge 104 and are provided, in an area corresponding to that in axis with each of the aforementioned through-holes 102, with recesses 131, 141, specularly symmetrical one to the other, such as to allow the passage of the head of the corresponding fixing means for the joining of the guide profile 1 to the sliding door 50, in such a way as to allow, consequently, the possibility of engagement of the same. Internally to the aforementioned guide profile 1, in the space delimited by the assembly consisting of the mentioned base wall 101, two side-walls 105, 106, the first mentioned folded edge 103 and the second mentioned folded edge 104, the positioning of a pin-holder stirrup 3 is provided, the latter, in the embodiment described, includes a shaped metallic element 31, usually realized by means of the cutting and folding of a metallic rolled section, shaped like an upside down and elongated «C», in the centre of which is a metallic block 4 and, through both, a hole 311 appropriately calibrated to allow the passage of a threaded pin 5 equipped with an engagement head 51. Said metallic block 4, in order to allow the locking of the threaded pin 5, is provided to be equipped with a locking screw 41. Each of the two opposite ends 32, 33 of the mentioned shaped metallic element 31, is shaped in such a way as to realize a folding which includes a vertical wall 321, 331, below which there is an oblique extension 322, 332. Each mentioned oblique extension 322, 332, is provided to be, in the example, of a smaller width in relation to the width of the mentioned vertical walls 321, 331, such as to equal the length of the described teeth 2 of the base wall 101 of the guide profile 1. Said pin-holder stirrup 3 is provided to be further equipped, on one of the two vertical walls 321, 331 with a passing seat for a pulling means 6. In the embodiment described, the pulling means 6 consists of a pulling pin, the activation of which allows the expansion of the oblique extension 322 to which it belongs, allowing the locking of the pin-holder stirrup 3 within the extent of the guide profile 1.

## Claims

1. Support and anchorage device for sliding doors of the type including a guide profile 1 with a «C» section provided with through-holes 102 for the engagement of fastening means, as well as a pin-holder stirrup 3 of the type equipped with a threaded pin 5 with an engagement head 51 **characterised in that** said guide profile 1, on the internal side 111 of the base wall 101, is equipped with teeth 2.

2. Support and anchorage device for sliding doors according to claim 1 **characterised in that** the pin-holder stirrup 3 includes a shaped metallic element 31, shaped like a «C», where one of the two ends 32 is equipped with a passing seat for a pulling means 6.
3. Support and anchorage device for sliding doors according to claims 1 and 2 **characterised in that** said shaped metallic element 31 is shaped like an upside down and elongated «C», in the centre of which is a metallic block 4 and, through both, a hole 311 constituting the passage of a threaded pin 5 equipped with an engagement head 51, where said metallic block 4, is equipped with a locking screw 41 and each of the two opposite ends 32, 33 of the shaped metallic element 31, is shaped in such a way as to realize a folding which includes a vertical wall 321, 331, below which, there is an oblique extension 322, 332.
4. Support and anchorage device for sliding doors according to previous claims **characterised in that** each oblique extension 322, 332 is of a smaller width in relation to the width of the vertical walls 321, 331.
5. Support and anchorage device for sliding doors according to previous claims **characterised in that** said pulling means 6 is a pulling pin.

