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(54) **Sectional door**

(57) Sectional gate (1) comprising an articulated wall consisting of panels (2) coupled together; at least two guide rails (5); driving means like for example an electric motor (14); a spring system (10) which is connected with the articulated wall, characterised in that at least two components, a first component (13) and a second component (17), of the sectional gate (1) are coupled together by means of a so called "unidirectional click-system" which makes it possible to mount the at least two components (13,17) by bringing then together according to a general straight line.

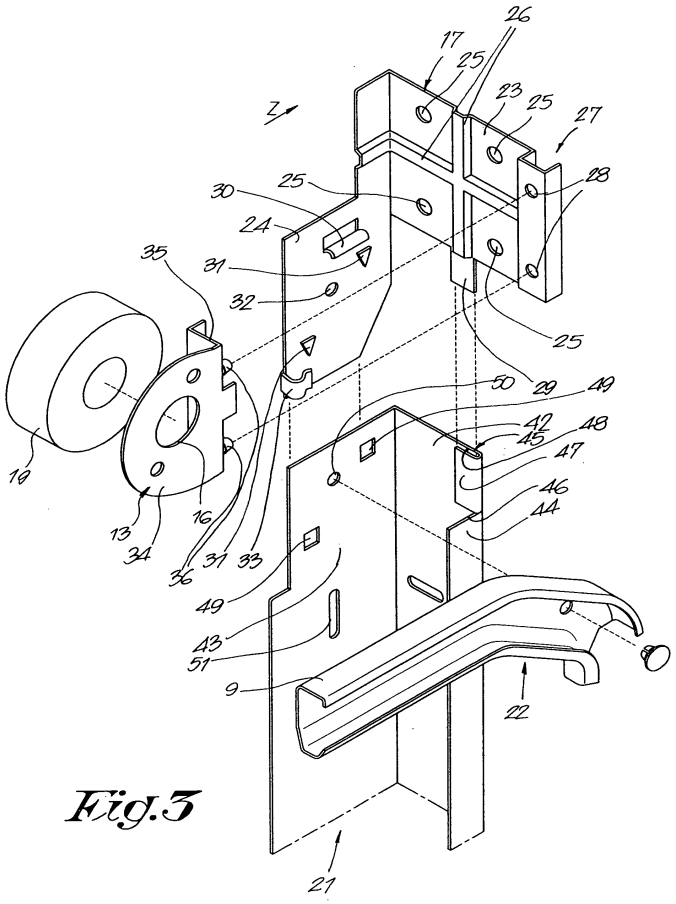

Fig.3

EP 1 818 488 A1

Description

[0001] The present invention concerns a sectional gate, more in particular a gate that is composed as an articulated wall, be it of horizontally or vertically oriented panels.

[0002] The panels of such sectional gates are mutually connected by means of articulating means which are also provided of roller means, which are meant to be guided by guide rails from a first position corresponding to the closed position of the sectional gate, to a second position corresponding to the open position of the sectional gate.

[0003] The opening and closing of the gate is usually facilitated by an electric motor and a spring system. The spring system usually comprises a spiral spring wound around a shaft and mounted on the lintel beam or the wall portion above the gate opening, and connected with the actual gate.

[0004] A problem that is known from such sectional gates is that the components of such gates are in general rather heavy and therefore, these gates are difficult to assemble and not suitable to be mounted by only one person.

[0005] In the case of a fire-resisting section gate, the panels, and as a consequence also the guiding means, the spring system and the electric motor become heavier.

[0006] It is known that, when bolts are used for mounting a sectional gate, at least two workmen are required, one for sustaining the pieces brought together while the other screws the bolts in their fixed position.

[0007] Another known sectional gate makes use of a more intelligent mounting system, whereby one component to be mounted on another component is provided of one or more hooks from which the curved or widened free end can co-operate with a hole in the second component.

[0008] This mounting system using hooks or the like gives at least a partial solution to the problem of the difficult mounting.

[0009] A problem though introduced by such mounting system comprising a hook, consists of the fact that more space is required than the volume of both components.

[0010] Indeed, the hook should be brought through the hole and afterwards, the second component comprising the hook, or the first component comprising the hole, requires a secondary displacement as for example a downward movement.

[0011] It is clear that also sidewise secondary displacements require extra space.

[0012] A partial solution may lay in the use of hooks which, once brought through a hole are moved behind a plate by mutually rotating both components. The required extra space may be less but still present.

[0013] The required extra space is often critical as for example in the case that the spring system of a sectional gate is to be mounted with such a known mounting system.

