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(71) Applicant: **Sisco Sistem Line Srl**
20816 Ceriano Laghetto, MB (IT)

(72) Inventor: **Riganti, Paolo**
20816 Ceriano Laghetto (IT)

(74) Representative: **Longoni, Alessandra**
AL & Partners Srl
Via C. Colombo ang. Via Appiani
(Corte del Cotone)
20831 Seregno (MB) (IT)

(54) **SLIDING DOOR DEVICE, SLIDING DOOR AND MANUFACTURING METHOD THEREOF**

(57) A sliding door device (14) comprising a frame element (19) securable to a vertical wall (15) and a guide and/or support component comprising at least one idle wheel configured to drive and/or support by way of a guide and/or support profile (21) a door (11) when sliding. The device (14) also comprises an anti-jamming component associated with the support component and configured to be moved and adjusted in vertical direction as to the frame element (19) at the same time as the support component so that the at least one idle wheel is brought into contact with the guide and/or support profile (21) and the anti-jamming component is brought into engagement with the profile (21). The invention also relates to a sliding door and a method of making the same sliding door.

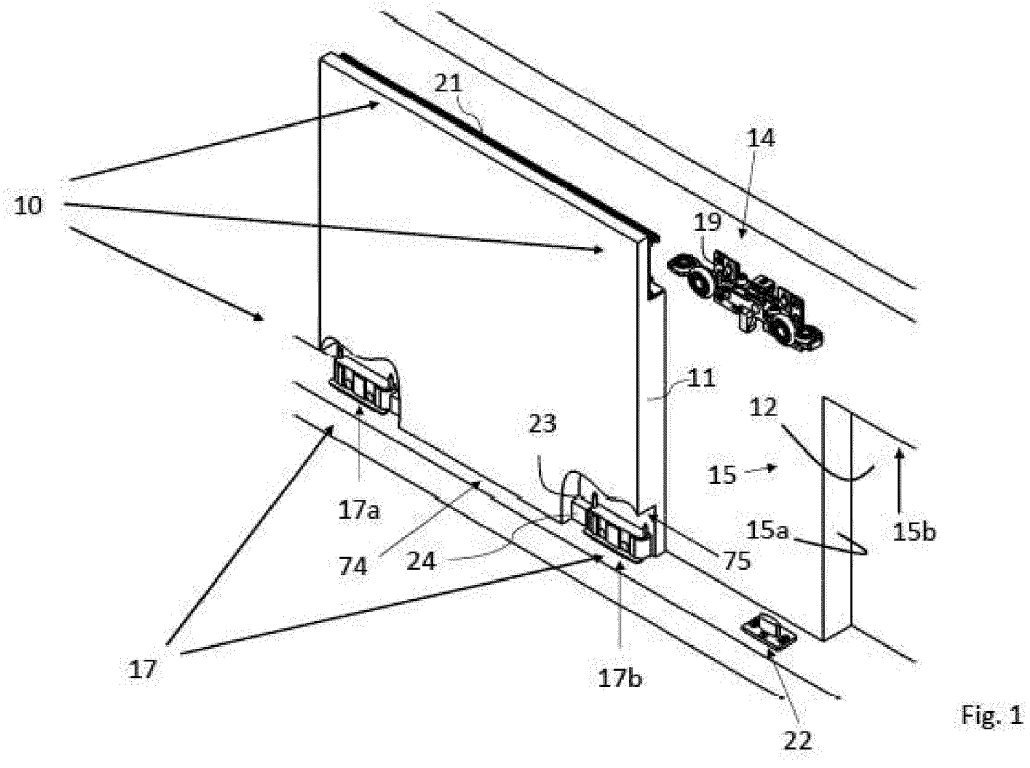

Fig. 1

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Description

Technical Field

[0001] Present invention relates, in general, to a sliding door in which a door is adapted to assume any position between extreme opening and closing positions of a door opening in a wall.

[0002] In particular, the present invention relates to a sliding door comprising a device fixed to the wall and arranged to guide and support by way of idle wheels the door in its sliding between the extreme positions.

Background Art

[0003] Sliding doors are known in which a door is made to run on a device fixed to a vertical wall.

[0004] For example, patent document WO2012073215_A discloses a sliding door comprising both means for guiding and supporting the door, fixed to a vertical wall, and sliding means secured to lower ends of the door.

The known guide and support means comprises idle rotating organs fixed to the vertical wall.

Each known sliding means comprises a wheel respectively located at one of the lower ends of the door, and is suitable to slide freely so as to allow the sliding of the door on the floor.

[0005] A first problem with the sliding doors of the known type is that, since the door is suspended on idle wheels fixed to a vertical wall, a real risk exists that the door may disengage from the idle wheels if, in use, the door is run with violence between the extreme positions.

[0006] A second problem of the sliding doors of known type, associated to the first one, is that any doorstop fixed to the door can contribute to facilitate the release of the door from the idle wheels if, in use, the door bangs with violence against end limits.

[0007] A third problem of the sliding doors of known type, associated to the first two, is that known sliding means provided at the lower ends of the door can be extremely sensitive to any irregularity on the floor and can therefore contribute once again to facilitate the release of the door from the idle wheels.

[0008] Applicant, in general, has noted that known art seems not able to effectively solve the problems listed above of the sliding doors whereby there is a need for new devices to be applied to the sliding doors to solve such problems.

Disclosure of the Invention

[0009] The object of the present invention is thus to solve the problems outlined above of the known art.

[0010] Such an object is achieved by way of a sliding door comprising the features set forth in the claims that follow.

[0011] The present invention also relates to a method for manufacturing a sliding door.

[0012] Claims are an integral part of the teaching of the present invention.

[0013] The following summary of the invention is provided in order to provide a basic understanding of some aspects and features of the invention.

This summary is not an extensive overview of the invention, and as such it is not intended to particularly identify key or critical elements of the invention, or to delineate the scope of the invention. Its sole purpose is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented below.

[0014] According to a feature of a preferred embodiment, the sliding door comprises a profile fixed to a door and a support device comprising a frame part fixable to a vertical wall, a support component comprising at least one idle wheel and an anti-releasing component associated to the support component and capable of engaging the profile when the at least one idle wheel is brought into contact with the profile by moving the support component with respect to the frame part.

[0015] According to a further feature of the present invention, the support device further comprises a pivotable component associated to the support component and configured to handle and lock on a horizontal surface the at least one idle wheel with a certain angle as regards the vertical wall.

[0016] According to another feature of the present invention, the sliding door further comprises a sliding device comprising at least one carriage for sliding on a horizontal plane or on the floor and comprising a first and a second idle wheels adjacent each other and covered by way of polyurethane covers.

Brief Description of Drawings

[0017] These and further features and advantages of the present invention will appear more clearly from the following detailed description of preferred embodiments, provided by way of non-limiting examples with reference to the attached drawings, in which components designated by same or similar reference numerals indicate components having same or similar functionality and construction and wherein:

Fig. 1 shows an overall view of a sliding door;

Fig. 2 shows an axonometric view of a first device provided in the sliding door of Fig. 1 according to one of the embodiments thereof;

Fig. 3a, 3b, 3c show some views of a component provided in the device of Fig. 2;

Fig. 4 shows a view at different working positions of a further component provided in the device of Fig. 2 and according to one of the embodiments thereof;

Fig. 5a, 5b show views of a second device provided in the door of Fig. 1 according to one of the embodiments; and

Fig. 6 shows an axonometric view of a third device provided in the door of Fig. 1 according to one of the embodiments thereof.

