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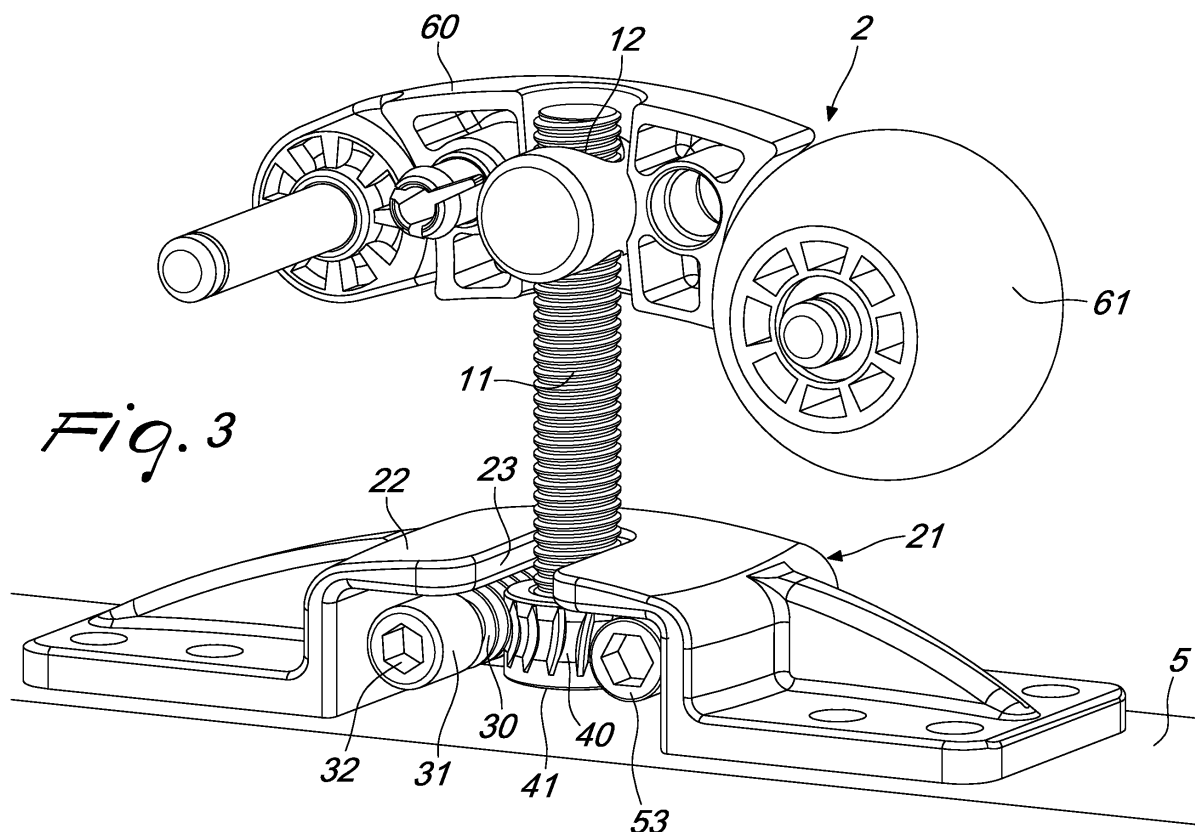
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(54) **Support particularly for doors, sliding door wings and the like**

(57) A support (1) particularly for doors, sliding door wings and the like comprising a carriage element (2) which is connected, by way of height adjustment means (10), to a sliding door (8), the height adjustment means (10) comprising a threaded element (11) that can engage

rotatably a threaded seat (12) provided in the carriage (2), means (30, 40) being further provided for actuating the threaded element (11), which means can be activated in a direction that is perpendicular to the plane of arrangement of the sliding door (5).



Description

[0001] The present invention relates to a support particularly for doors, sliding door wings and the like.

[0002] As is known, in the production of doors, sliding door wings and the like, typically the door, sliding door wing and the like is connected to the sliding carriages, which move in upper fixed guides by means of threaded pins that allow precise positioning of the door, sliding door wing and the like, adjusting its height.

[0003] In the solutions of the background art, in order to perform positioning one operates by means of Allen keys both on the screw and on the locking nut, thus having to provide an actuation by successive extents and having to perform, once correct positioning has been achieved, locking by tightening the locking nut.

[0004] In this type of intervention, the installation technician must be positioned so that his eyes are substantially at the height at which the screws to be adjusted are located; moreover, the operation is relatively slow, since it must be achieved completely by hand and by repositioning the key several times.

