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(54) **Sectional door system**

(57) A sectional door system comprising a number of pivotally coupled-together elongate door panels (2), which are movably supported in guide sections (3) near short sides, which sectional door system further comprises an elongate spring system (10) for assisting in moving the door panels. The spring system is connected to first and second mounting plates (14,16) near first and second ends, respectively. The first mounting plate (14) is provided with a pin (26) which is oriented in a plane extending substantially transversely to the door panels (2).

The pin (26) includes an angle of at least 5 degrees with the horizontal in an upwardly inclined direction, whilst the first end of the spring system is provided with a plate (31) provided with a passage (41). The passage can be positioned over the pin. At least the first mounting plate (14) and the plate (31) provided with the passage (41) comprise surfaces (22,37) extending at an angle to the vertical, which surfaces will abut against each other once the spring system (10) is connected to the mounting plates (14,16).

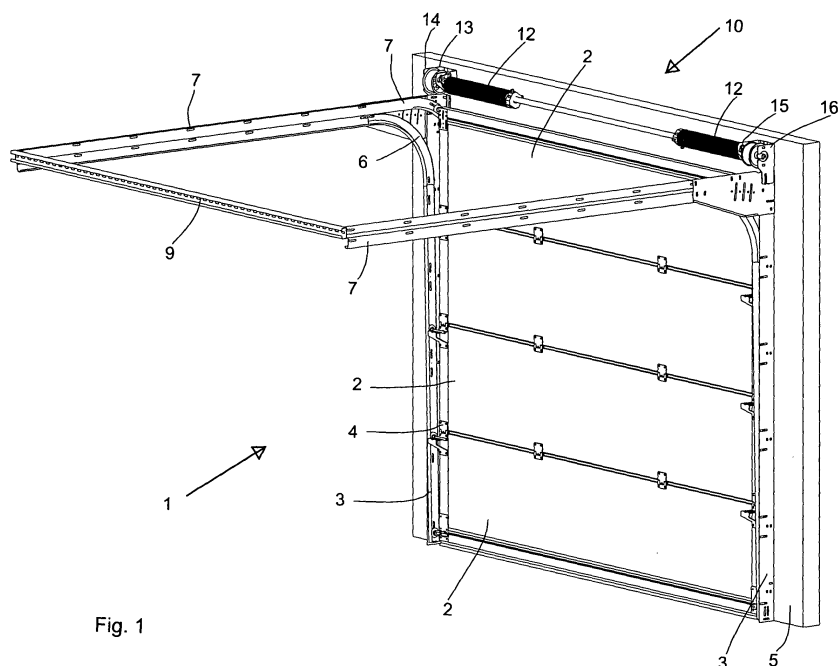


Fig. 1

Description

[0001] The invention relates to a sectional door system comprising a number of pivotally coupled-together elongate door panels, which are movably supported in guide sections near short sides, which sectional door system further comprises an elongate spring system for assisting in moving the door panels, which spring system is connected to first and second mounting plates near first and second ends, respectively.

[0002] In such a sectional door system, which is known from European patent application EP-A1-1 818 488, both ends of the spring system are provided with two pins extending parallel to each other in horizontal direction, which can be positioned in two passages formed in each of the mounting plates. The pins are provided with a so-called "unidirectional click system", which makes it possible to connect the spring system and the mounting plates together according to a substantially straight line.

[0003] A drawback of said sectional door system is that one person must lift the relatively heavy (about 25 kg) spring system when mounting the spring system and at the same time position the pins opposite the respective passages near the first end and near the second end and subsequently press said pins into said passages. The spring system is elongate in shape (2 - 5 m), which makes it difficult to handle.

[0004] The object of the invention is to provide a sectional door system in which the spring system can be connected to the mounting plate in a relatively simple manner.

[0005] This object is accomplished in a first embodiment of the sectional door system according to the invention in that at least the first mounting plate is provided with a pin which is oriented in a plane extending substantially transversely to the door panels, which pin includes an angle of at least 5 degrees with the horizontal in an upwardly inclined direction, whilst the first end of the spring system is provided with a plate provided with a passage, which passage can be positioned over the pin.

[0006] In a second embodiment of the sectional door system said object is accomplished in that at least the first end of the spring system is provided with a pin which is oriented in a plane extending substantially transversely to the panels, which pin includes an angle of at least 5 degrees with the horizontal in a downwardly inclined direction, whilst the first mounting plate is provided with a passage in which the pin can be positioned.

[0007] In the first embodiment, the inclined pin of the first mounting plate enables an installer to position the passage in the plate connected to the first end over the pin in a simple manner. The force of gravity will cause the plate, and thus the first end, to slide down over the pin, thus ensuring that the plate is securely suspended from the pin. The spring system can then be pivoted about the pin until the second end is positioned opposite the second mounting plate, whereupon the second end is connected to the second mounting plate. It is also pos-

sible, of course, to connect the two ends simultaneously to the mounting plates.

[0008] In the second embodiment, in which the first end is provided with a pin, said pin is positioned in the passage in the first mounting plate. In this case, too, the presence of the downwardly inclined pin ensures that the first end is securely positioned in the passage under the influence of the force of gravity.

[0009] When the second end is being connected to the second mounting plate, the risk that the first end will become detached from the first mounting plate is excluded because the first end would first have to move upwards with respect to the first mounting plate in that case so as to disconnect the pin and the passage from each other.

[0010] It is noted that from EP-A1-1 972 745 there is known a sectional door system in which the spring system is first attached with a first end thereof and then pivoted for attaching the second end. The first end is connected to the mounting plate by means of a unidirectional click system, however, which extends in horizontal direction. This involves the risk of the unidirectional click system easily becoming detached, because this only requires a horizontal movement. Consequently, an installer must make sure not only that the first end is connected to the mounting plate, but also that the unidirectional click system is mounted in such a manner that it cannot become detached. With the sectional door systems according to the invention, an installer only needs to effect a connection between the inclined pin and the passage, whereupon the first end is securely connected to the mounting plate under the influence of the force of gravity as a result of the angle at which the pin extends. Not until the second end is securely connected to the second mounting plate as well can an installer lock the ends of the elongate spring system and the mounting plates together, thus preventing the spring system from becoming detached undesirably when a force is exerted in upward direction thereon.