Best Modes for Carrying Out the Invention

[0018] With reference to Fig. 1, a sliding door 10 according to a preferred embodiment comprises a door 11 which is adapted to freely move within extreme positions so as to open and close a door opening 12 such as a real or dummy door opening, a first device (guide and/or support device) 14 comprising a frame element 19 fixed to a stationary vertical wall 15, laterally to a lateral edge 15a and above a top edge 15b of the door opening 12, and at least one sliding device 17 comprising, for example, a pair of carriages, 17a and 17b, which slide on a horizontal plane, for example on a floor, and are fixed to a lower surface 74 of the door 11, preferably at opposite ends of such door 11.

[0019] According to an even more preferred embodiment, the sliding door 10 further comprises shock absorbing devices 18a and 18b (Fig. 1, Figs. 5a-5b) of a predetermined width "L" and fixed to the door 11 in an upper door area and arranged to damp, in use, the door when reaching its end limits.

[0020] According to all embodiments, the door 11 also comprises a guide and/or support profile or top profile 21 configured to cooperate with the first device 14 and preferably secured to a milling 84 made on one side 86 of two main sides 86 of the door 11 in a distal position from the lower surface 74 of the door 11, and an alignment part 23, for example a milling made on the lower surface 74 of the door.

According to other embodiments, the top profile 21 is directly secured to one main side 86 of the door 11.

[0021] As will be disclosed later on in detail with respect to the operation of the sliding door, the top profile 21 is provided to allow the door 11 to slide on the first device 14 and, for example, the alignment part or milling 23 is provided for cooperating with a guide component 22 fixed to the horizontal plane or floor, so as to keep the door 11 parallel to the wall 15.

[0022] In the present description, terms like vertical and horizontal, upper and lower are used to indicate elements or parts having orientation and position as conventionally defined in common use, so that, in the present description such terms are to be interpreted in the way conventionally provided according to the common use.

[0023] The first device or guide device 14, moreover, preferably comprises a plurality of components provided to allow, in use, a plurality of respective functions both during installation and operation of the sliding door 10.

According to various embodiments, the components may all or only partially be present in the support device 14.

[0024] According to all embodiments, the guide device 14 comprises a support guide 42, arranged to be moved and adjusted in vertical direction with respect to the frame element 19, and a first component 40 (Fig. 1 Figures 3a-3c) preferably comprising at least one first and one second idle wheel, 401 and 402, placed with a rotation axis orthogonal or substantially orthogonal to the surface of the vertical wall and spaced apart at a predetermined distance, for example comprised between 100 and 200 mm.

[0025] According to a first different embodiment, the first component 40 may comprise a single wheel, 401 or 402, without thereby departing from the scope of what is disclosed and claimed.

[0026] According to a second different embodiment, the first component (guide and/or support component) 40 comprises a third and/or fourth idle wheel, 403 and 404, preferably arranged adjacent but distal and opposite to the first and/or to the second idle wheel, 401 and 402, respectively, and oriented with a rotation axis parallel to the surface of the vertical wall 15.

[0027] The first component, in particular its first and second idle wheels, 401 and 402, are arranged to guide and/or support the door 11 and to slide along the top profile 21 over an upper inner surface 25 of the top profile 21.

The third and fourth idle wheels, 403 and 404, if present, are configured to lean on a lateral surface of the profile 21 and preferably are arranged to provide an additional guide and/or clearance reducer between the top profile 21 and the guide device 14.

[0028] According to the preferred embodiment, the first component 40 is configured so that it can be adjusted in a vertical direction and locked by way of an adjustment element 41, for example a regulation screw, so as to enable, in use, first and second idle wheels, 401 and 402, to arrive in contact to the upper inner surface 25 of the profile 21.

In particular, the first component 40 is fixed to the support guide 42 and is operable so as to be moved and adjusted in vertical direction, by way of the regulation screw 41, with respect to the frame element 19 fixable to the vertical wall 15 and to be brought into contact with the upper inner surface 25 of the profile 21.

In other words, the adjustment element 41 by moving the at least one idle wheel 401 or 402 or the first and second idle wheels, 401 and 402, aligned each other in a predetermined manner, is configured so as to allow the first component 40 to be brought into contact with the upper inner surface 25 of the profile 21, while at the same time providing a predetermined alignment of the door 11 with respect to the wall 15.

[0029] According to one of the various embodiments, the first device 14 comprises a second component 50 fastened to the support guide 42 of the first component 40 and configured to allow, in use, an automatic secure attachment of the door 11 to the first device 14.

In particular, the second component (clamping or anti-jamming component) 50, preferably associated to the guide and/or support component 40, comprises a shell 52 and a lever 51, such as a snap lever resiliently loaded by a resilient element 54, for example a helical spring.

More particularly, the lever 51 comprises first and second ends, 55a and 55b respectively, configured to removably engage, alternatively, externally or internally, the shell 52 and third ends (sealing ends) 56 configured to engage and mechanically hold a contour 27a, for instance a "L" contour, made on an upper external surface 26 of the top profile 21.

[0030] In use, the lever 51, when in a rest position, is retained within the shell 52 by way of the first ends 55a which are held hooked to a first corresponding protruding element 57a, comprised within to the shell 52.

During the installation of the sliding door 10, the lever 51 is released by the corresponding protruding element 57a and the second ends 55b, for example one or more protruding elements pushed by the spring 54, hook second corresponding protruding elements 57b comprised within the shell 52.

[0031] In this configuration useful for installing the door 11, the lever 51 protruding from shell 52 is arranged to contact an outer contour 27b of the top profile 21 until the first and second idle wheels, 401 and 402, are brought into contact with the upper inner surface 25 of the top profile 21 and, for example, at the same time, the sealing end 56 of the lever 51, pushed by the spring 54, goes off the outer contour 27b of the top profile 21 with a click, for example an audible sounding click, such to grant, to whom is installing the door 10, that the lever 51 is brought into engagement with the contour 27a, i.e. with the top profile 21, and, consequently, the door 11 is properly installed and secured.

As a matter of fact, as easily understandable by a technician in the field, the presence of the lever 51 within the contour 27a shaped by the upper external surface 26 of the top profile 21 prevents that the door 11 goes out of the guide 14, for instance, subsequent to any jerk of the door causing the first and/or the second idle wheels, 401 and 402, to move away from the upper inner surface 25 of top profile 21.

[0032] Preferably, the lever 51 is made of a plastic material, such as NYLON, so as to allow, in use, an easy hooking to and release from the shell 52.

[0033] In summary, the structure of the second component 50 or similar structures, being linked to the positioning, in use, of the first component 40, allow to hook the door 11 and, at the same time, to automatically secure it, by acting on an adjustment element 41 common to the guide and/or support component 40 and to the anti-jamming component 50.

In other words, the adjustment element 41 ensures that the guide and/or support component 40 is brought into contact with the top profile 21 and that, at the same time, the anti-jamming component 50 is automatically located so as to secure the top profile 21 and, consequently, the door 11.