[0005] The aim of the invention is to eliminate the drawbacks noted above by providing a support particularly for doors, sliding door wings and the like that makes it possible to achieve adjustment continuously, without having to resort to the use of two Allen keys.

[0006] Within this aim, an object of the invention is to provide a device in which it is possible to perform adjustment with an extremely reduced effort, while having the assurance of automatic locking of the position once adjustment has been performed.

[0007] Another object of the present invention is to provide a support that allows the operator to perform work by using only one hand, with the possibility of having greatly reduced intervention times.

[0008] Another object of the present invention is to provide a support which, thanks to its particular constructive characteristics, is capable of ensuring highest reliability and safety of use.

[0009] Another object of the present invention is to provide a support that can be obtained easily starting from commonly commercially available elements and materials and is also competitive from a merely economical point of view.

[0010] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a support particularly for doors, sliding door wings and the like, according to the invention, comprising a carriage element which is connected, by way of height adjustment means, to a sliding door, **characterized in that** said height adjustment means comprise an element that can rotatably engage a threaded seat provided in said carriage, means for actuating said threaded element being further provided which can be activated along a direction that is substantially perpendicular to the plane of arrangement of said sliding door.

[0011] Further characteristics and advantages of the

invention will become better apparent from the description of a preferred but not exclusive embodiment of the support particularly for sliding doors and the like, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of a sliding door with the support according to the invention applied thereto;

Figure 2 is a perspective view, taken from the lower side, of the support according to the invention;

Figure 3 is a perspective view of the support with the block for the adjustment means removed;

Figure 4 is a sectional view, taken along the line IV-IV of Figure 2;

Figure 5 is a sectional view, taken along the line V-V of Figure 2;

Figure 6 is a sectional view, taken along the line VI-VI of Figure 2.

[0012] With reference to the figures, the support, particularly for sliding doors and the like, generally designated by the reference numeral 1, comprises a carriage, designated by the reference numeral 2, which can slide, as will become better apparent hereinafter, in fixed guides 3 provided for a sliding door, generally designated by the reference numeral 5.

[0013] The door 5 is connected to the carriage 2 by way of height adjustment means 10.

[0014] The height adjustment means comprise a threaded element 11, which rotatably engages a threaded seat 12 provided on the carriage 2.

[0015] The threaded element 11 is connected, by means of a supporting block 20, to a bracket 21 which is fixed to the upper edge of the door.

[0016] As shown more clearly in Figure 3, means for actuating the threaded element are provided which can be activated along a direction that is substantially perpendicular to the plane of arrangement of the door, sliding door wing and the like 5 for adjustment of the height position of the door.

[0017] The actuation means comprise a worm screw 30 with a worm screw head 31 that can be accessed frontally with respect to the door and has an actuation socket 32 which can be constituted by a hexagonal, cross-shaped or slotted socket for the screwdriver, or having any other shape adapted for engagement with a tool. The worm screw 30 engages a helical gear 40 provided on a head 41 of the threaded element 11 that is supported rotatably by the block 20.

[0018] With this arrangement, operation on the worm screw 30 causes the rotation of the helical gear 40 and consequently the rotation of the threaded element 11, which, by rotating with respect to the threaded seat 12, varies its height.

[0019] The actuation can occur continuously, for example by means of a power screwdriver or by means of a manual tool, which engage in the socket 32 of the head

31.

[0020] In order to mate the block 20 with the bracket 21, such block defines an inclined plane 50 with which a wedge-like element 51 engages which defines a threaded locking seat 52 in which a locking screw 53 rotatably supported by the block 20 engages.

[0021] By operating on the locking screw 53, the translational motion of the wedge 51 is provided and consequently interlocking is provided with the transverse walls of a bridge 22 formed by the bracket element 21, achieving precise fastening with respect to such bracket element, with the possibility of varying the position with respect to a direction that is perpendicular to the plane of arrangement of the sliding door thanks to the fact that the threaded element is contained in a slot 23 defined by the bridge 22, so that it is possible to correctly position the threaded element 11 with respect to the door, sliding door wing and the like.

[0022] The carriage 2 has a double fork-like body 60, which supports substantially spherical wheels 61 engaging in the fixed guides 3, which have a cradle-like transverse cross-section.

[0023] This shape allows the carriages to self-center and to work perfectly with full resting contact of the two wheels in any situation, even in case of misalignment of the plumb line of the complementary frame or of the guide.