[0014] Indeed, the available height between the top of the gate opening and the ceiling of a garage is often smaller than the required height for mounting such known spring system.

[0015] The same occurs when the electric motor is to be mounted to the ceiling.

[0016] In order to solve this and other problems, the invention concerns a sectional gate comprising an articulated wall consisting of panels coupled together; at least two guide rails; driving means like for example an electric motor; a spring system which is connected with the articulated wall, whereby at least two components of the sectional gate are coupled together by means of a so called "unidirectional click-system" which makes it possible to mount at least two components by bringing them together according to a general straight line.

[0017] A first and major advantage exists in that the component to be mounted can be brought towards and against the component on which it should be mounted, and the mounting does not require a secondary displacement.

[0018] Such mounting requires thus less space and such a sectional gate can as a consequence be applied in a wider range of conditions.

[0019] Moreover, mounting such a sectional gate according to the invention is more user friendly.

[0020] According to a preferred embodiment, the unidirectional click-system comprises at least a protrusion provided on a first component, holding means for holding said protrusion provided on a second component, whereby at least the protrusion or the holding means comprise elastic locking means that can be displaced or deformed by bringing the protrusion in the holding means which displacement or deformation is elastically reversed when both components are in their final mounted position.

[0021] An advantage is that such embodiment of the mounting system allows the undoing of the mounting, i.e. the removal of the connection, more in particular by applying an external force for displacing the elastic locking means, whether or not with a special tool.

[0022] According to yet another preferred embodiment, the holding means are mainly realised as a cavity or an opening.

[0023] In order to make the mounting even more user friendly, the sectional gate can be provided of directing means which optionally can be integrated in the unidirectional click-system.

[0024] In the latter case the directing means can, according to a preferred embodiment, consist of a wide access giving out to a narrowing cavity or opening for automatically guiding the protrusion to enter the cavity.

[0025] Accordingly, also the protrusion can be made conical, i.e. thin or of reduced scale near its free end, and thicker or more robust towards its connection to the second component.

[0026] In order to better explain the characteristics of the present invention, the following preferred embodiment of a sectional gate according to the invention is described as an example without being limitative in any

way, with reference to the accompanying figures, in which:

figure 1 is a schematic and perspective view of a sectional gate according to the invention;
figure 2 represents more in detail the part as indicated with F2 in figure 1;
figure 3 is an exploded view of the portion as represented in figure 2;
figure 4 is a cross-sectional view according to line IV-IV in figure 2;
figures 5 to 8 are alternative embodiments of the part as represented in figure 4;
figure 9 represents an alternative embodiment of the portion as represented in figure 3;
figure 10 is a cross sectional view according to line X-X in figure 9;
figures 11-12 represent an alternative embodiment of the portion as represented in figure 10, respectively an unlocked and a locked position.

[0027] Figure 1 shows a sectional gate 1 composed of panels 2 which are mutually connected forming an articulated wall by means of articulating means 3 provided of roller means 4.

[0028] These roller means 4 can co-operate with guide rails 5 at both sides of the gate opening, mainly composed of U-shaped profiles, from which in figure 1 only one side is represented.

[0029] Both guide rails 5 are more in particular composed of a vertical guide rail 6 and a horizontal guide rail 7 which are interconnected by means of a curved portion 8.

[0030] In order to guarantee that the upper panel 2A is positioned in line with the other panels 2 when the sectional gate 1 is closed, the roller means 3A that are provided at the top of the upper panel 2A are guided by a separate mainly horizontal guide rail 9 which is slightly bent downwards near the gate opening.

[0031] The sectional gate 1 further comprises a spring system 10 comprising for example two spiral springs 11 wound around a tubular shaft 12, each with one end connected to the shaft 12 and with the other end connected to a fixed bearing plate 13 supporting the shaft 12.

[0032] At a distance from the gate opening, an electric motor 14 is provided, in this case fixed to the ceiling of a garage and provided of a chain 15 connected to the upper panel 2A of the sectional gate 1.

[0033] Figures 2 and 3 show more in detail how the bearing plate 13 is provided of a hole 16 through which a free end of the shaft 12 is brought.

[0034] The bearing plate 13 is connected to a mounting plate 17 which connection, according to the invention, is realised by means of a unidirectional click-system.

[0035] The mounting plate 17 is fixed by means of bolts 18 to the wall portion aside and above the gate opening.

[0036] The portion of the shaft 12 extending through the opening 16 in the bearing plate 13 is provided of a reel 19 whereon a cable 20 is wound which is connected with the lower panel 2B of the sectional gate 1.