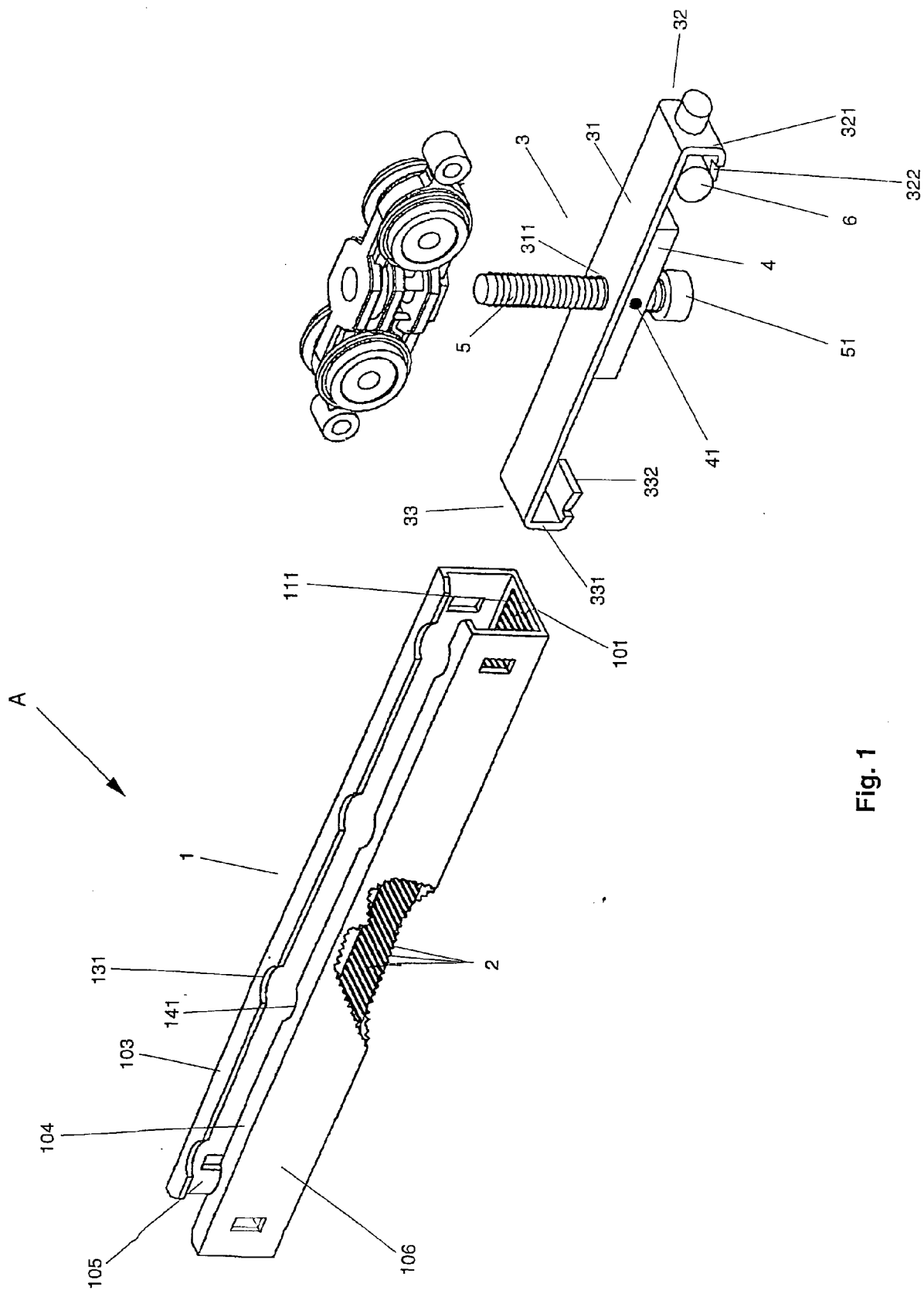
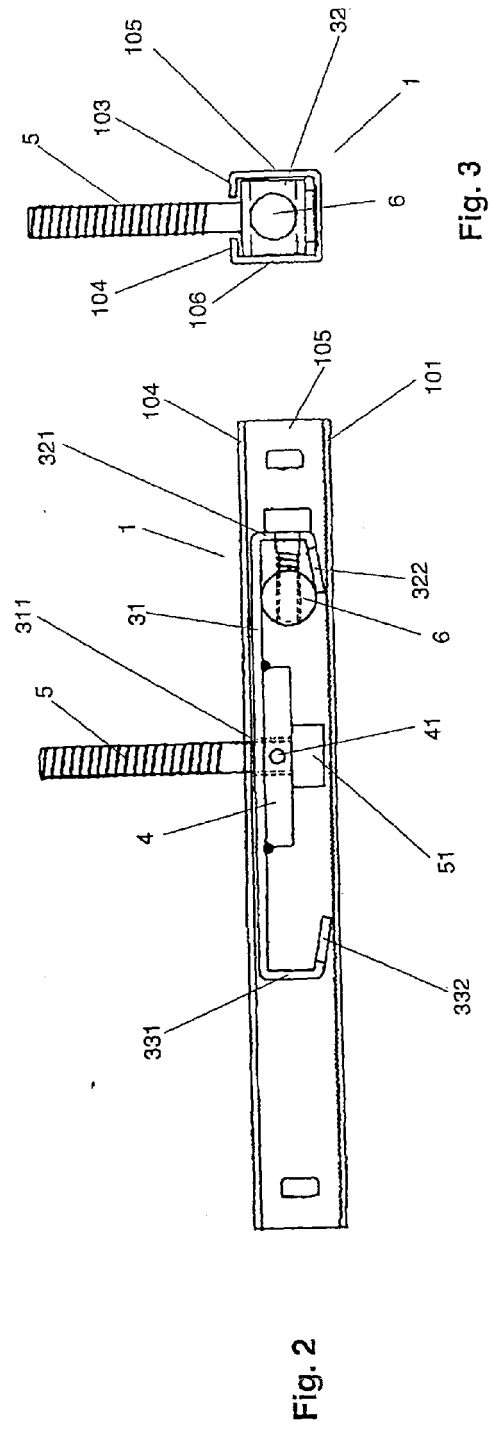