[0024] From what has been described above it is evident that the invention achieves the proposed aim and objects, and in particular the fact is stressed that it is possible to adjust the height of a sliding door with a manual or electrically powered tool by an operator who uses only one hand with extremely reduced effort, since the mating between the worm screw and the helical gear is in practice a reduction gear, so that the rotation of the worm screw has a ratio that reduces the effort for lifting the weight of the door, which sometimes, being made of crystal, is considerable.

[0025] Moreover, the mating between the worm screw and the helical wheel is a mating of the irreversible type, since movement can be transmitted from the worm screw to the helical gear but not vice versa, i.e., the helical gear cannot transmit movement to the worm screw, so that once adjustment has been performed the locking is definite without the need of further intervention.

[0026] Another advantage of the invention further consists in that the installation technician does not necessarily have to place himself with his eyes at the height of the screws, as occurs in traditional systems, but can simply perform the adjustment operations by lifting his arm to the height of the mechanism and by using only one hand, since the device can be reached perfectly without any effort.

[0027] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0028] The details may further be changed according to requirements.

[0029] In practice, the materials used, as long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to requirements.

[0030] The disclosures in Italian Patent Application No. MI2009A000574 from which this application claims priority are incorporated herein by reference.

[0031] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A support particularly for doors, sliding door wings and the like, comprising a carriage element (2) which is connected, by way of height adjustment means (10), to a sliding door (5), **characterized in that** said height adjustment means (10) comprise a threaded element (11) that can rotatably engage a threaded seat (12) provided in said carriage (2), means (30, 40) for actuating said threaded element (11) being further provided which can be activated along a direction that is substantially perpendicular to the plane of arrangement of said sliding door (5).
2. The support according to claim 1, **characterized in that** said actuation means comprise a worm screw (30), which can be accessed frontally with respect to said sliding door (5), said worm screw (30) engaging a helical gear (40) that is jointly associated with said threaded element (11).
3. The support according to claim 2, **characterized in that** it comprises a supporting block (20), which is associated with said sliding door (5) and rotatably supports said worm screw (30).
4. The support according to one or more of the preceding claims, **characterized in that** said worm screw (30) has a head (31) with an actuation socket (32) that can be accessed frontally with respect to said sliding door (5).
5. The support according to one or more of the preceding claims, **characterized in that** said actuation means (30, 40) are of the irreversible type.
6. The support according to one or more of the preceding claims, **characterized in that** said block (20) defines an inclined plane (50) that can be engaged by a wedge-like element (51) that defines a threaded locking seat (52) in which a locking screw (53) engages which is supported rotatably by said block

(20), said block (20) and said wedge-like element (51) being actuatable for their joint connection to the inside of the bracket (21) that is fixed to said door.

7. The support according to one or more of the preceding claims, **characterized in that** said bracket (21) has a transverse recess (23) that is provided on the bridge (22) and through which said threaded element (11) passes for positioning said block (20) along a direction that is perpendicular to the plane of arrangement of said door (5). 5 10
8. The support according to one or more of the preceding claims, **characterized in that** said carriage (2) has a double fork-like body (60), which supports spherical wheels (61) that can slide in fixed guides (3) for said door, said sliding door wing and the like (5), said guides having a cradle-like cross-section. 15