[0037] The mounting plate 17 is interconnected with a vertical generally L-shaped profile 21 whereon the U-shaped profile of the vertical guide rail 6 is mounted.

[0038] According to the invention, the interconnection is realised with a unidirectional click-system.

[0039] The figures 2 and 3 also represent the downwardly oriented portion 22 of the second horizontal guide rail 9 near the gate opening, which is mounted on the generally L-shaped profile 21 by means of a unidirectional click-system.

[0040] The figures 2 and 3 illustrate that the mounting plate 17 is generally L-shaped and comprises a first flank 23 perpendicular to the mounting direction Z of the bolts 18, and a second flank 24 parallel to said direction Z.

[0041] The first flank 23 is provided of four holes 25 for the bolts 18, two ribs 26 for fortifying the flank 23, and a protruding end portion 27 with U-shaped cross-section wherein two holes 28 are provided.

[0042] Further, the first flank 23 is provided of a downwardly oriented projection 29.

[0043] The second flank 24 stretches out to well below the first flank 23, and is provided of a downward oriented hook 30, two protruding points 31, a hole 32 and an elastic lip 33.

[0044] The bearing plate 13 to be mounted on the mounting plate 17 is composed of a plate portion 34 wherein the hole 16 is provided and of a perpendicular thereon provided end portion 35 which form and shape is such that it can co-operate with the protruding end portion 27 of the mounting plate 17.

[0045] The end portion 35 is thereto provided of two protrusions 36 which can co-operate with the holes 28 provided in the protruding end portion 27 of the mounting plate 17.

[0046] In figure 4, one of the protrusions 36 and the co-operation with its respective hole 28 is more in detail represented.

[0047] In this embodiment, the protrusion 36 connected to the bearing plate is built up as a mainly conical portion 37 widening from its free end 38 up to its transition into a cylindrical portion 39 with a slightly smaller diameter as compared to the biggest diameter of the conical portion 37, which cylindrical portion 39 stretches out to a shoulder 40. In the conical portion 37 and the cylindrical portion 39 a groove 41 is provided that reaches up to the shoulder 40 and that provides the protrusion 36 of two flexibly movable legs.

[0048] The generally L-shaped profile 21, represented in detail in figures 1 and 2, whereon the mounting plate 17 is to be mounted, is provided of a first flank 42 and a perpendicular second flank 43.

[0049] The free end of the first flank 42 is folded such that an end portion 44 is parallely oriented to the second flank 43.

[0050] The end portion 44 is near its upper free end 45 provided of a cut 46, and an upper portion 47 of this

folded end portion 44 is further folded so that it is positioned parallel to the first flank 42 and forming a narrow space 48 in between.

[0051] The second flank 43 is provided of two square holes 49 and a round hole 50, which holes are positioned with respect to the upper portion 47 such that they can co-operate with the two protruding points 31 on the mounting plate 17, when the downwardly oriented projection 29 of the mounting plate 17 is slit in the narrow space 48.

[0052] Both flanks 42 and 43 of the generally L-shaped profile 21 are further provided of a groove 51.

[0053] The mounting of such sectional gate 1 as described above is easy and as follows.

[0054] One could start by mounting, for example screwing, the L-shaped profiles 21 to the reveals or the side walls, where the screws can be brought through the grooves 51.

[0055] The mounting plates 17 at both sides of the gate opening are mounted on the generally L-shaped profiles 21, more in particular by sliding the downwardly oriented projection 29 of the mounting plate 17 in the narrow space 48.

[0056] At the same time, the two protruding points 31 on the mounting plate 17 are moved towards the two square holes 49 and coincide therewith when the hook 30 comes in contact with the generally L-shaped profile 21.

[0057] The elastic lip 33 in the meantime co-operates with the free border of the generally L-shaped profile 21.

[0058] The round holes 32 and 50 coincide when the mounting plate 17 and is mounted on the generally L-shaped profile 21.

[0059] When the mounting plate 17 is fixed to the surrounding walls of the gate opening by applying the bolts 18, the downwardly oriented portion 22 can be connected in a next step to the profile 21, in this case by means of a unidirectional click-system similar to the protrusion 36 as described above, but where the protrusion 36 is a loose element.

[0060] Further, the bearing plates 13 are assembled with the shaft 12 whereon the spring system 10 is given the appropriate tension. The whole can now be mounted by lifting the assembled spring system 10 up to the height where the protrusions 36 are approximately in line with the openings 28. A unidirectional displacement makes it possible to mount the assembled spring system 10, more in particular by pushing the protrusions 36 through the holes 28.