[0011] Another embodiment of the sectional door system according to the invention is **characterised in that** the second end of the spring system and the second mounting plate are provided with the same passage or pin as the first end and the first mounting plate. As a result, the two ends of the spring system are connected to the mounting plate in an identical manner.

[0012] Yet another embodiment of the sectional door system according to the invention is **characterised in that** the pin comprises screw thread, onto which a nut can be screwed after the passage has been positioned over the pin.

[0013] The nut locks the spring system and the mounting plate together.

[0014] Yet another embodiment of the sectional door system according to the invention is **characterised in that** at least the first mounting plate and the plate provided with the passage comprise surfaces extending at an angle to the vertical, which surfaces will abut against each other once the spring system is connected to the

mounting plates.

[0015] The surfaces extending at an angle to the vertical provide a secure connection between the plate and the mounting plate. Preferably, the second mounting plate and the plate connected to the second end are configured in the same manner.

[0016] It is noted that it is not possible to use such surfaces extending at an angle to the vertical in the sectional door system according to EP-A1-1 972 745, because the unidirectional click system makes it necessary to press the first end directly against the first mounting plate in order to effect a connection, so that pivoting of the spring system about the pin would no longer be possible if surfaces extending at an angle to the vertical were to be present.

[0017] In the sectional door system according to the invention, the first end is spaced from the first mounting plate once the pin is positioned in the passage, so that pivoting of the spring system about the pin will still be possible. Only after the second end has been connected to the second mounting plate as well will the first and the second end be moved further downwards under the influence of the force of gravity, causing the surfaces extending at an angle to the vertical being to be positioned into abutment with each other.

[0018] The invention will now be explained in more detail with reference to the drawings, in which:

Figure 1 is a perspective view of a sectional door system according to the invention;

Figure 2 is a perspective detail view of the left-hand upper end of the sectional door system shown in figure 1;

Figure 3 is a perspective view of a part of the view shown in figure 2;

Figure 4 is a perspective view of a part of the view shown in figure 3;

Figure 5 is a perspective view of a part of the view shown in figure 4;

Figure 6 is a side view of the view shown in figure 4;

Figures 7-12 show alternative embodiments inter alia of the mounting plate of the sectional door system according to the invention;

Figure 13 shows an alternative embodiment of the sectional door system shown in figure 1.

[0019] Like parts are provided with the same numerals in the figures.

[0020] Figures 1-6 show various views of a first embodiment of a sectional door system 1 according to the invention, which comprises a number of pivotally coupled-together elongate door panels 2, which are movably supported in guide sections 3 via guide wheels 4. The guide sections 3 are fixed to a wall 5 of a building, for example a garage. An opening is provided in the wall 5, which opening is closed and hidden from view by the door panels 2. The vertically extending guides 3 are connected to horizontally extending guides 7 via arcuate

guides 6. Near the arcuate guides 6, the horizontally extending guides 7 are provided with an additional guide 8 for guiding the upper side of the upper door panel 2. Such guides 3, 6, 7, 8 are known per se and will not be explained in more detail herein, therefore. The horizontally extending guides 7 are connected via a cross beam 9 on a side remote from the wall 5. Near the wall 5 and near ends of the guides 8, the sectional door system 1 is provided with a spring system 10, which comprises a shaft 11, among other parts, extending parallel to the door panels 2, as well as two coil springs 12. The spring system 10 is connected to a first mounting plate 14 fixed to the wall 5 near a first end 13 and to a second mounting plate 16 fixed to the wall 5 near a second end 15.

[0021] The sectional door system 1 further comprises an electrically driven motor (not shown) by means of which the panels 2 can be moved from the position shown in figure 1, in which the opening in the wall 5 is closed, to a position in which the panels 2 lie in a plane defined by the guides 7 and the beam 9, in which the opening in the wall 5 is released. Such a manner of driving is known per se and will not be explained in more detail herein, therefore.

[0022] As is clearly shown in figures 2-6, the first mounting plate 14 comprises a part 18 extending parallel to the wall 5 and a part 19 extending transversely thereto. The part 18 is provided with holes 20 for fixing the first mounting plate 14 to the wall 5. As is clearly shown in figure 6, the part 18 of the first mounting plate 14 comprises a profiled portion comprising inter alia four surfaces 22, 23, 24, 25 extending at an angle to the vertical 21. The surface 22 extends in a direction away from a lower side of the wall 5 and is provided with a pin 26 that extends in upward direction. The pin 26 includes an angle α of 5-80° with the horizontal 27, preferably an angle of more than 15° and less than 45°.

[0023] The first end 13 of the spring system 10 is provided with a plate 31 comprising a part 32 extending parallel to the wall 5 and a part 33 extending transversely thereto. The part 33 inter alia comprises a bearing 34, in which the shaft 11 of the spring system 10 is supported. On a side of the plate 33 remote from the coil spring 12 of the spring system 10, the shaft 11 is provided with a drum 35, on which a cable is wound, which cable is connected to the lowermost door panel 2 with an end remote from the spring system 10. The operation of such a drum 35 and the cable 2 connected thereto is known per se and will not be explained in more detail herein, therefore. The part 32 of the plate 31 is provided with a profiled portion which, as is clearly shown in figure 6, comprises four surfaces 37, 38, 39, 40 extending at an angle to the vertical 21, which surfaces correspond to the surfaces 22, 23, 24, 25 as regards their dimensions and form, such that the part 32 can be positioned against the part 18, with the respective surfaces 22, 37; 23, 38; 24, 39 and 25, 40 abutting against each other. The surface 37 is provided with a passage 41, whose dimension is larger than the diameter of the pin 26.

[0024] Upon installation of the sectional door system 1 according to the invention, in particular the spring system 10 thereof, the first and the second mounting plate 14 are preferably first fixed to the wall 5, correctly spaced, at the desired height. The second mounting plate 16 is the mirror-symmetrical image of the first mounting plate 14 and is provided inter alia with a pin 26 in the same manner as the first mounting plate 14.

[0025] Prior to being connected to the mounting plate 14, 16, the spring system 10 has been provided with the shaft 11, the springs 12, the plate 31, the drums 35, etc.

[0026] The guides 6, 7, 8 and the cross beam 9 are not fitted yet when the spring system 10 is connected to the mounting plate 14, 16.