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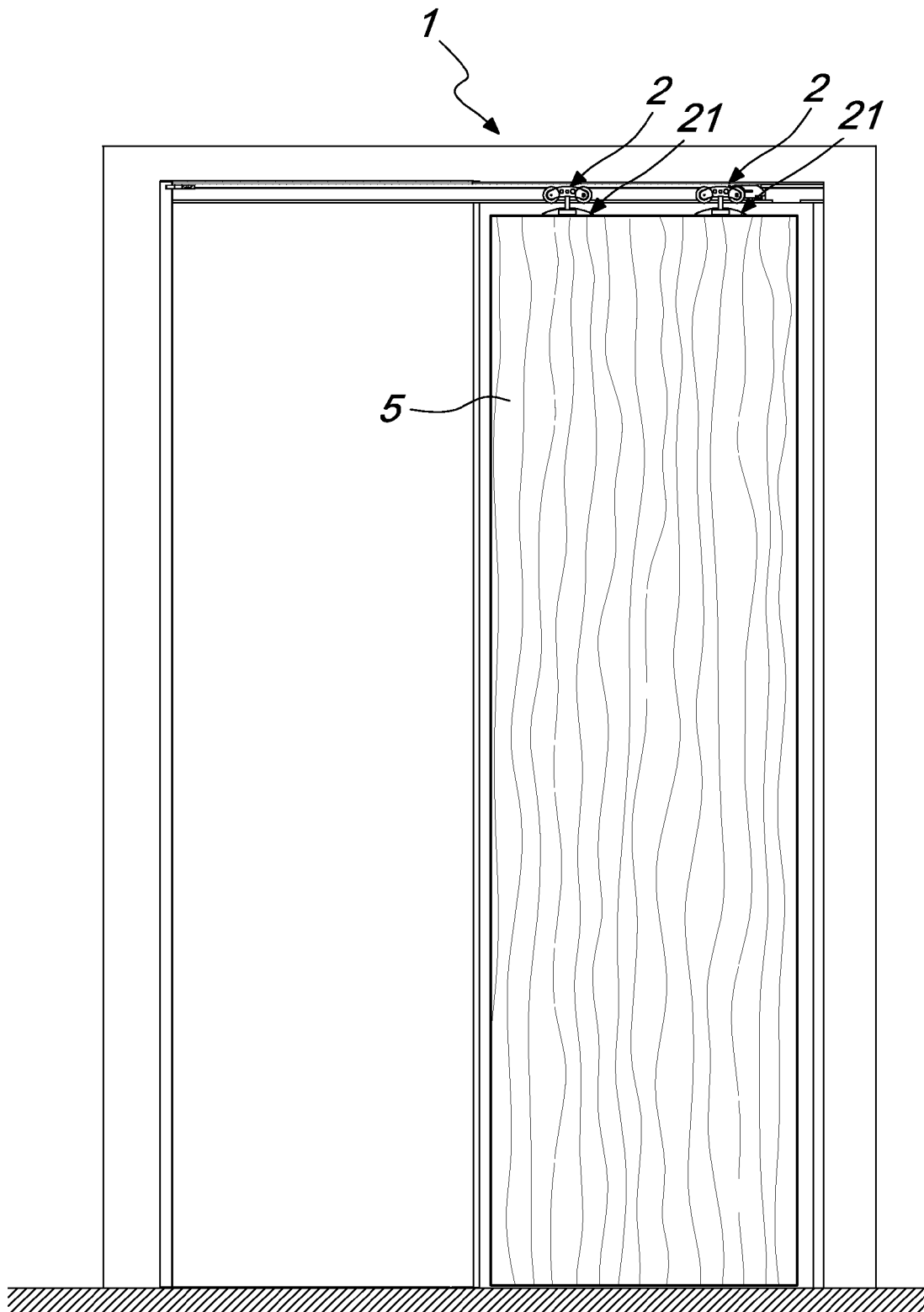