[0061] Indeed, thanks to the narrow free end 38 of the conical portion 37, the so called directing means are integrated in the unidirectional click-system, the relative positioning of the bearing plates 13 with respect to the mounting plates 17 is facilitated.

[0062] Further pushing causes an elastic deformation of the conical portion 37, i.e. the legs created by the groove 41 forming the locking means are pushed together.

[0063] The dimensions of the protrusions 36 and the choice of the elastic material make it possible that such elastic deformation is reversed when the end position is reached.

[0064] Indeed, when the conical portion 37 is completely brought through an opening 28, the cylindrical portion 39 having a smaller diameter than the hole 28 and the biggest diameter of the conical portion being bigger than the diameter of the hole 28, the legs of the protrusion 36 are moved in their original position.

[0065] This unidirectional mounting is extremely easy and makes sure that the bearing plates 13 are firmly mounted on the mounting plates 17. Furthermore, such a connection can be undone by applying an external force, more in particular by squeezing a conical portion 37 and pulling back the spring system.

[0066] The mounting of a sectional gate 1 according to the invention can be continued by applying the guide rails 5, the electric motor 14, eventually provided of one or more similar unidirectional click-systems in order to make it possible for one person to mount such a sectional gate 1 according to the invention.

[0067] Further, the panels 2 are mounted by bringing the roller means 4 in the guide rails 5 and by connecting these panels 2 mutually by means of the articulating means 3.

[0068] The upper roller means 3A of the upper panel 2A are guided in the separate mainly horizontal guide rail 9 which is provided near the gate opening of the downwardly oriented portion 22.

[0069] The chain 15 is connected to the upper panel 2A and the cable 20 from the reel 19 is connected to the lower panel 2B.

[0070] It is clear that the unidirectional click-system can be realised in different manners.

[0071] In figures 5 to 8, some alternative unidirectional click-systems are represented which in each case comprises at least a protrusion 52 provided on a first component 53 and holding means 54 for holding said protrusion 52 provided on a second component 55. According to the invention, the protrusion 52 or the holding means 54 comprise elastic locking means 56 that can be displaced into an open position by bringing the protrusion 52 in the holding means 54 and that is elastically repositioned into a closed position when both components 53 and 55 are in their final mounted position.

[0072] In figure 5, the unidirectional click-system is provided of a groove 57 and of a conical free extremity 58. In this case, the holding means 54 comprise a hole 59 in the second component 55 and also the above mentioned elastic locking means 56, which in this case comprise two opposing springs 60, each acting on a ball 61 captured in a housing 62.

[0073] The balls 61 are moved aside into an open position of the holding means 54, more in particular when the conical free extremity 58 is pushed in the hole 59. When the groove 57 coincides with the balls 61, the balls 61 move back to a closed position of the holding means

54 and as a consequence, the protrusion 52 is captured and held by the holding means 54. A strong pulling force or a force pulling back the springs 60 may suffice to pull loose the first component 53 from the second component 55.

[0074] Figure 6 represents a similar unidirectional click-system which therein differs from the preceding click-system that the balls 61 are substituted by chamfered block elements 63.

[0075] As opposed to the helical springs 60 of the preceding click-systems, the click-systems as represented in figures 7 and 8 are provided of holding means 54 made as one elastically deformable element 64.

[0076] It is clear that such a protrusion 52 can be provided of two or more grooves 57, so that the components can be mounted according to at least two preferred mutual positions by simply pushing the components further in the mounting direction until the desired position is reached.

[0077] In figure 9 such an alternative connection for the bearing plate 13 on the mounting plate 17 provided of two preferred mutual positions is represented. The connection is realised by sliding the surfaces of two components on top of each other. Further pushing the two components in that mounting direction will bring them in the second desired position.

[0078] In this case and also in the unidirectional click-systems, as represented in the figures 10 to 12, it is the protrusion 52 that is provided of the above mentioned elastic locking means 56.

[0079] Also in this case, it is clear that more than one preferred final mutual position can be obtained, for example by providing two recesses in line on the bearing plate for holding the movable protrusion.

[0080] It is clear from the discussed variants that a lot of variants for the unidirectional click-systems can be identified.

[0081] It should also be clear that a lot of components of the sectional gate 1, although all are not represented in the drawings, can be mounted by means of a unidirectional click-system. Indeed, it is clear that for example also the cone which is usually mounted on the bearing plate 13, more in particular on the opposite side from the reel 19, can be mounted thereon by means of a unidirectional click-system, for example existing of protrusions comprising sideways movable flanks which can elastically be moved in the body of the protrusion.