[0034] According to a further embodiment among various embodiments, the first device 14 comprises a third component 60 (Fig. 1, Fig. 2, Fig. 3a-3c, Fig. 4), fixed to the support guide 42 of the guide and/or support component 40, and configured to allow, in use, to solve any parallelism problem in a predetermined range, for example within a range of $\pm$ 2°, between the sliding door 10 and the wall 15.

In particular, the third component or parallelism adjustment or tilting component 60 is associated to the first component 40 and is configured to allow the door 11 to slide parallel to the wall 15 even when the wall to which the guide device 14 is attached is not perfectly aligned with the door opening 12 but has a certain inclination or curvature.

[0035] Preferably, the tilting component 60 comprises first and second movement and locking elements, 61 and 62, for example respective screws adapted to be fastened to the support guide 42 and operating within a first and a second slot, 63 and 64, disposed on a horizontal surface of the support guide 42 and arranged to move the third component 60 with respect to the frame element 19.

[0036] According to the preferred embodiment, it is provided that the movement of the first element 61 in a certain direction on the horizontal surface involves the movement of the second element 62 in an opposite direction so as to maintain aligned the first and second idle wheels 401 and 402.

[0037] According to other embodiments of the tilting component 60, it is provided that the movement of the first element 61 is independent of the movement of the second element 62. Such an embodiment may be convenient in case of arc-shaped doors.

[0038] According to all embodiments, the first idle wheel 401 and, if present, the third idle wheel 403 are arranged to be moved and locked on a horizontal plane in a predetermined angular range with respect to the second idle wheel 402 and, if present, to the fourth idle wheel 404, by way of the first and second movement and locking elements, 61 and 62, respectively.

[0039] According to further different embodiments of the disclosed tilting component 60, the first movement and locking element 61 or, alternately, the second movement and locking element 62 may not be present or only one movement and locking element, 61 or 62, may be present for controlling the tilting, for example in opposite directions, of both the wheels 401 and 402 with respect to the frame element 19 and therefore with respect to the stationary wall 15.

[0040] In summary, the third component or tilting component 60 according to the disclosed embodiment or other similar embodiments, if present, allows to move and lock by way of at least one movement and locking element, 61 or 62, on the horizontal plane at least the first and/or the second idle wheel, 401 or 402, of the first component 40.

[0041] The shock absorbing devices, 18a and 18b, (Fig. 1, Figs. 5a-5b) are provided, in accordance with one of the various embodiments, in the top area of the door 11, preferably at opposite ends of the top profile 21, and are arranged to absorb and block the movement of the

door at the extreme opening and closing positions of the door opening 12.

[0042] Preferably, the shock absorbing devices, 18a and 18b, are identical to each other and are located in a specular position with respect to a plane orthogonal to the top profile 21. In the following, one of the two devices is disclosed, in particular the device 18a, and the numerical references are identical for both devices 18a and 18b. Of course, according to other embodiments, the shock absorbing devices may not be identical to each other.

[0043] The shock absorbing device 18a comprises shock absorbers or dampers 83 of known type, for instance a spring associated to a shock absorber, and a locking element 85 of known type that are arranged to absorb and block the sliding of the door 11 with respect to the support device 14 at the extreme positions.

[0044] Preferably, the shock absorbing device 18a further comprises an idle wheel 82 with a diameter larger than the predetermined width "L" of the device and with a rotation axis parallel to the vertical wall 15.

[0045] The idle wheel 82 is fixed to the shock absorbing device and positioned, in use, at or near the end of the top profile 21.

In particular, the idle wheel 82 is shaped so as to protrude few millimeters, for example 5-30 mm, from the side 86 of the door 11.

[0046] According to other embodiments it is enough that the idle wheel 82 protrudes few millimeters, for example 5-20 mm, from the shock absorbing device.

[0047] In all cases, the idle wheel 82, as experimentally verified by the Applicant, is arranged to operate as a wall-saver in case of oscillations of the door when sliding between the extreme opening and closing positions of the door opening 12.

[0048] The carriages 17a or 17b (Fig. 1, Fig. 6) comprised in the sliding device 17 are, for example, fixed to the opposite ends of the door 11 on a lower surface 74, and, according to the preferred embodiment, respectively comprise, one or more shells (wheel shells) 71, such as a shell each, and at least a first 72a and second idle wheel 72b, comprised within each carriage, 17a or 17b, and down protruding by a predetermined distance, for example 5-10 mm, from the shells 71.

Preferably, carriages 17a and 17b are two identical carriages, so that same numerical references are used in the following description for each carriage.

Of course, according to other embodiments, carriages may not be identical to each other as well as the carriages may be one or more than two, depending on various constructive requirements of the sliding door 10.

[0049] According to the preferred embodiment, the wheel shells 71 comprised in each carriage, 17a or 17b, are inserted into respective housings 75 formed on the lower surface 74 of the door 11, at opposite ends of the same door 11, and are secured thereto in a known manner, for example by self-tapping screws.

Preferably to each shell 71 a pair of idle wheels, 72a and 72b, is secured, but according to other embodiments it is provided that a single wheel is secured to each shell with the constraint that carriages, 17a or 17b, comprise at least a first and a second wheel adjacent to each other, 72a and 72b.

[0050] The wheels, 72a and 72b, according to the preferred embodiment are identical, are pivoted in a known manner, for example one by one or all together to a shell 71. The wheels preferably have diameters comprised between 20-40 mm and comprise respective bearings 73a and 73b, for instance ball bearings, coated with respective coatings, 76a and 76b, for example made of polyurethane.

In particular, in accordance with the still more preferred embodiment, the bearings, 73a and 73b, are coated with coatings, 76a and 76b, respectively made of casting polyurethane, for example casting polyurethane type PU-EH 92 SH made by TECNOGOMMA Company.

More particularly and preferably, the coatings 76a and 76b of the bearings 73a and 73b have a thickness "SP" comprised between 3-10 mm and a width "LP", shaped to contact the floor, comprised between 5-15 mm.

[0051] Applicant has experimentally noted that the sliding device 17 comprising at least two carriages 17a and 17b and at least two wheels 72a and 72b for each carriage has a lot of advantages over sliding devices or carriages known in the art.

As a matter of fact, the sliding device 17 does not require elastically deformable springs or levers, and thanks to the configurations described it is also capable of reducing or even eliminating jerking of the door 11 when it slides between the extreme opening and closing positions of the door opening 12, in particular, next to possible spaces between tiles or to floor irregularities.

[0052] According to different embodiments considered less advisable, the wheels 72a and 72b may also be different from each other as regards, for example, the bearings 73a and 73b, the thickness "SP" and/or the width "LP" of the respective coatings, 76a and 76b, without thereby departing from the scope of what is disclosed and claimed.

[0053] Manufacturing and assembly of the sliding door 10 described herein comprises some manufacturing steps, prior to the assembly, and some real assembly steps.

[0054] The manufacturing steps or assembly preparation steps comprise the following steps even in a different sequence or grouped together:

A first optional step in which the shock absorbing devices 18a and 18b are inserted into the top profile 21 and secured thereto, in known way, at predetermined positions.

A second step in which the top profile 21, optionally completed with the shock absorbing devices 18a and 18b, is secured to the milling 84 or, even, to the side 86 of the door 11 in a predetermined position, for example by way of self-tapping screws.