Fig. 1

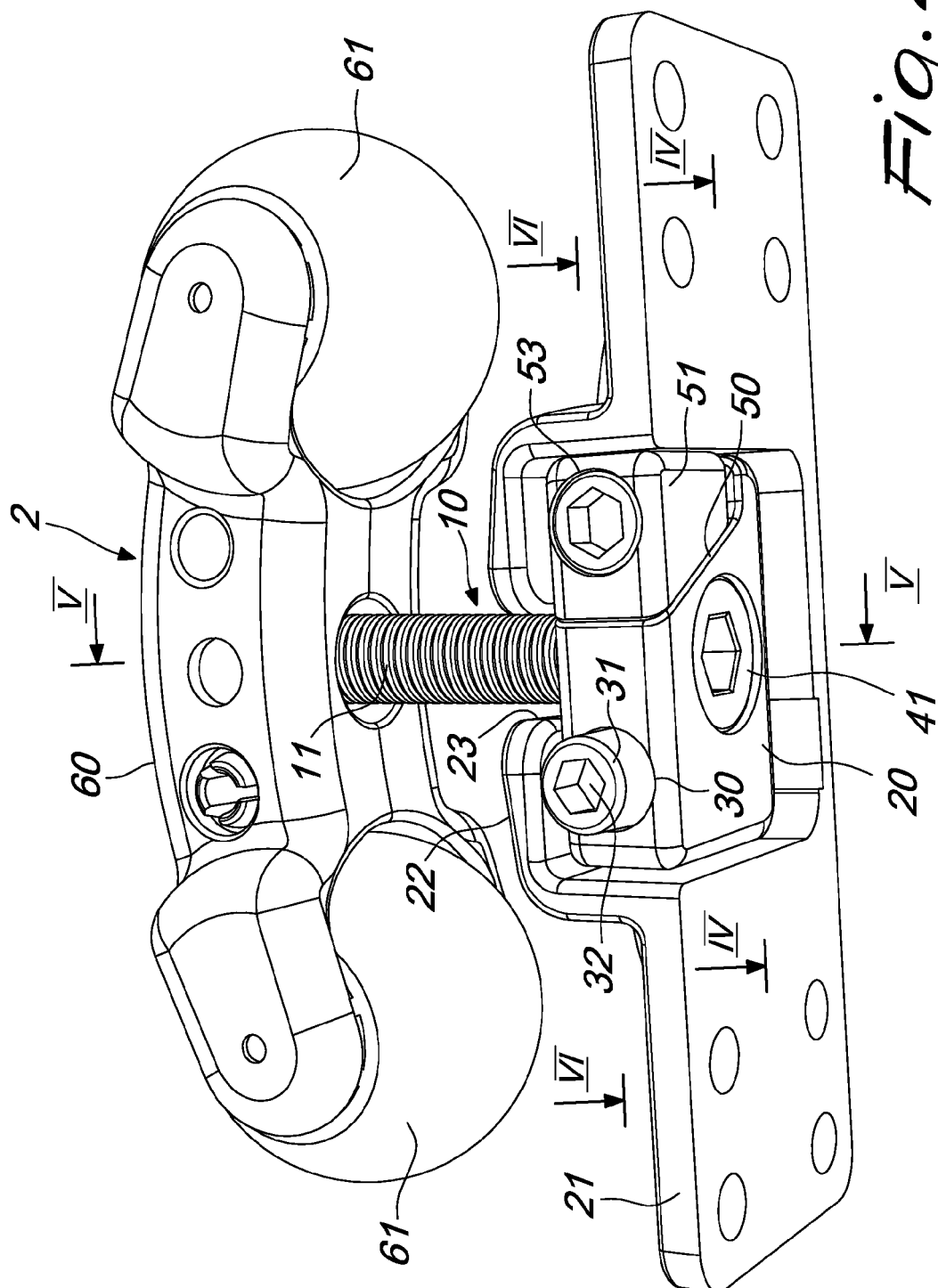