[0082] We also mention for reasons of completeness that a connection of components by means of a unidirectional click-system can be meant for facilitating the mounting, and that, after the mounting of two components by means of such a click-system, the components are often further connected by means of for example bolts.

[0083] It is clear that a sectional gate 1 with vertical panels can also be provided of such unidirectional click-systems, and that the advantages of the unidirectional click-system are even of more importance for the heavier components of fire resistant sectional gates 1.

[0084] Of course, the a unidirectional click-system can also be applied to roller shutters for the same of similar reasons.

[0085] The present invention is by no means limited to the embodiments given as examples and can be realised according to different variants while still remaining within the scope of the invention.

Claims

1. Sectional gate (1) comprising an articulated wall consisting of panels (2) coupled together; at least two guide rails (5); driving means like for example an electric motor (14); a spring system (10) which is connected with the articulated wall, **characterised in that** at least two components, a first component (13,53) and a second component (17,55), of the sectional gate (1) are coupled together by means of a so called "unidirectional click-system" which makes it possible to mount at least two components (53,55) by bringing them together according to a general straight line.

2. Sectional gate (1) according to claim 1, **characterised in that** it comprises mounting plates (17) to which the spring system (10) can be mounted, eventually provided of bearing plates (13), and **in that** the connection between the mounting plate (17) and the springs system (10) is realised by means of a unidirectional click-system.

3. Sectional gate (1) according to claim 1, **characterised in that** the electric motor (14) or the driving means in general are provided of a unidirectional click-system.

4. Sectional gate (1) according to claim 1, **characterised in that** it comprises a generally L-shaped profile (21) whereon a U-shaped profile of a vertical guide rail (6) is mounted, and **in that** the connection between the U-shaped profile and the generally L-shaped profile (21) is realised by means of a unidirectional click-system.

5. Sectional gate (1) according to one or more of the preceding claims, **characterised in that** a unidirectional click-system comprises at least a protrusion (36,52) provided on a first component (13,53); holding means (28,54) for holding said protrusion (36,52) provided on a second component (17,55), whereby at least the protrusion (36,52) or the holding means (28,54) comprise elastic locking means (37,56) that can be displaced or deformed by bringing the protrusion (36,52) in the holding means (28,54) which displacement or deformation is elastically reversed when both components (53,55) are in their final

mounted position.

6. Sectional gate (1) according to claim 5, **characterised in that** the protrusion (36,52) is provided of at least one groove (57) that can co-operate with the holding means (54).

7. Sectional gate (1) according to claim 5, **characterised in that** the elastic locking means (37,56) comprise springs (60) or **in that** the elastic locking means (37,56) are made of an elastic deformable material.

8. Sectional gate (1) according to claim 1 or 5, **characterised in that** the unidirectional click-system is provided of directing means.

9. Sectional gate (1) according to claim 8, **characterised in that** the directing means comprise a wide access giving out to a narrowing cavity or opening, or a conical free end (58) of a protrusion (52), for facilitating the entry of the protrusion (52) in the cavity or opening (28,59).