[0027] An installer will take hold of the first end 13 of the spring system 10 and 15 and lift it until the passage 41 in the surface 37 is positioned opposite the pin 26 of the first mounting plate 14, so that the passage 41 can be positioned over the pin 26 (see figure 5). The upper edge 42 of the passage 41 is now supported on the pin 26. The first end 13 will tend to move along the pin 26 in the direction of the surface 22 under the influence of the force of gravity.

[0028] The second end 15 of the spring system 10 need not be supported when the first end 13 is being connected to the first mounting plate 14, and consequently it will be inclined downwards. As a result, the surfaces 37, 38, 39, 42 do not extend parallel to the respective surfaces 22, 23, 24, 25, and the passage 41 can be moved over the pin 26 up to the surface 22. Subsequently, the second end of the spring system 10 will be taken hold of and be pushed in the direction of the second mounting plate 16. During said movement, the spring system 10 will pivot about the pin 26. Near the second mounting plate 16, the passage 41 in the surface 37 of the plate 31 of the second end 15 is positioned opposite the pin 26 of the second mounting plate 16 and moved over the pin 26 in the direction of the surface 22. Because the passages 41 of both ends 13, 15 are now positioned over the pins 26 of the mounting plate 14, 16, the surfaces 37, 38, 40 of the plates 31 extend parallel to the surfaces 22, 23, 24, 25 of the mounting plates 14, 16, so that the plates 31 can be moved further in the direction of the part 18 of the mounting plate 14, until the surfaces 37, 38, 39, 40 abut against the respective surfaces 22, 23, 24, 25.

[0029] The abutting surfaces ensure that the ends 13, 15 will be correctly positioned against the mounting plate 14, 16. The pins 26 merely function to facilitate the mounting of the spring system 10, and the passages 41 may be relatively large, so that positioning the passages 41 over the pins 26 will be relatively easy. The pins 26 are preferably provided with screw thread, onto which a nut 44 can subsequently be screwed. If the pins 26 are provided with screw thread, the pins 26 also function to secure the ends 13, 15 to the mounting plates 14, 16. It is also possible, however, to secure the ends 13, 15 to the respective mounting plates 14, 16 using separate fixing means.

[0030] Figures 7-11 show other embodiments of the parts 18 of the mounting plates 14, 16 and the parts 32 of the plate 31 that abut against said parts 18.

[0031] In the embodiment shown in figure 7, the parts 18', 32' extend fully parallel to each other in the mounted condition.

[0032] In the embodiment shown in figure 8, the parts 18", 32" do not extend parallel to each other between the inclined surfaces 22, 37; 23, 38, so that the part 32" is relatively simple in shape.

[0033] In the embodiment shown in figure 9, the parts 18"', 32"' comprise only one surface 22, 37 extending at an angle to the vertical.

[0034] The same applies as far as the embodiment shown in figure 10 is concerned, in which the parts 18^{IV}, 32^{IV} each comprise one plane 22, 37, which includes an angle with the vertical, whilst the parts 18^{IV}, 32^{IV} further comprise horizontally extending surfaces 51, 52.

[0035] In the embodiment shown in figure 11, the parts 18^V, 32^V each have a curved surface 53, 54 provided with the pin 26 and with the passage 41, respectively. In this way a correct positioning of the parts 18^{VI}, 32^{VI} relative to each other can be realised.

[0036] In the embodiment shown in figure 12, the part 18^{VI} forming part of the first end 14 or the second end 16 is provided with an opening 55, whilst the part 32^{VI} that is connected to the first or the second end is provided with a pin 56, which extends in downward direction and which includes an angle with the horizontal comparable to the angle α that the pin 26 includes with the vertical. When the embodiment shown in figure 12 is being mounted, the pin 56 is inserted into the opening 55. The opening 55 must be dimensioned so that the pin 56 can be easily inserted into the passage 55.

[0037] Figure 13 shows another embodiment of the sectional door system 61 according to the invention, in which the spring system 10 is connected to the first and the second end 62, 63 remote from the wall 5 of the guides 7 rather than to the wall 5. In this embodiment, the mounting plates 14, 16 are connected to the ends 62, 63. The spring system 10 is connected to the ends 62, 63 of the sections in a similar manner as in the sectional door system 1 according to figure 1.

[0038] It is also possible for the shaft 11 to comprise one spring or more than two springs.

Claims

1. A sectional door system comprising a number of pivotally coupled-together elongate door panels, which are movably supported in guide sections near short sides, which sectional door system further comprises an elongate spring system for assisting in moving the door panels, which spring system is connected to first and second mounting plates near first and second ends, respectively, **characterised in that** at least the first mounting plate is provided with a pin

which is oriented in a plane extending substantially transversely to the door panels, which pin includes an angle of at least 5 degrees with the horizontal in an upwardly inclined direction, whilst the first end of the spring system is provided with a plate provided with a passage, which passage can be positioned over the pin. 5