A third step in which the carriages 17a and 17b are

preferably inserted into the respective housings 75 shaped on the lower surface 74 of the door 11 and secured, for example by way of self-tapping screws, to the housings 75 and therefore to the door 11.
A fourth optional step, in which a lower profile 24 is inserted in the milling 23 and secured thereto 23.
A fifth step in which the guide and/or support device 14 is fixed to the wall 15, for example by means of known type plugs, at a predetermined position, facing the door opening 12 and preferably laterally and above the door opening 12.
A sixth step in which the guide component 22 is fixed to the floor, for example by means of known type plugs, preferably in a position facing the same side 15a to which the first device 14 is facing.

[0055] The real assembly steps or manufacturing completion steps of the sliding door 10 comprise the following steps even in a different sequence or grouped together:

A first step in which the door 11 is inserted by way of the milling 23 or the lower profile 24 in the guide component 22.
A second step in which the door 11 is positioned vertically so that the top profile 21 leans against the guide and/or support device 14.
A third step in which the lever 51 of the anti-jamming component 50 is released, for example manually, from the rest position so as to protrude from the shell 52 and to contact the outer contour 27b of the top profile 21.
A fourth step in which the adjustment element 41 is actuated in such a way as to bring the guide and/or support component 40, for example the first and second idle wheels, 401 and 402, in contact with the upper inner surface 25 of the top profile 21, and the anti-jamming component in engagement with the top profile 21. The engagement step, preferably, provides an audible sound click due to the fact that it is provided that the lever 51 click shuts into the profile 27a of the upper external surface 26 of the top profile 21 and that at the same time the first and second idle wheels 401 and 402 are brought in contact with the upper inner surface 25 of the top profile 21.
A fifth optional step, in which the parallelism of the door to the wall is adjusted; this step is effected, in case of presence of the tilting component 60, by moving and locking the first and second movement and locking elements 61 and 62. The presence of the tilting component 60 is particularly preferred in situations where the door 11 and the wall 15 are not parallel to each other.

[0056] Advantageously, the sliding door as disclosed, comprising one or more of the disclosed devices and components, has one or more of the following advantages over known art:

- it allows simple installation and a high degree of anti-jamming safety;
- it allows effective management of parallelism problems between the door and the wall on which it is installed;
- it allows to damp the movement of the door both in the opening and in the closing, while simultaneously ensuring that it is arranged to operate as a wall-saver in case of oscillations of the door when it is slid between the extreme positions of opening and closing of the door opening;
- it allows the door to slide directly on the floor by reducing or even eliminating jerking of the door when it slides between the extreme opening and closing positions of the door opening.

[0057] Of course, obvious changes and/or variations to the above disclosure are possible, as regards dimensions, shapes, materials and components as well as details of the described construction and operation method without departing from the scope of the invention as defined by the claims that follow.

Claims

1. A device arranged to guide and support a sliding door (10) comprising:

- a frame element (19) securable to a stationary vertical wall (15),
- a guide and/or support component (40) connected to the frame element (19) and comprising at least one idle wheel (401, 402) arranged to guide and/or support a guide and/or support profile (21) securable to a door (11) of a sliding door (10), said guide and/or support component (40) being arranged to be moved and adjusted in vertical direction as to said frame element (19) by way of an adjustment element (41),

characterised by

- an anti-jamming component (50), comprising a lever (51) and arranged to be moved and adjusted in vertical direction as to the frame element (19) by way of said adjustment element (41), whereby by moving and adjusting in vertical direction said guide and/or support component (40) provides that said at least one idle wheel (401, 402) of said guide and/or support component (40) is brought into contact with said guide and/or support profile (21) and said anti-jamming component (50) is automatically brought into engagement with said guide and/or support profile (21) by way of said lever (51).

2. The device according to claim 1, wherein

- said lever (51) is resiliently loaded by a resilient element (54), and comprises

- a sealing end (56), and wherein

- said guide and/or support profile (21) comprises on an upper external surface (26),

- an outer contour (27a) arranged to cooperate, in use, with said sealing end (56) so as to avoid that said guide and/or support profile (21) goes out of the first device (14).

3. The device according to any one of claims 1 to 2, wherein said guide and/or support component (40) comprises a first (401) and a second idle wheel (402) arranged to guide and/or support said door (11) by way of said guide and/or support profile (21).

4. The device according to claim 3, further comprising a tilting component (60), arranged to cooperate with said guide and/or support component (40), and comprising

- one movement and locking element (61, 62) arranged to move on a horizontal surface and lock with a certain angle said first idle wheel (401) and said second idle wheel (402) in reverse directions as to said frame element (19).

5. The device according to any one of claims 1 to 2, further comprising

- a tilting component (60), arranged to cooperate with said guide and/or support component (40), and comprising

- at least one movement and locking element (61, 62) arranged to move said at least one idle wheel (401, 402) on a horizontal surface and lock said at least one idle wheel (401, 402) with a certain angle as to said frame element (19).

6. The device according to any one of claims 1 to 5, wherein said guide and/or support component (40) further comprises

- two additional idle wheels (403, 404) comprising a rotation axis that is parallel to the vertical wall (15).

7. A sliding door comprising

- a door (11) arranged to slide, in use, between extreme positions of an opening (12) of a stationary vertical wall (15),

characterised in that said sliding door (10) comprises a device as claimed in claims 1 to 6.

8. The sliding door according to claim 7 further comprising

- a sliding device (17) comprising at least one carriage (17a, 17b) fixed to a lower surface of said door and arranged to slide on a horizontal plane.

9. The sliding door according to claim 7 or 8, wherein

- said at least one carriage (17a, 17b) comprised in said sliding device (17) comprises

- a first and a second wheel (72a, 72b) adjacent each other comprising respective bearings (73a, 73b) covered by way of a covering made of polyurethane (76a, 76b) .

10. The sliding door according to claim 9, wherein said covering is made by way of casting polyurethane.

11. The sliding door according to any one of claims 7 to 10, further comprising, secured to at least one end of said guide and/or support profile (21),

- a shock absorbing device (18a, 18b) comprising

- shock absorbers (83) and a locking element (85) being of predetermined width (L) and arranged to absorb and lock the sliding of the door (11) between extreme positions of the opening (12), and
- an idle wheel (82) comprising a diameter larger than said predetermined width (L) and an axis that is parallel to the vertical wall (15), said idle wheel being arranged to work, in use, as a wall protection in case of oscillations of the door sliding between extreme positions of the opening (12).

12. A method for manufacturing a sliding door (10), comprising the steps of:

- providing a door (11),
- providing a guide and/or support profile (21) secured to the door (11),
- providing a device (14) comprising

- a frame element (19) securable to a stationary vertical wall (15),
- a guide and/or support component (40) connected to the frame element (19) and comprising at least one idle wheel (401, 402) arranged to guide and/or support the

guide and/or support profile (21), said guide and/or support component (40) being arranged to be moved and adjusted in vertical direction as to said frame element (19) by way of an adjustment element (41),
- an anti-jamming component (50) comprising a lever (51), said anti-jamming component (50) being arranged to be moved and adjusted in vertical direction as to the frame element (19) by way of the adjustment element (41),

- moving and adjusting in vertical direction said guide and/or support component (40) and said anti-jamming component (50) as to said frame element (19) by way of the adjustment element (41), and
- automatically bringing said at least one idle wheel (401, 402) of said guide and/or support component (40) into contact with said guide and/or support profile (21) and said anti-jamming component (50) into engagement with said guide and/or support profile (21) by way of said lever (51).