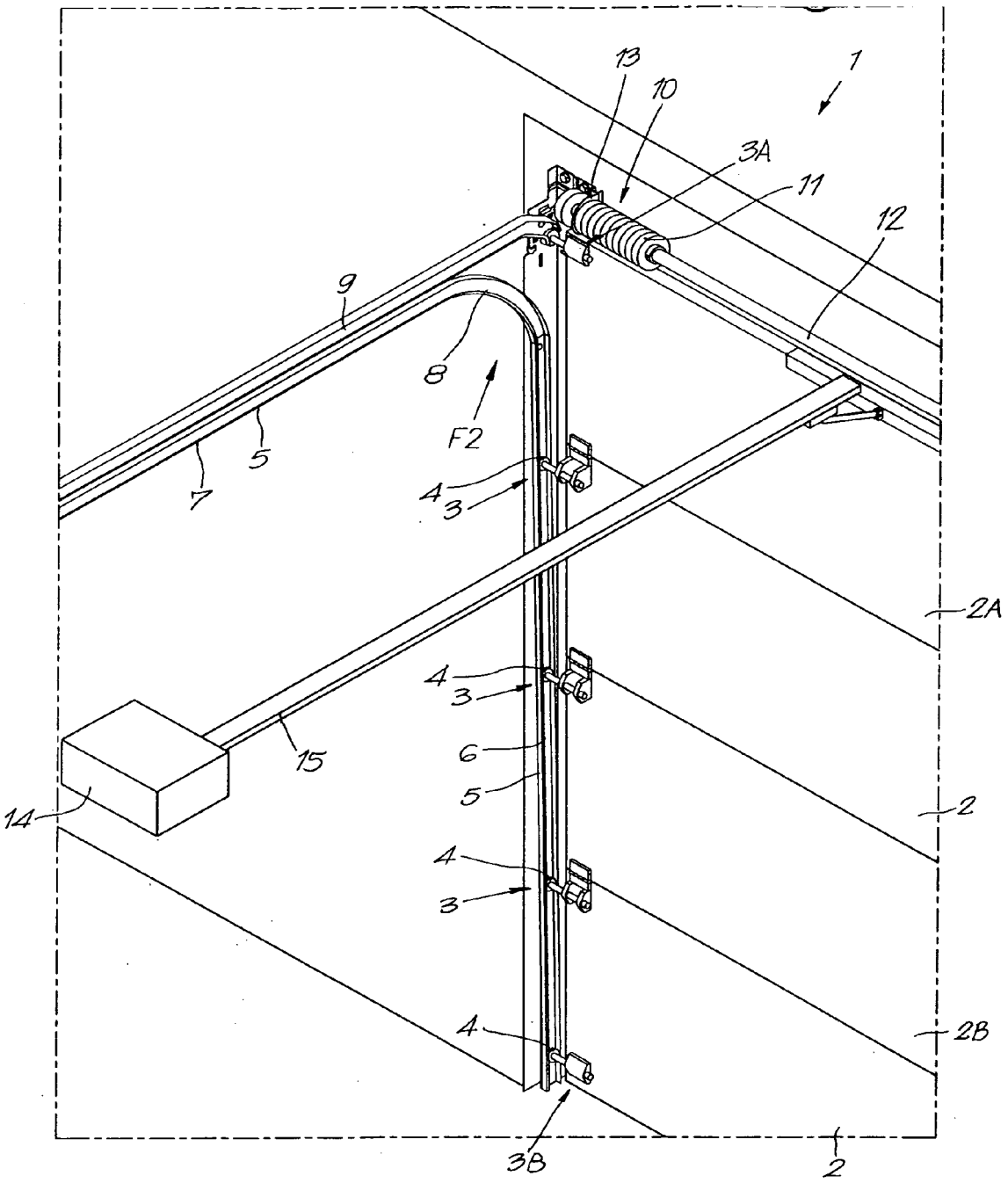

Fig. 1

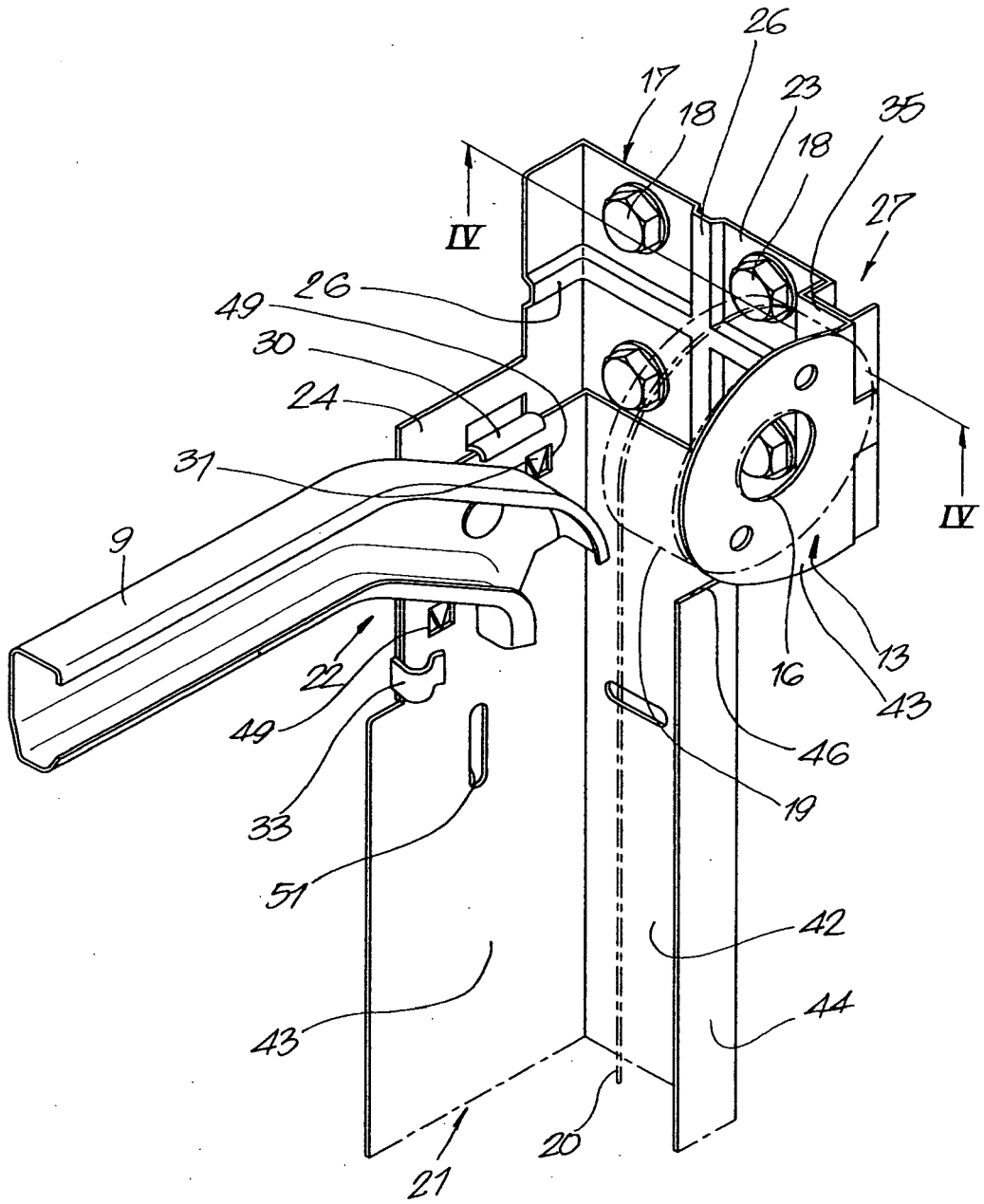
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Fig.2