2. A sectional door system comprising a number of pivotally coupled-together elongate door panels, which are movably supported in guide sections near short sides, which sectional door system further comprises an elongate spring system for assisting in moving the door panels, which spring system is connected to first and second mounting plates near first and second ends, respectively, **characterised in that** at least the first end of the spring system is provided with a pin which is oriented in a plane extending substantially transversely to the panels, which pin includes an angle of at least 5 degrees with the horizontal in a downwardly inclined direction, whilst the first mounting plate is provided with a passage in which the pin can be positioned. 10
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3. A sectional door system according to claim 1 or 2, **characterised in that** the second end of the spring system and the second mounting plate are provided with the same passage or pin as the first end and the first mounting plate. 25
30
4. A sectional door system according to any one of the preceding claims, **characterised in that** said pin comprises screw thread, onto which a nut can be screwed after the passage has been positioned over the pin. 35
5. A sectional door system according to any one of the preceding claims, **characterised in that** at least the first mounting plate and the plate provided with the passage comprise surfaces extending at an angle to the vertical, which surfaces will abut against each other once the spring system is connected to the mounting plates. 40
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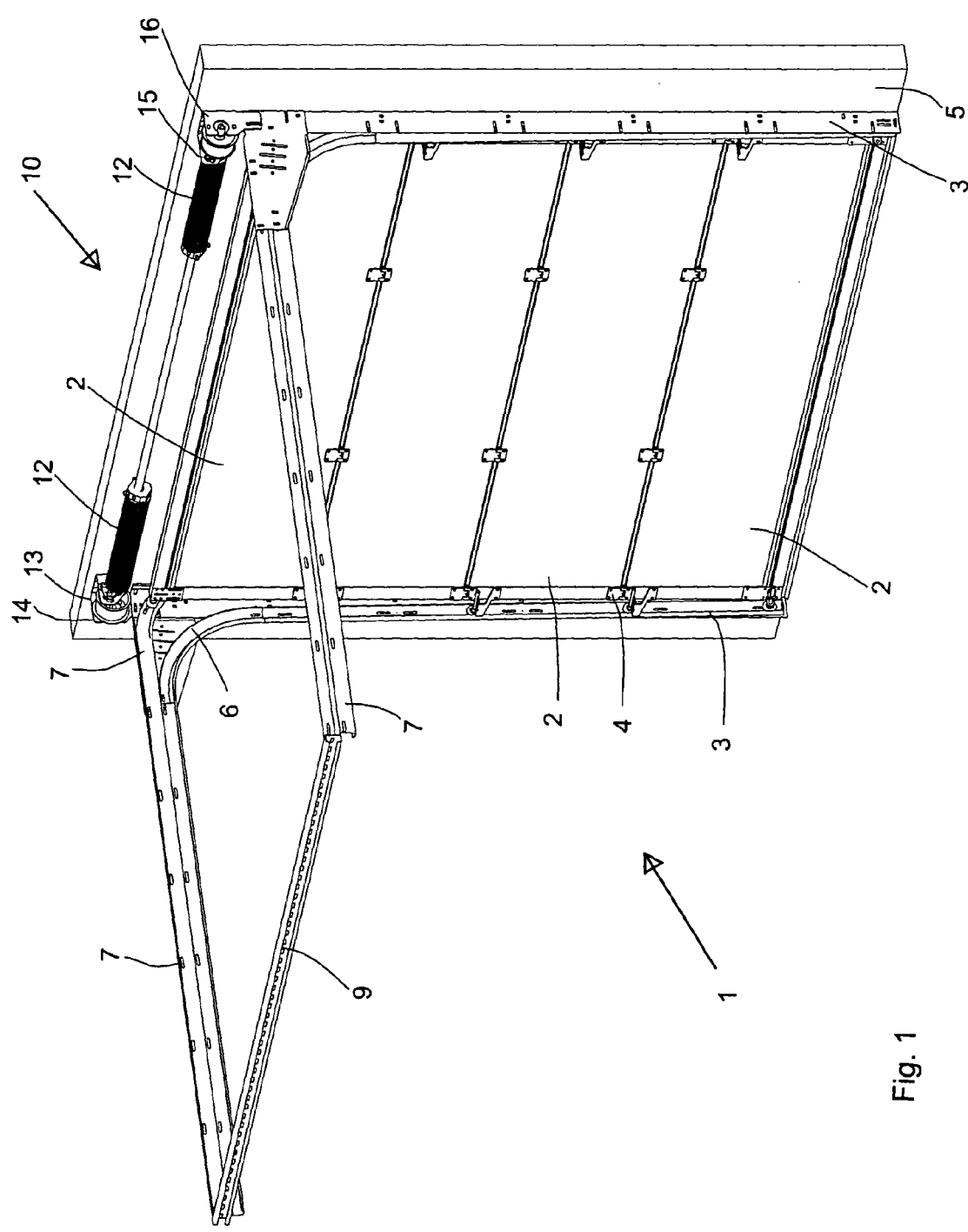