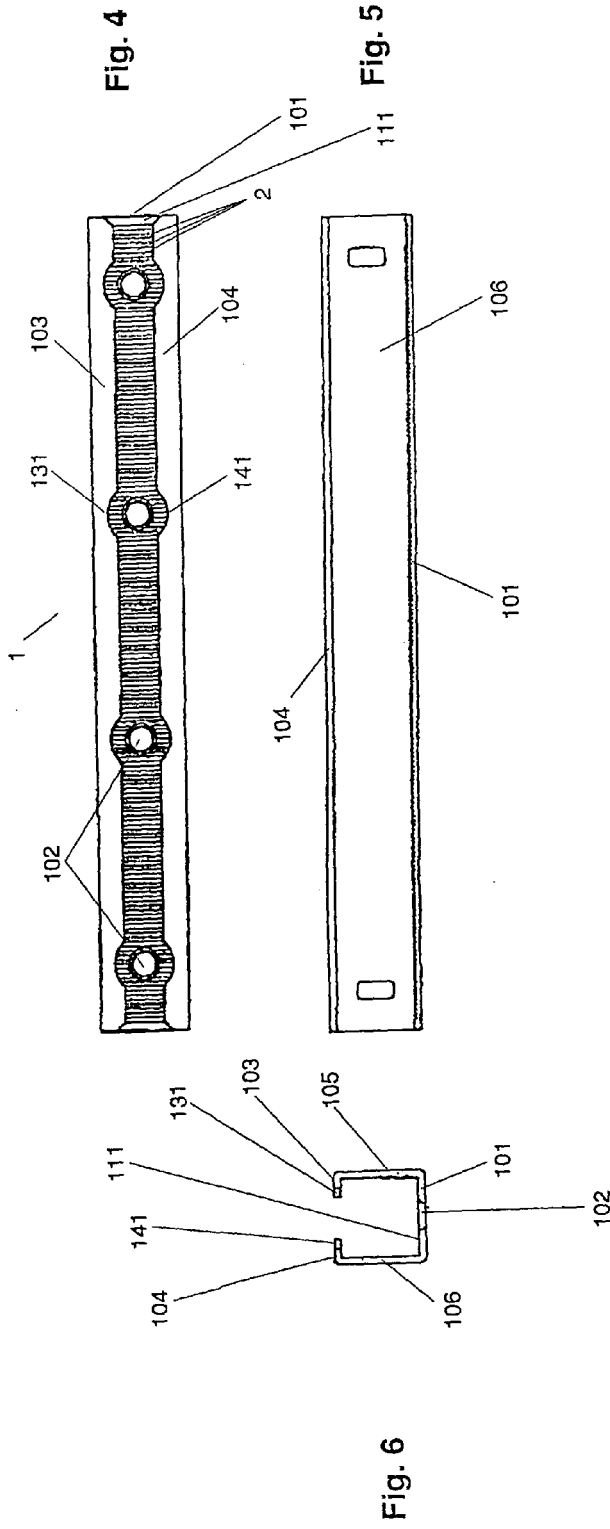