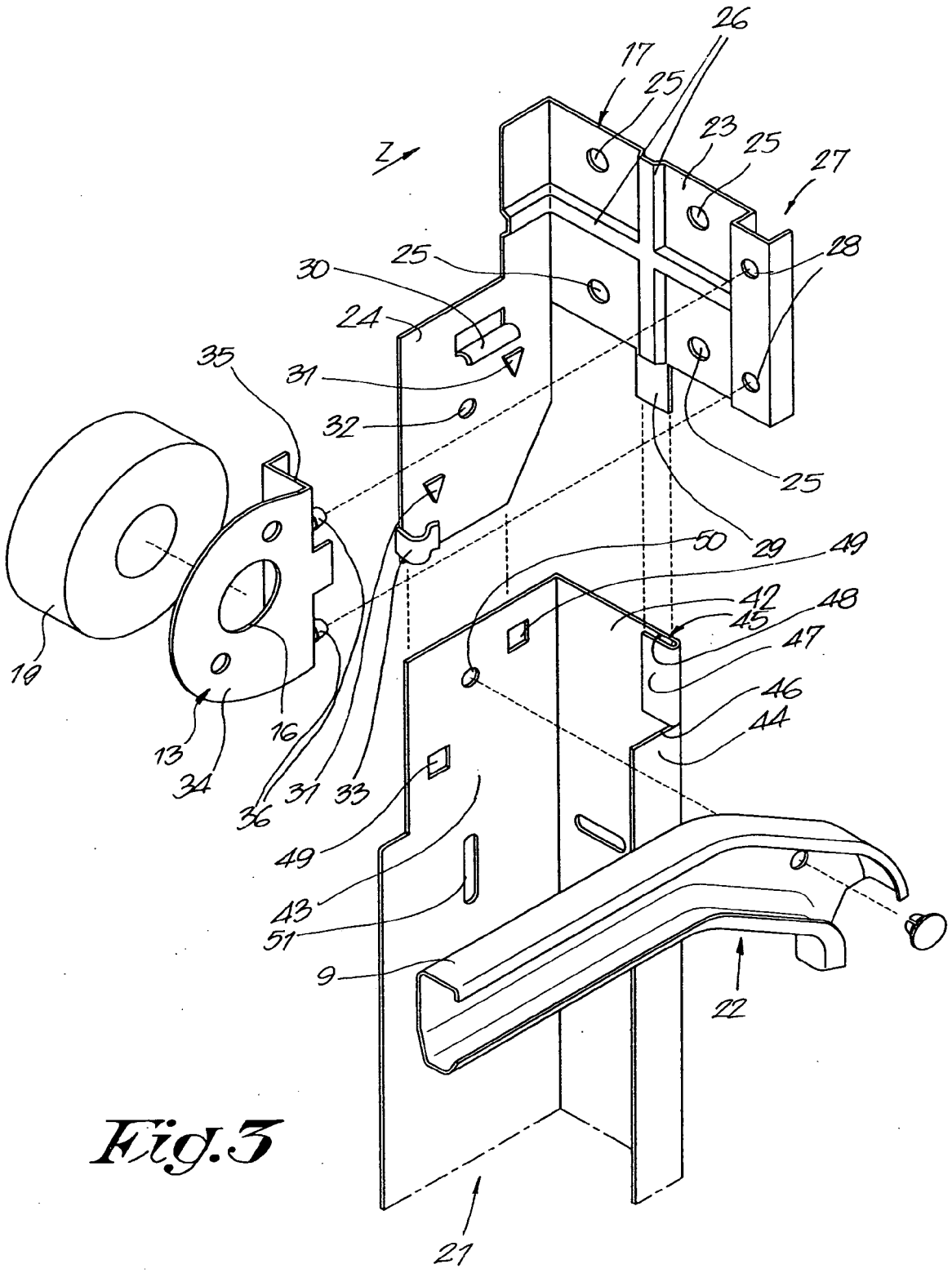
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Fig.3