Fig. 1

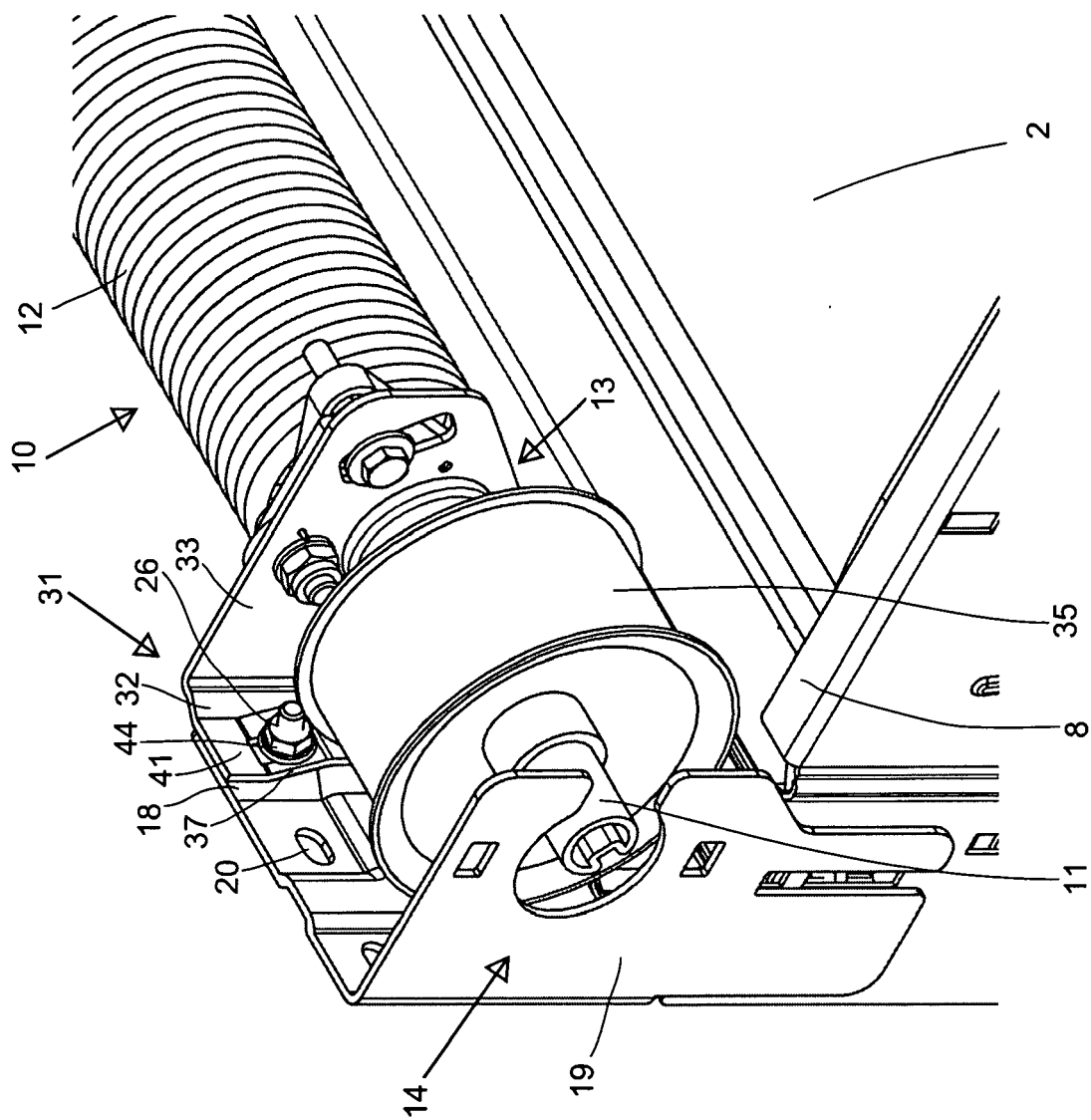


Fig. 2

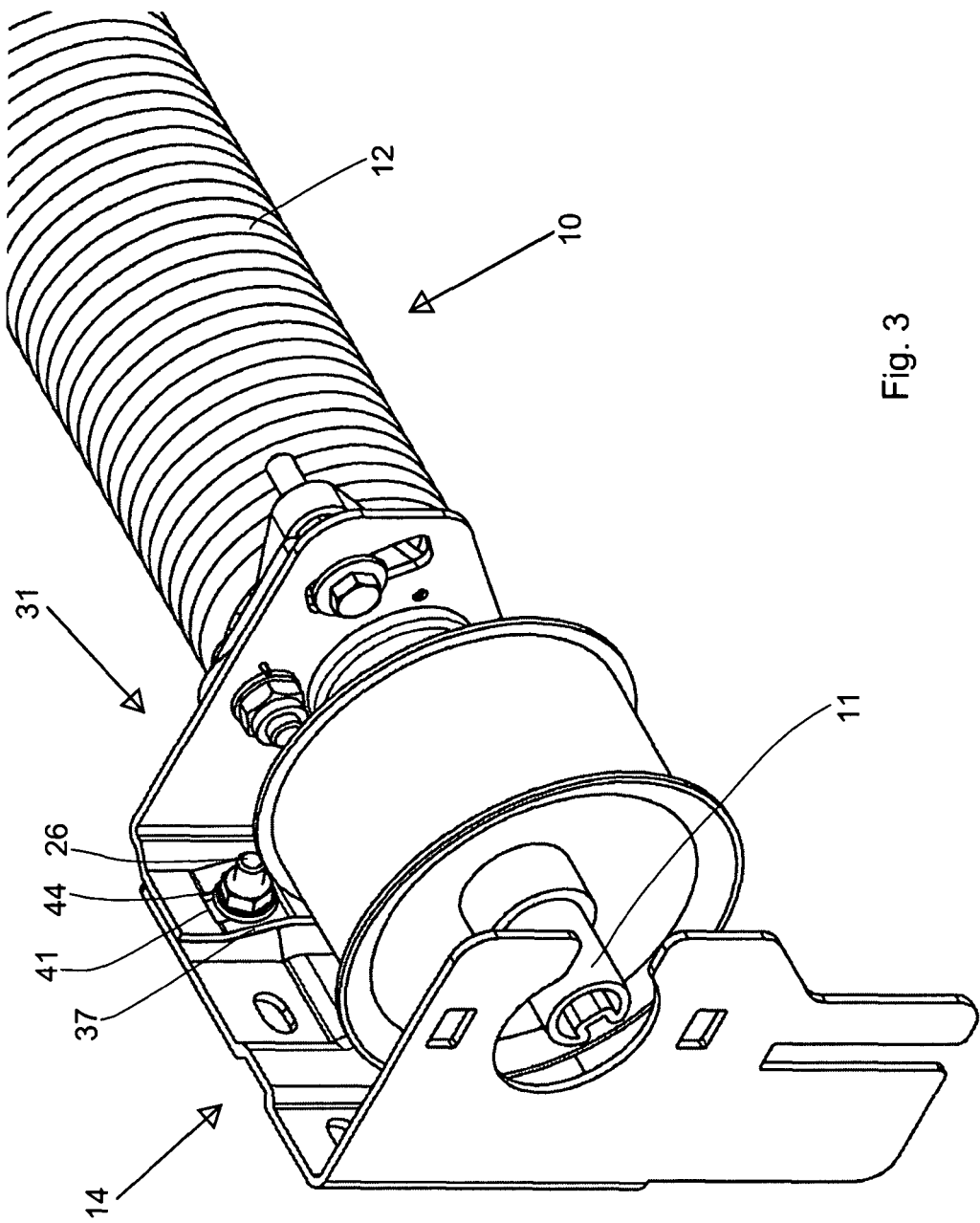


Fig. 3

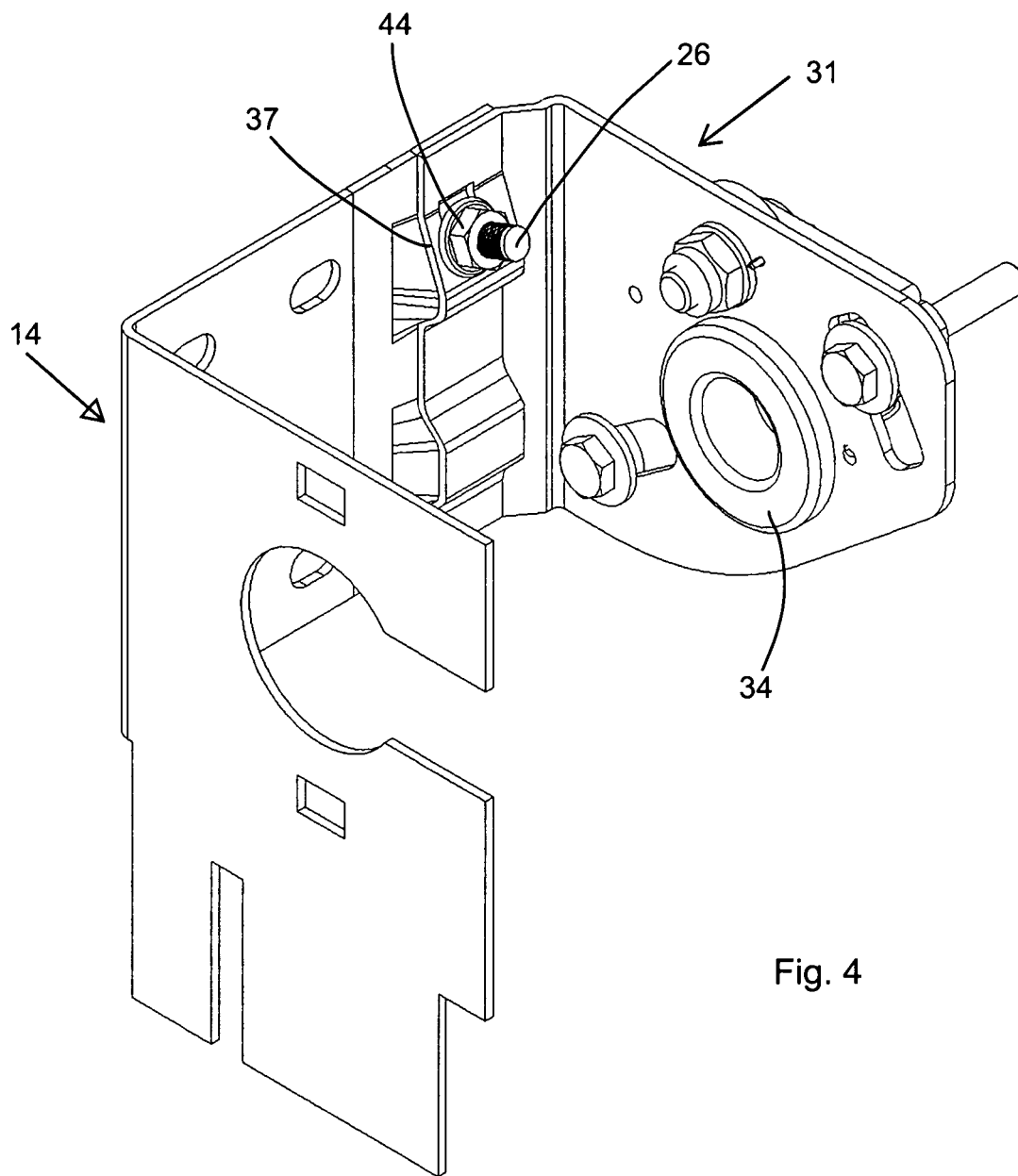


Fig. 4

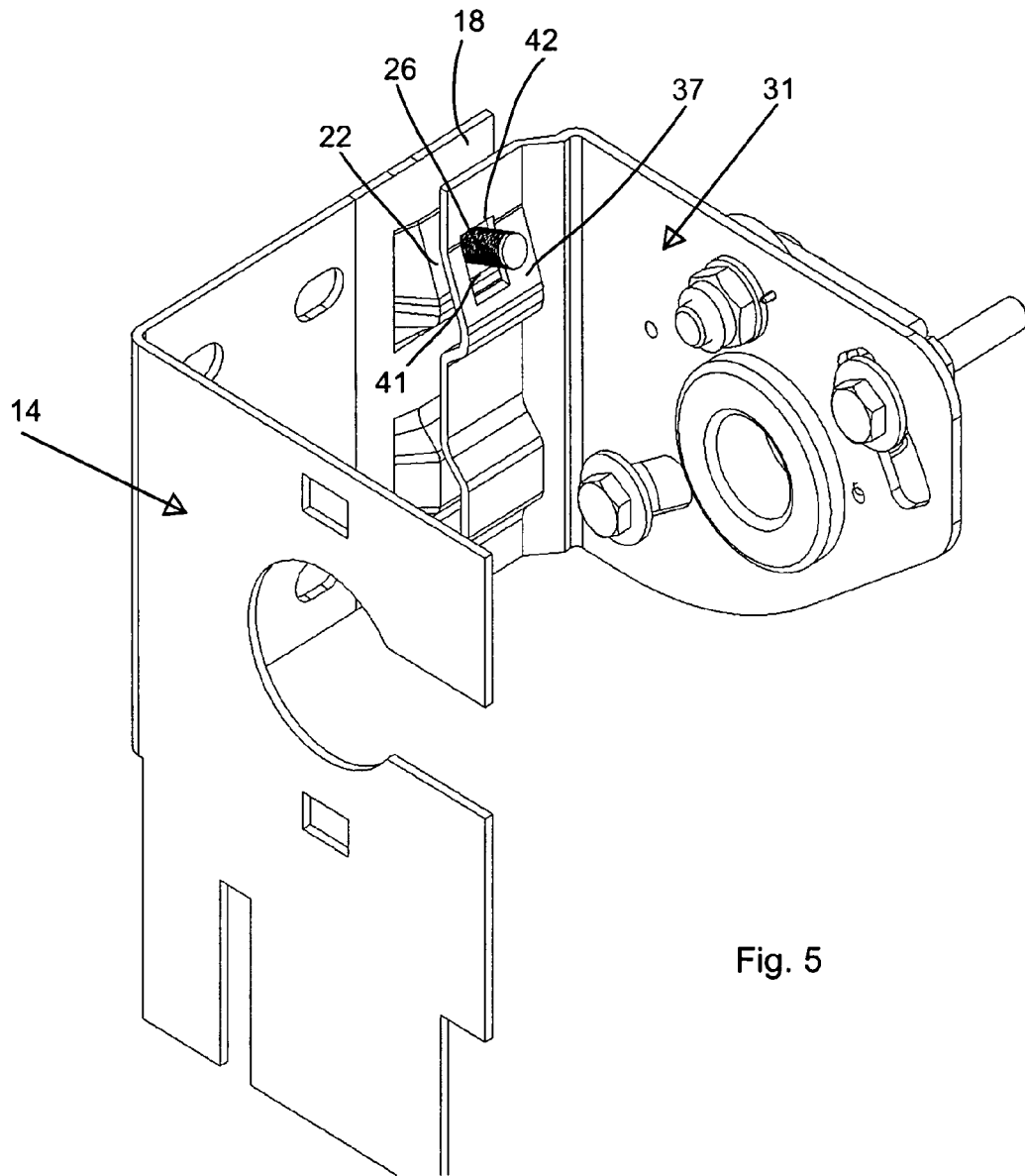


Fig. 5

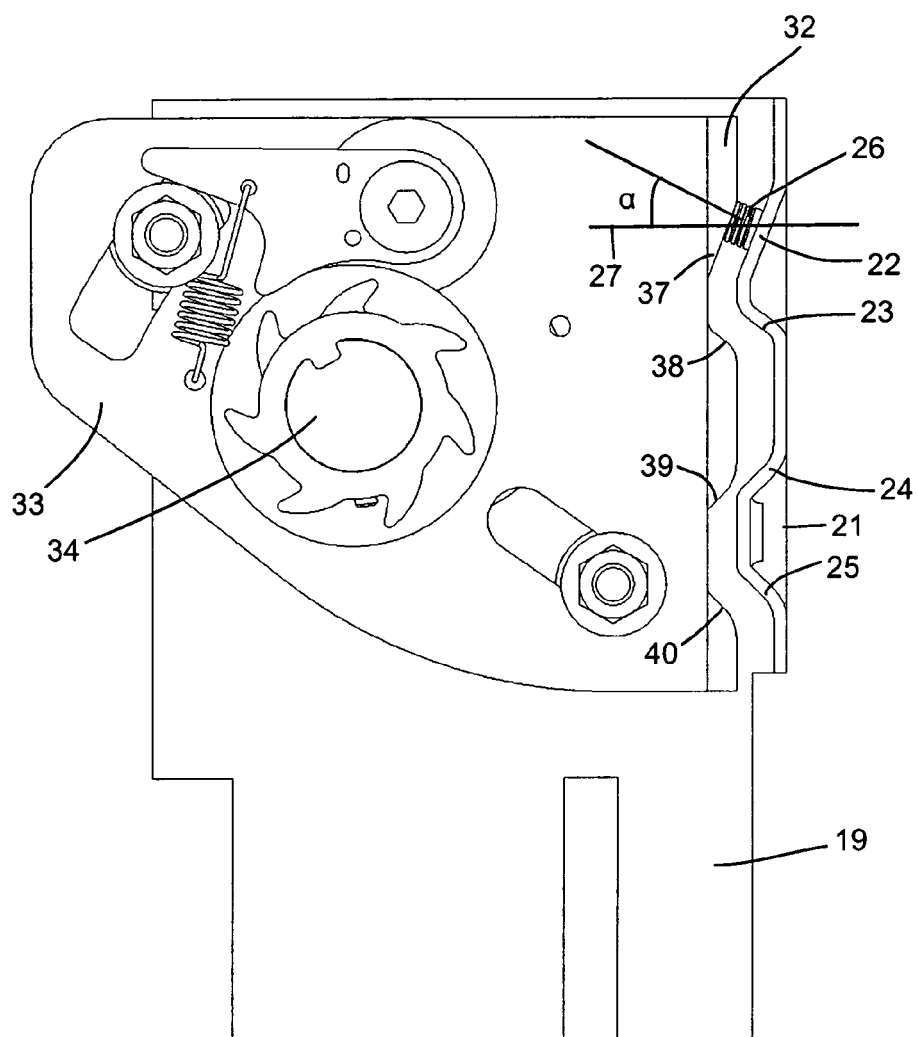


Fig. 6

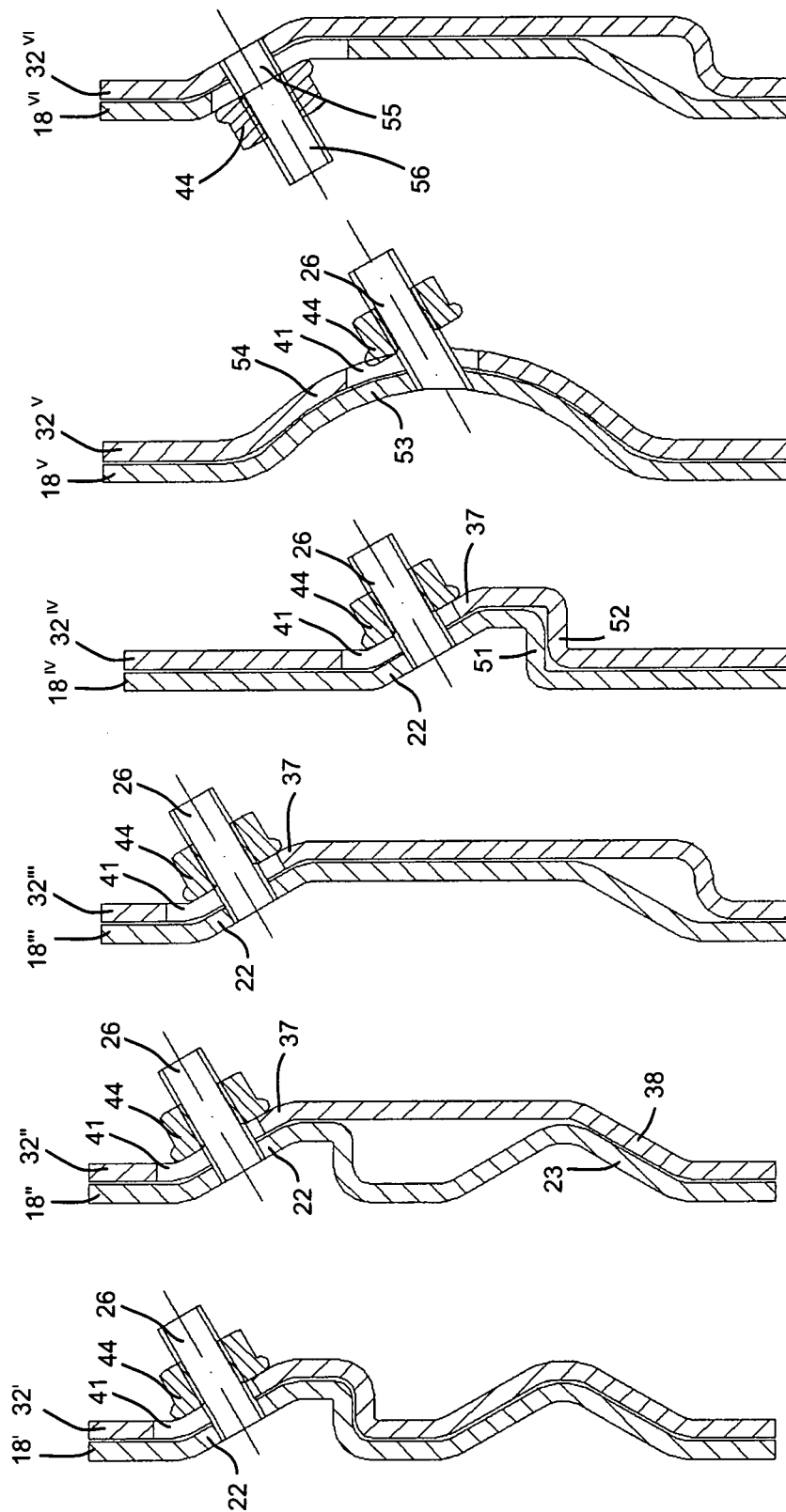


Fig. 7

Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