Fig. 1



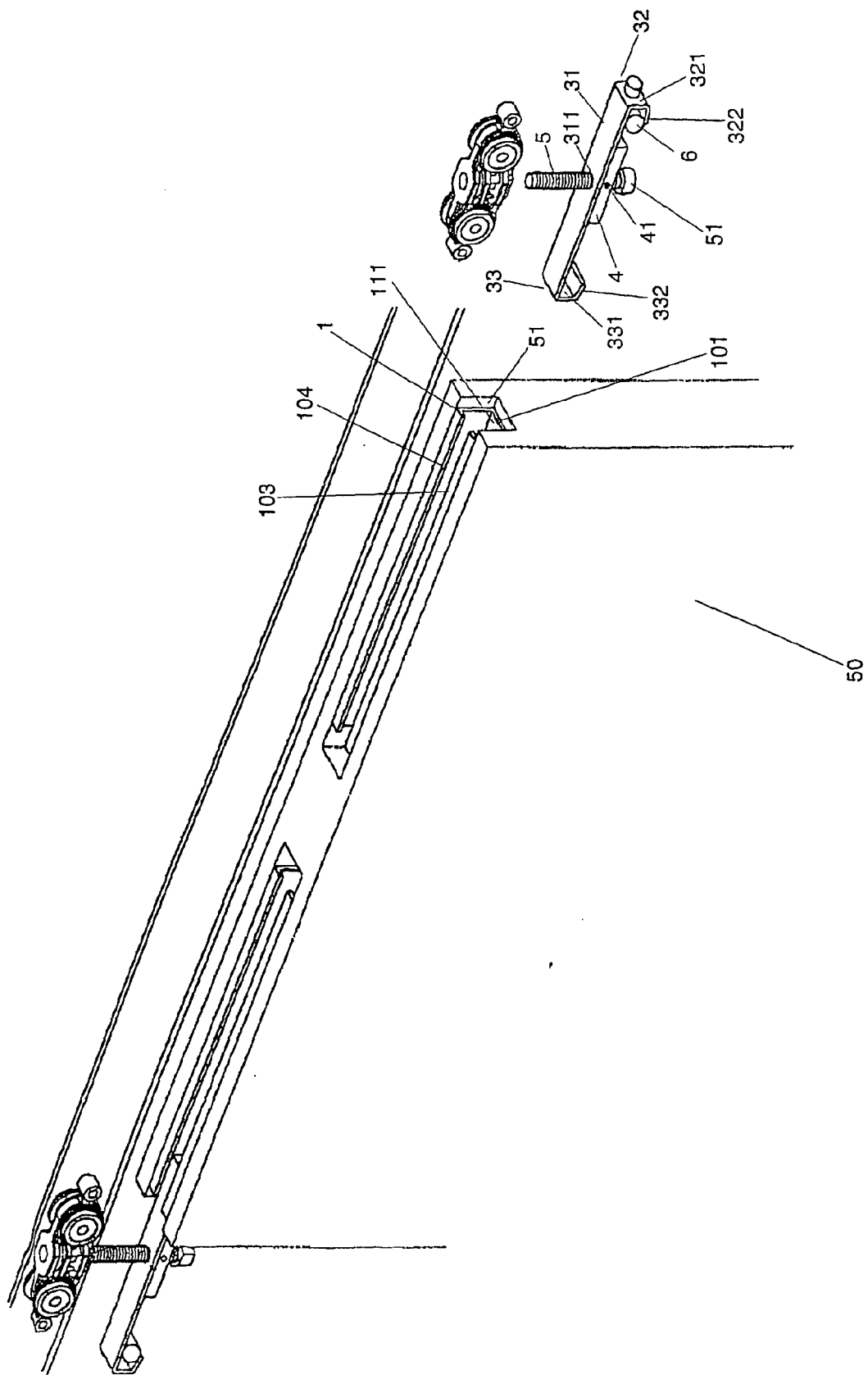


Fig. 7

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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