13. The method according to claim 12 comprising the further steps of:

- providing a sliding device (17) comprising at least one carriage (17a, 17b) arranged to slide on a horizontal plane,
- fixing the sliding device (17) to a lower surface (74) of said door (11) so that said sliding device (17) is arranged to slide on said horizontal plane.

14. The method according to claim 12 or 13 comprising the further steps of:

- providing a tilting component (60), associated to said guide and/or support component (40),
- moving by way of a movement and locking element (61, 62) said at least one idle wheel (401, 402) on a horizontal surface, and
- locking said at least one idle wheel (401, 402) in a certain position on said horizontal surface as to said frame element (19).

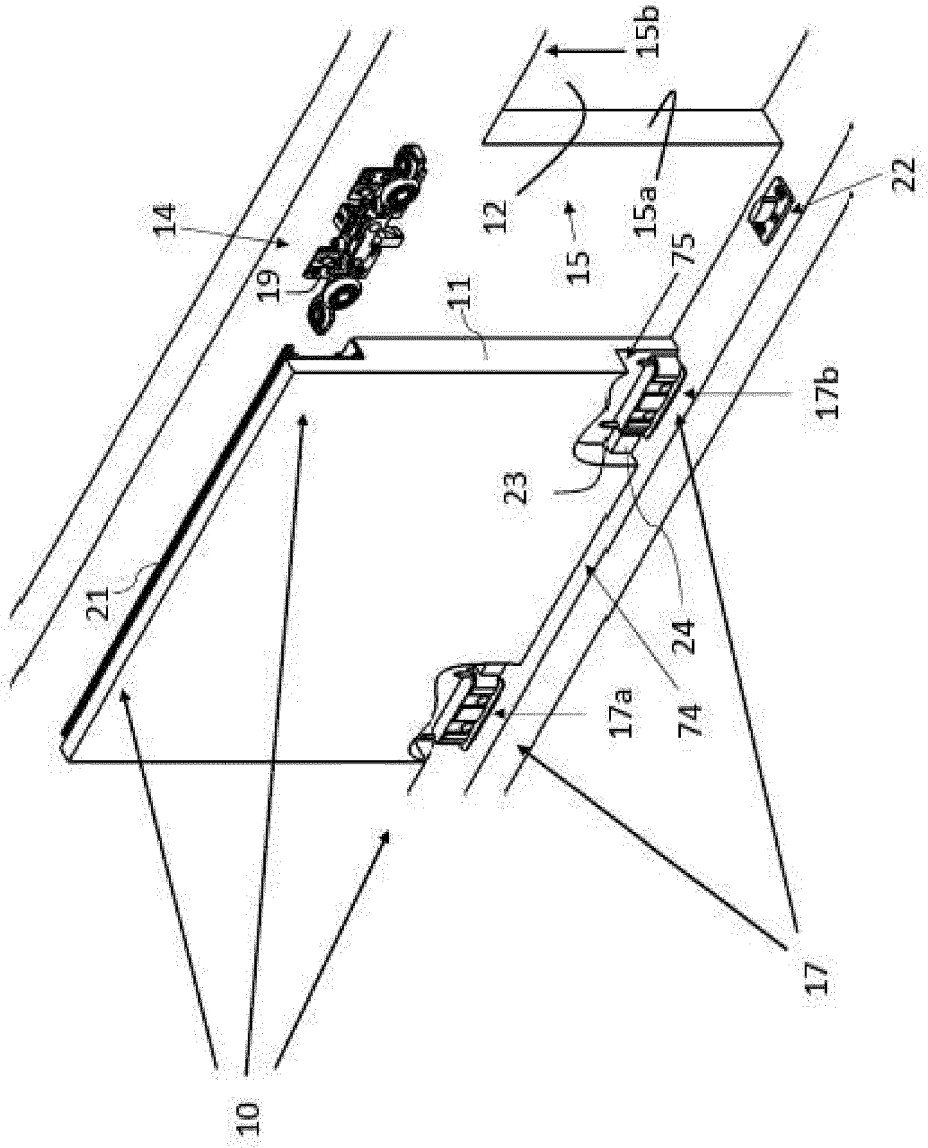

Fig. 1

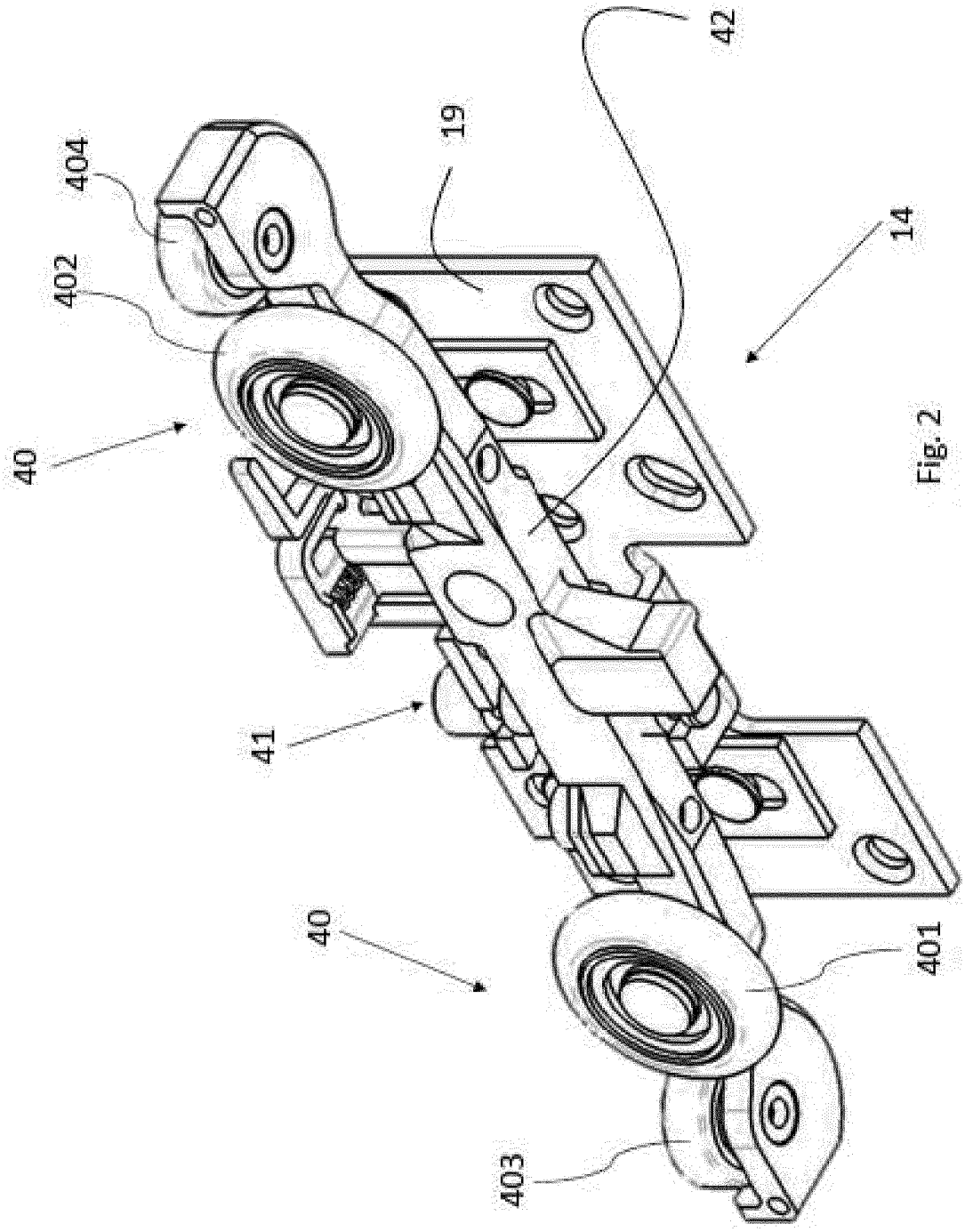

Fig. 2

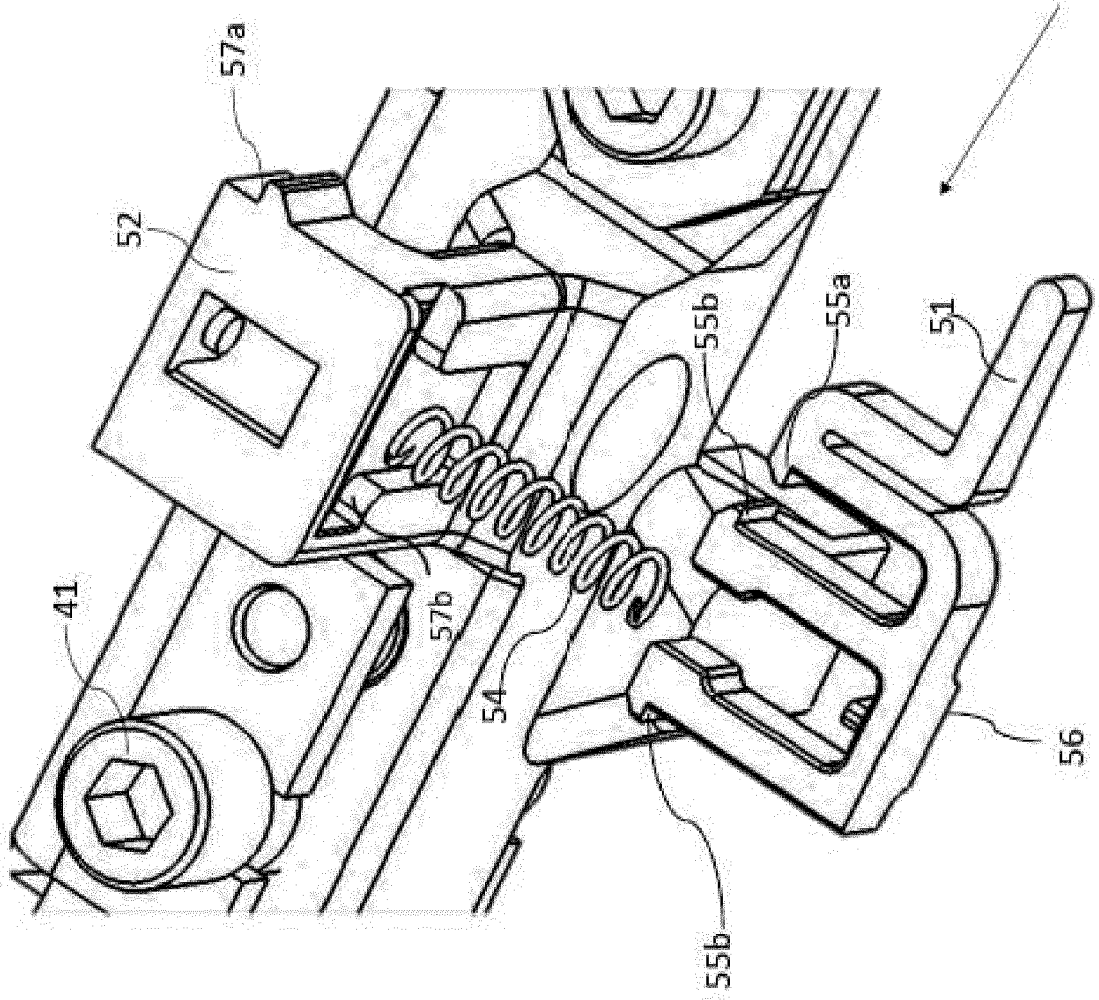