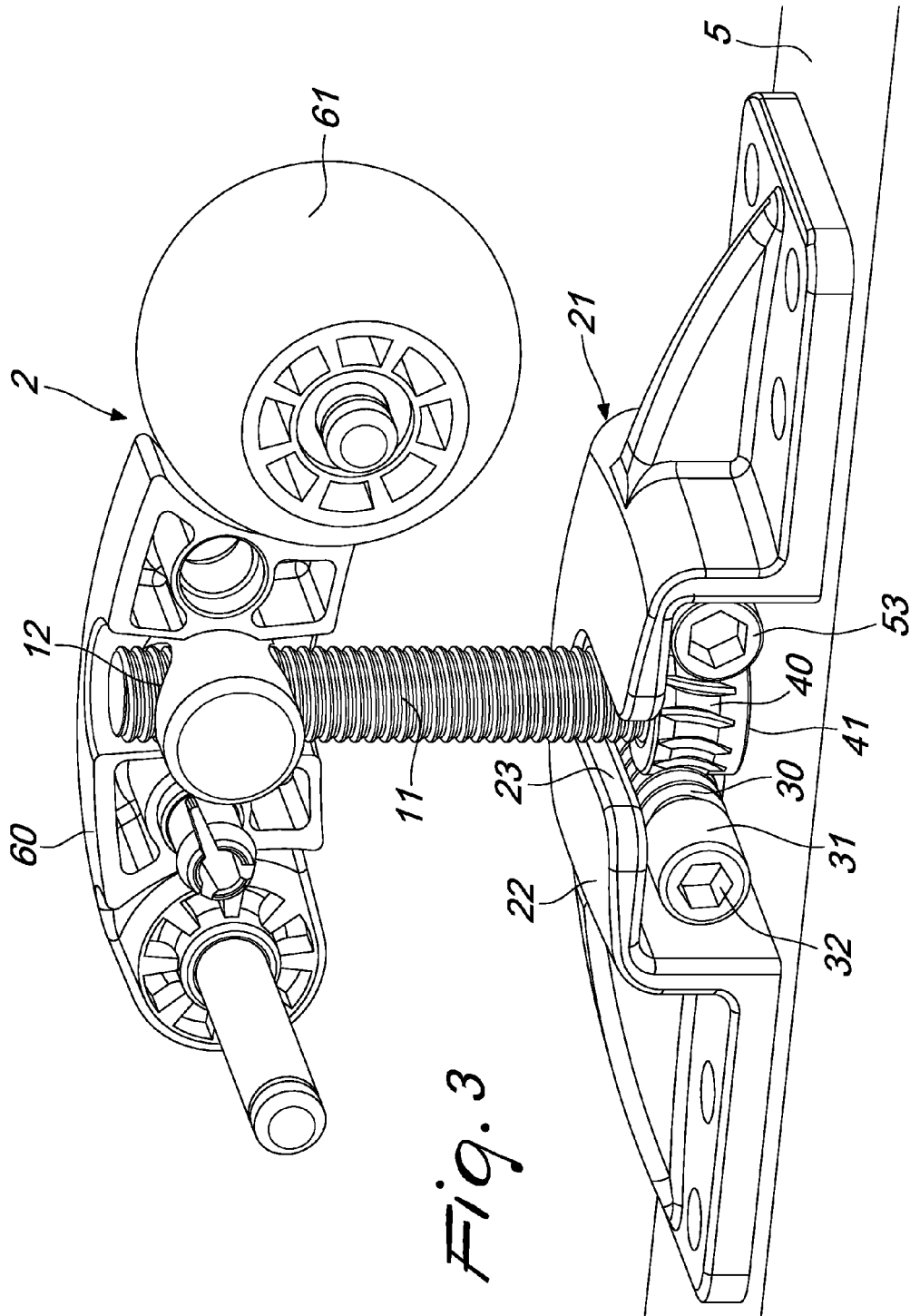
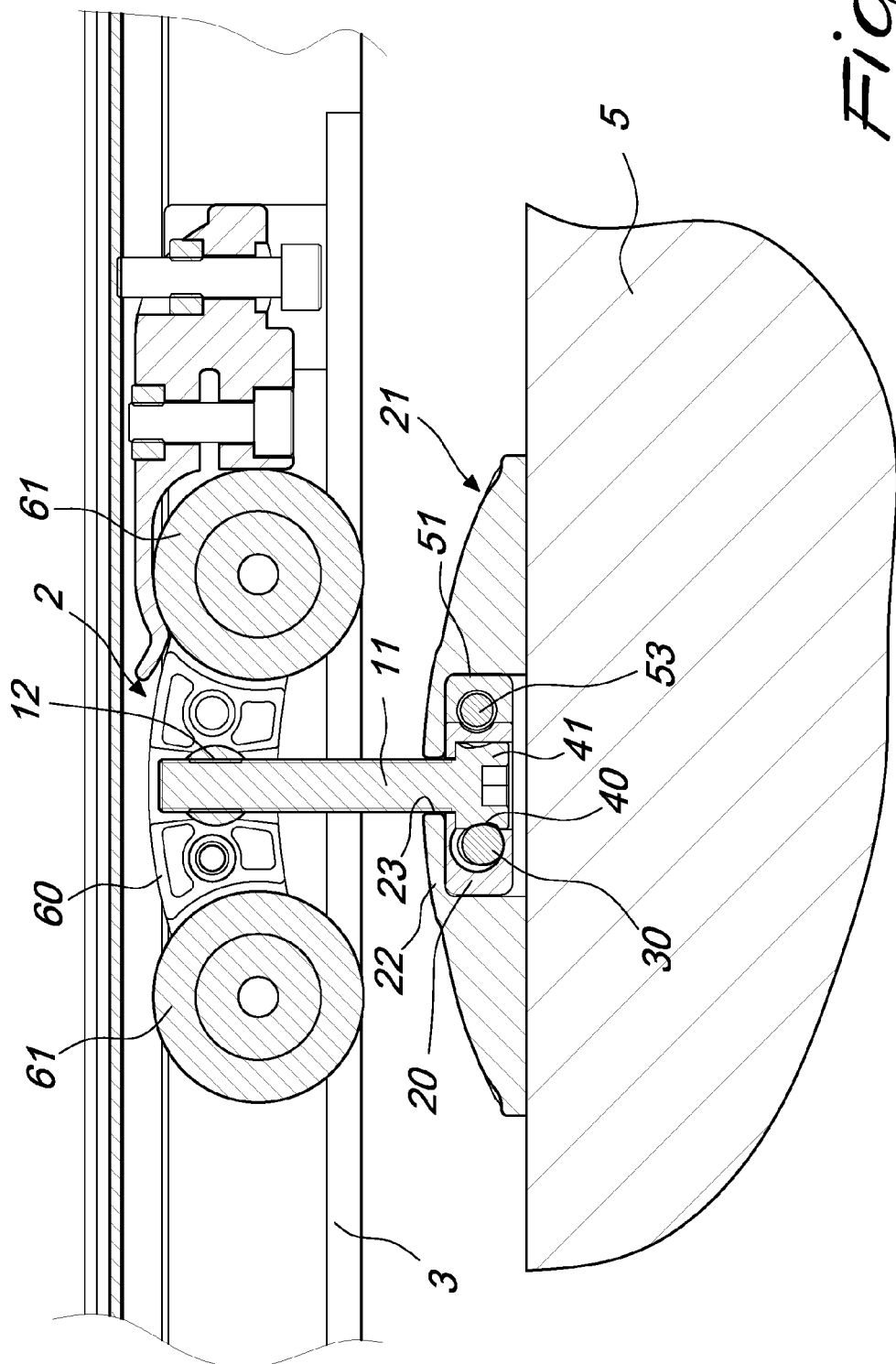