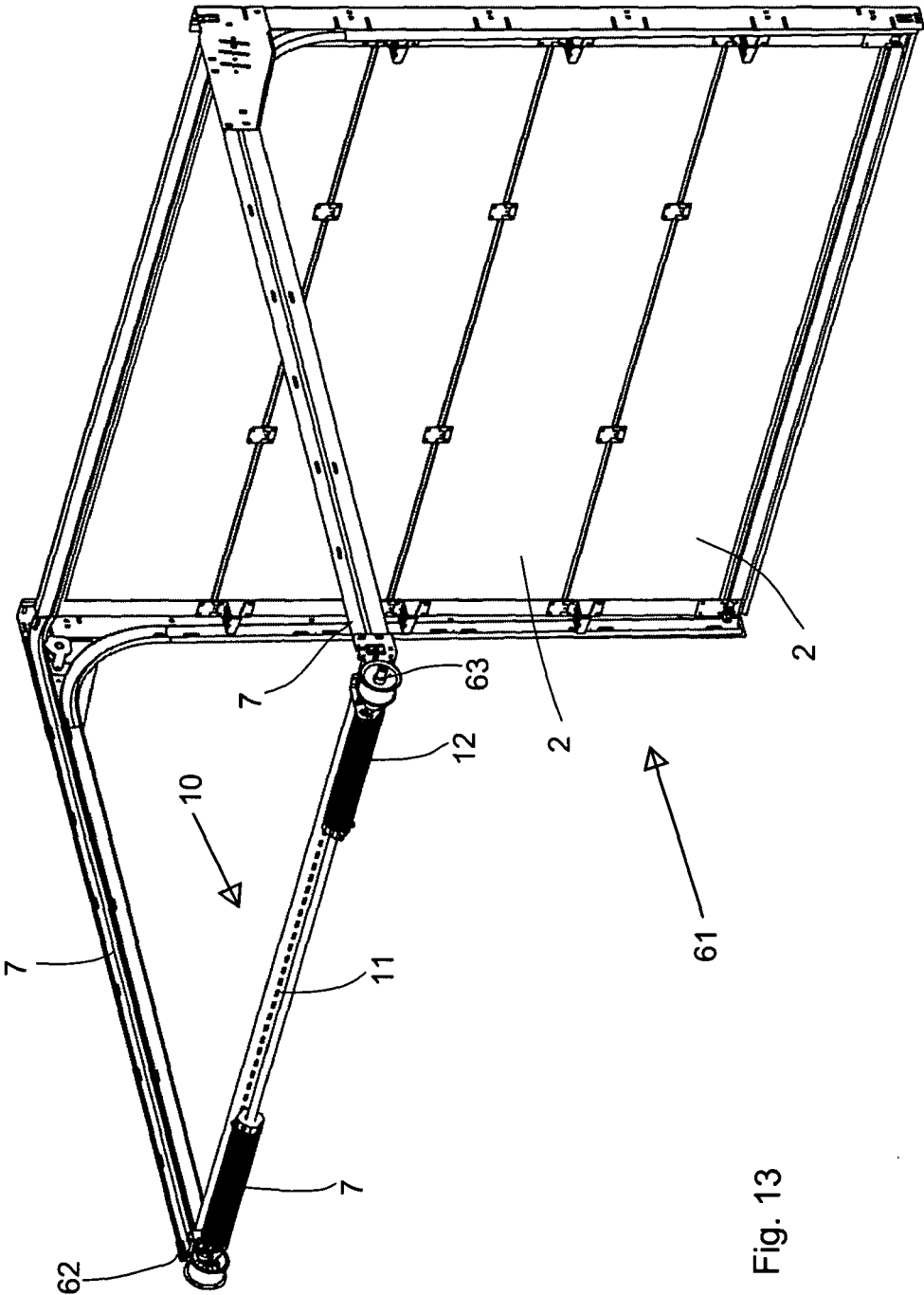


Fig. 13



EUROPEAN SEARCH REPORT

Application Number
EP 09 07 5576

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 1 972 745 A (FLEXI FORCE B V [NL]) 24 September 2008 (2008-09-24) * abstract *	1-3	INV. E05D13/00
A	----- US 5 964 268 A (CARPER KENNETH E [US] ET AL) 12 October 1999 (1999-10-12) * column 12, last paragraph * * figures *	1-2	
A	----- US 3 038 535 A (STROUP EARL L ET AL) 12 June 1962 (1962-06-12) * column 2, line 49 - line 57 * * column 3, line 33 - line 45 * * figures *	1-2	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 March 2010	Examiner Van Kessel, Jeroen
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EP 09 07 5576

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03-03-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1972745	A	24-09-2008	NONE	

US 5964268	A	12-10-1999	AU 2828195 A	05-01-1996
			CA 2191102 A1	21-12-1995
			DE 69512058 D1	14-10-1999
			DE 69512058 T2	27-01-2000
			EP 0765425 A1	02-04-1997
			WO 9534733 A1	21-12-1995

US 3038535	A	12-06-1962	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1818488 A1 [0002]
- EP 1972745 A1 [0010] [0016]