Fig. 3a

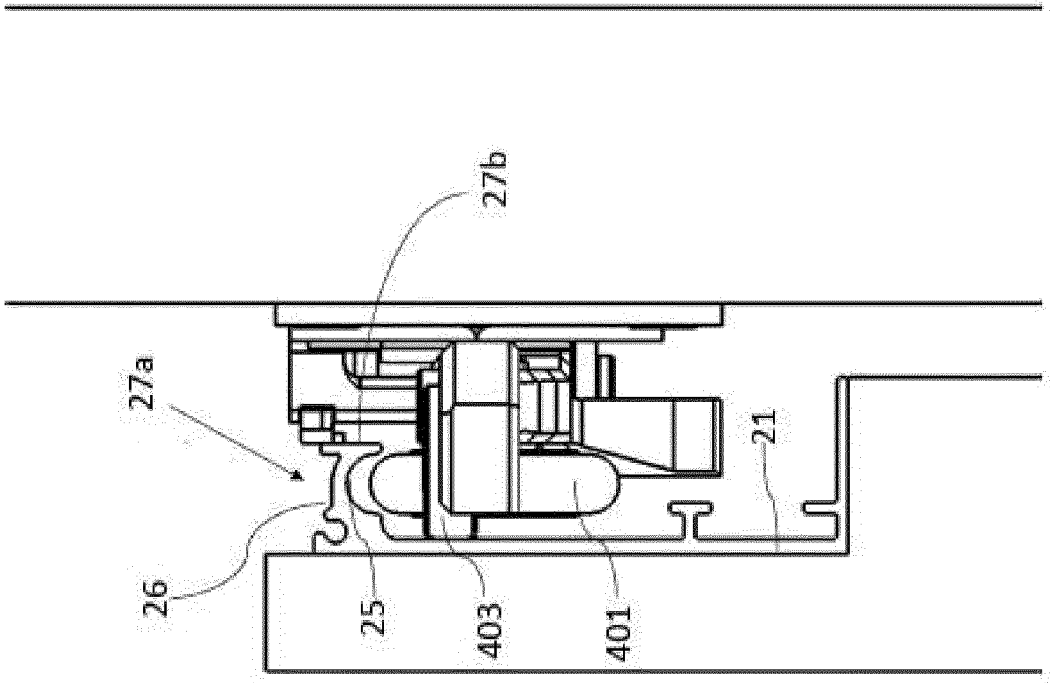

Fig. 3b

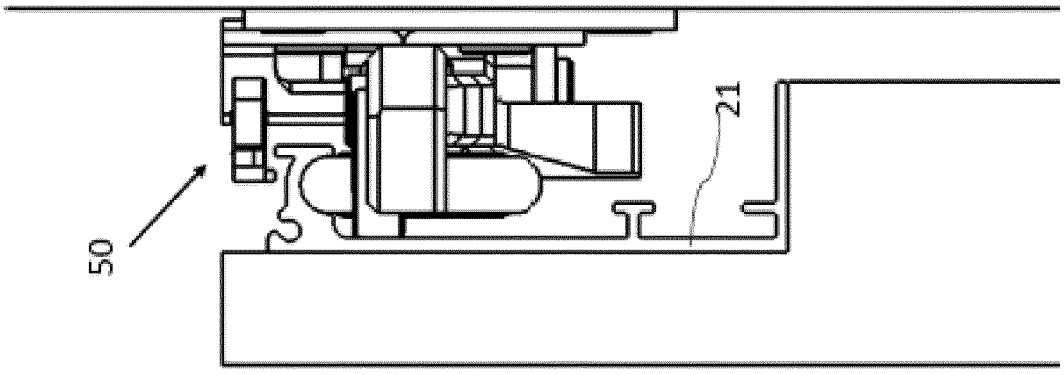

Fig. 3c

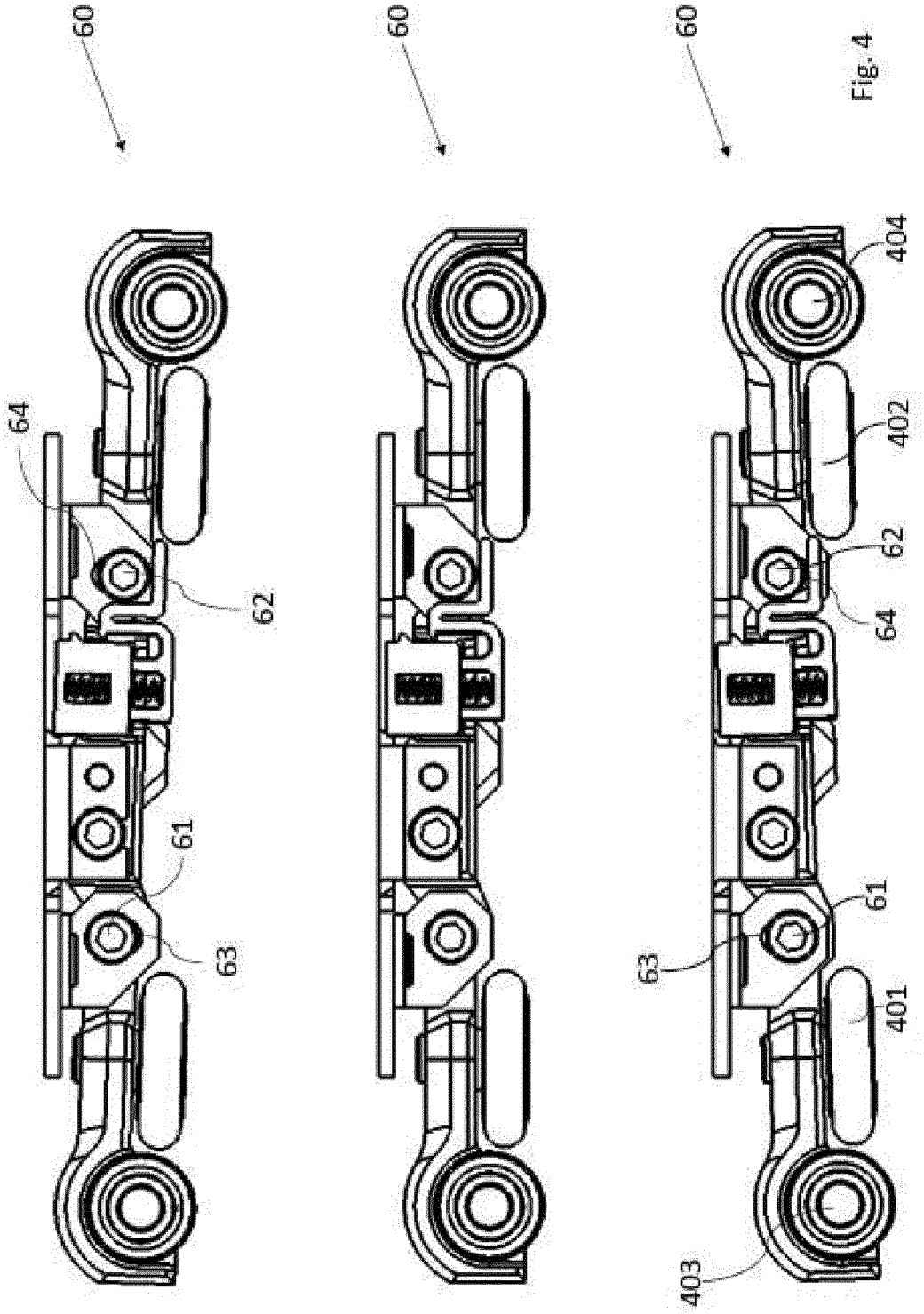

Fig. 4

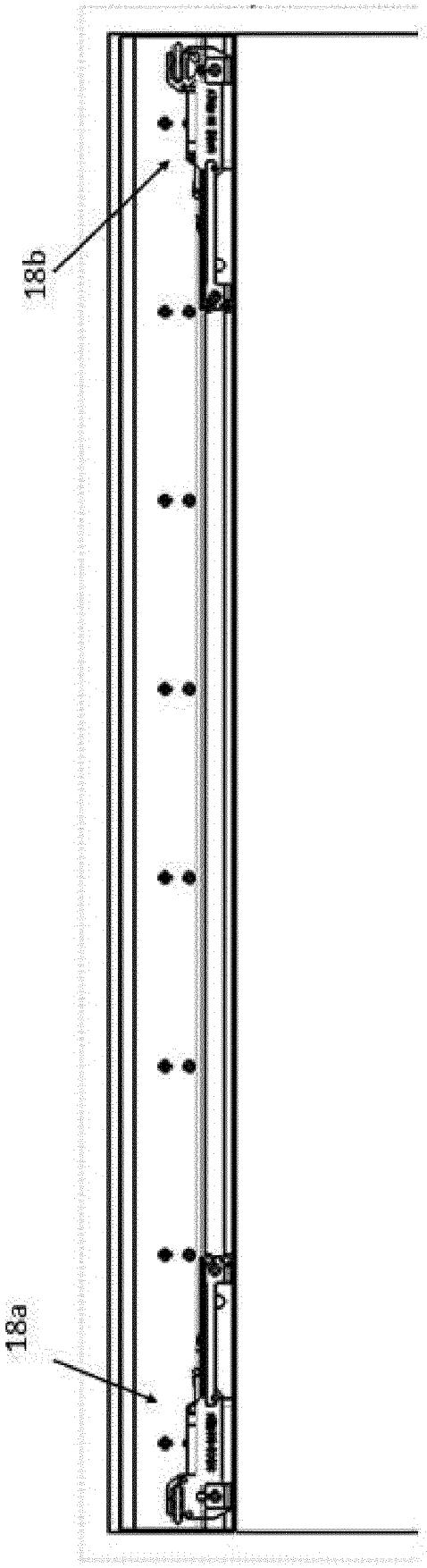

Fig. 5a

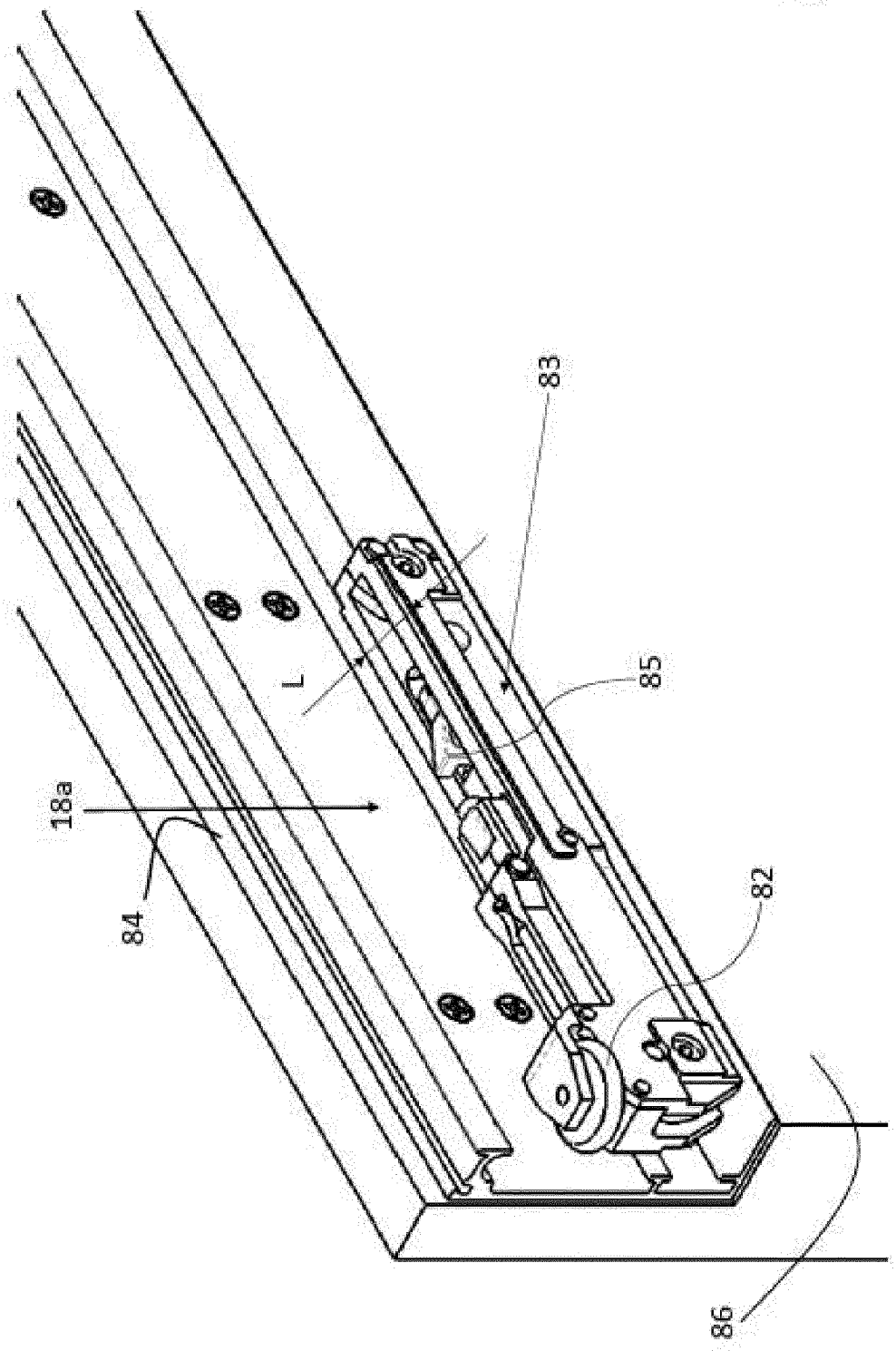

Fig. 5b

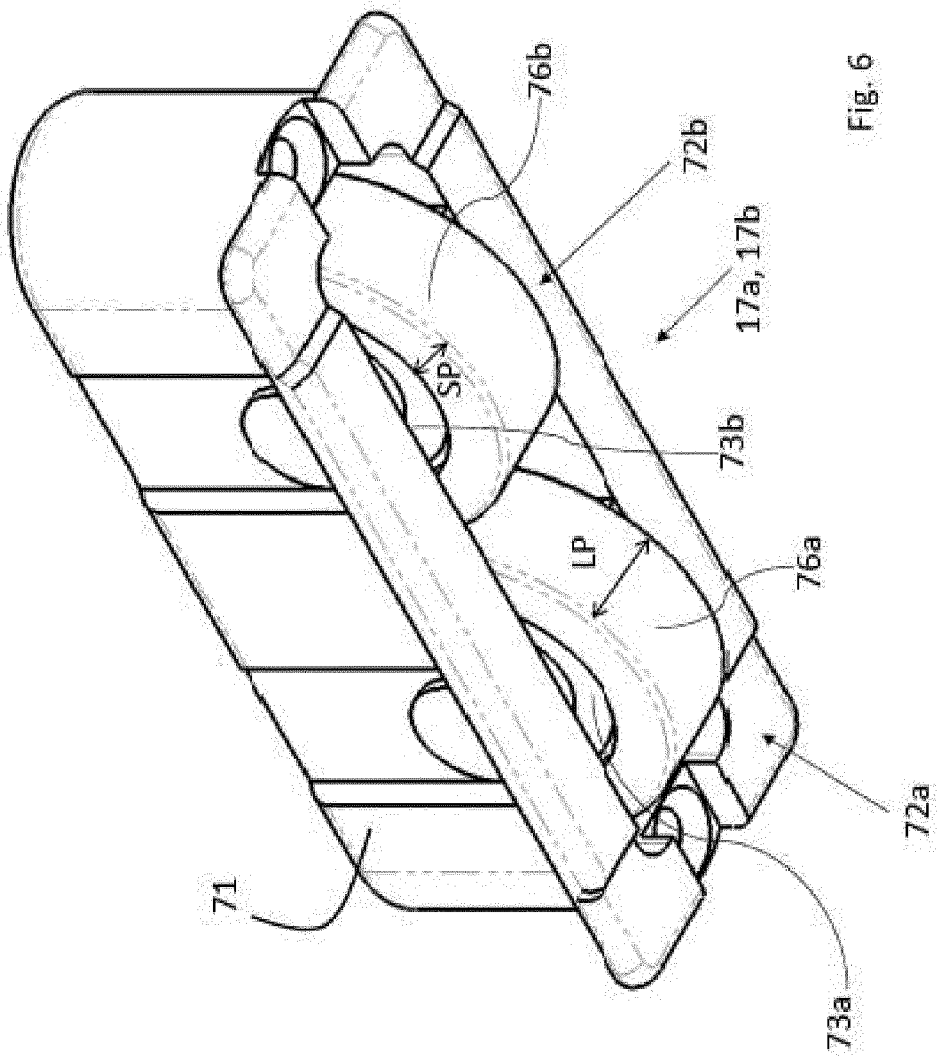

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 17 19 3208

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A	WO 2011/029770 A1 (HETTICH HEINZE GMBH & CO KG [DE]; NOLTE FRANK [DE]) 17 March 2011 (2011-03-17) * page 4, line 30 - page 5, line 13 * * page 5, line 35 - page 6, line 13 * * page 7, line 17 - line 24 * * figures 1-6 * -----	1-14	
			TECHNICAL FIELDS SEARCHED (IPC) E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 February 2018	Prieto, Daniel

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22-02-2018

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