Fig. 2





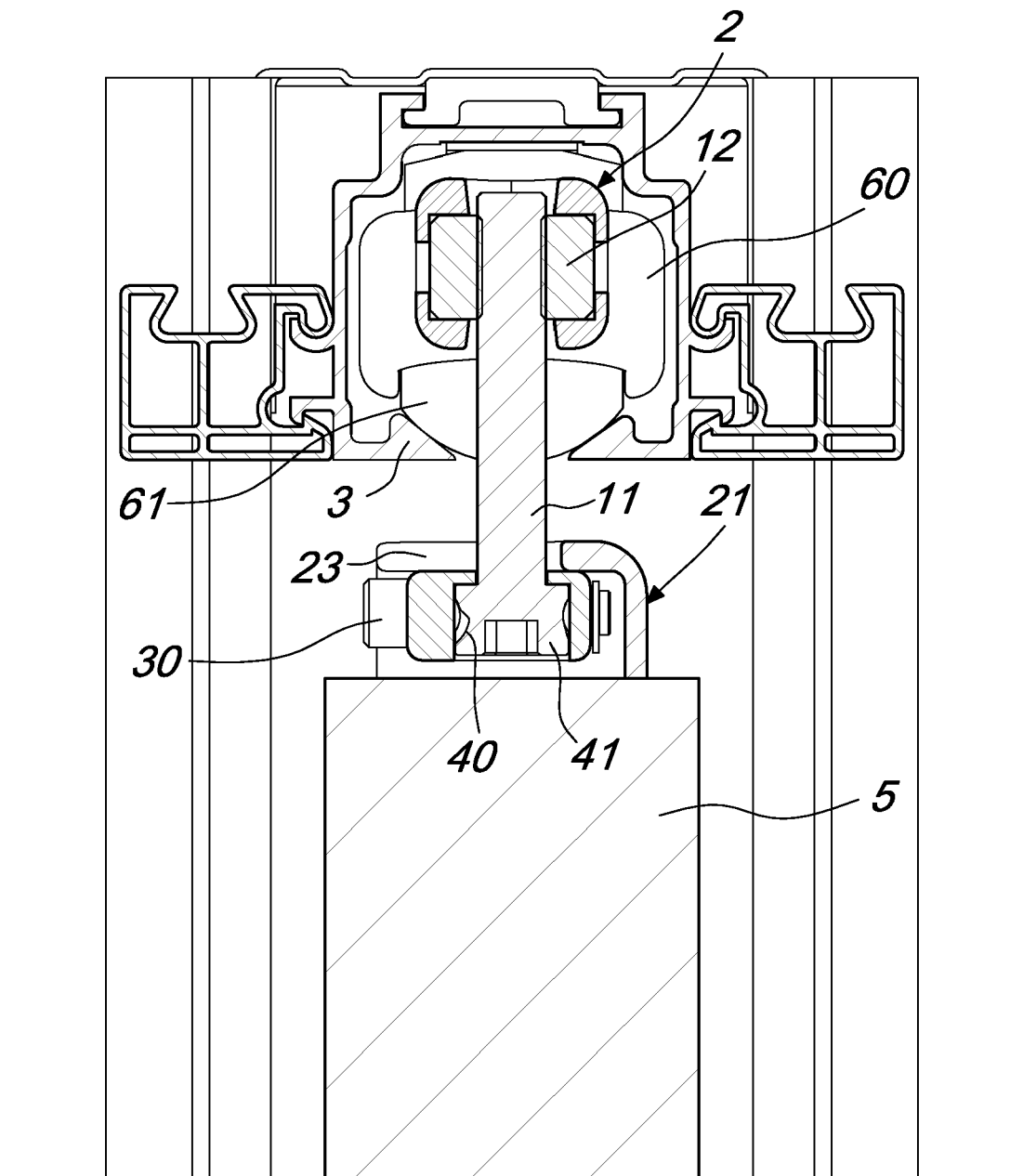


Fig. 5

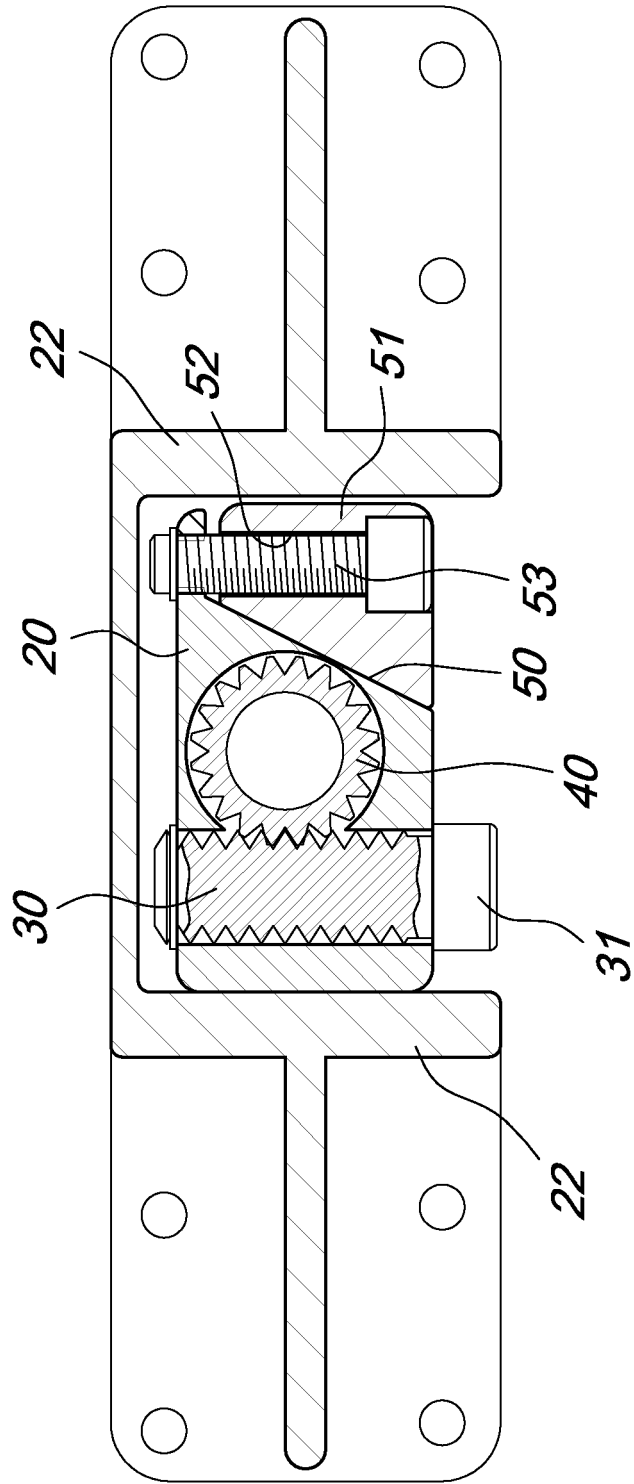


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 7095

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 598 356 C (DOWALDWERKE ADOLPH DOWALD G M) 9 June 1934 (1934-06-09)	1-5	INV. E05D15/06
A	* page 2; claim 1; figures 1,2 *	6-8	
A	EP 0 417 000 A1 (AZOULAY BENJAMIN [FR]) 13 March 1991 (1991-03-13) * column 5, line 7 - column 8, line 9; claim 1; figures 1-5 *	1-8	
A	DE 28 19 335 A1 (VER BAUBESCHLAG GRETSCH CO) 8 November 1979 (1979-11-08) * page 10 - page 11; claim 1; figures 1-5 *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 May 2010	Examiner Balice, Marco
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 15 7095

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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26-05-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 598356	C	09-06-1934	NONE
EP 0417000	A1	13-03-1991	FR 2651530 A1 08-03-1991
DE 2819335	A1	08-11-1979	NONE

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT MI20090574 A [0030]