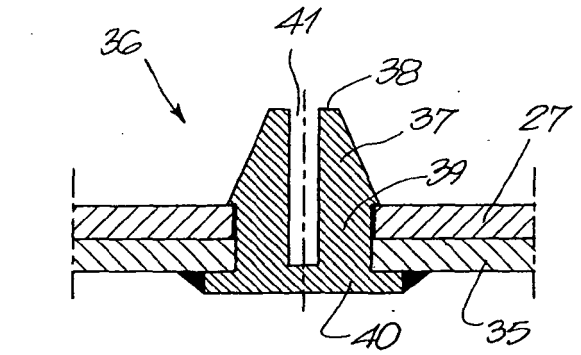

Fig.4

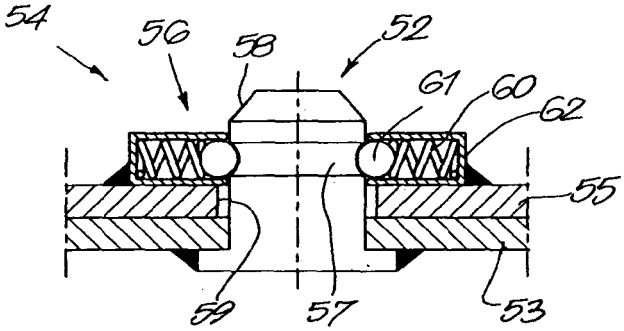

Fig.5

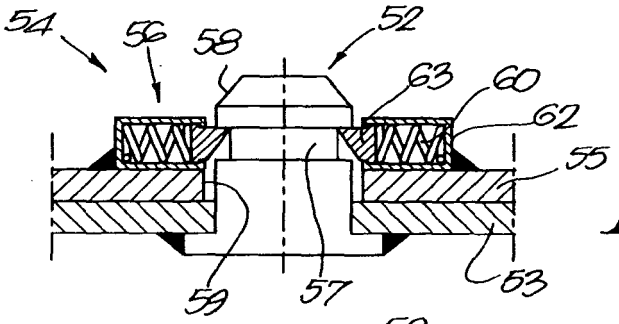

Fig.6

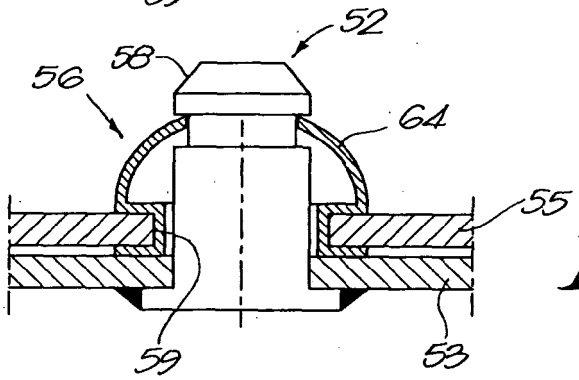

Fig.7

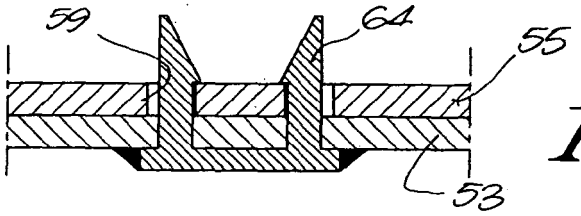

Fig.8

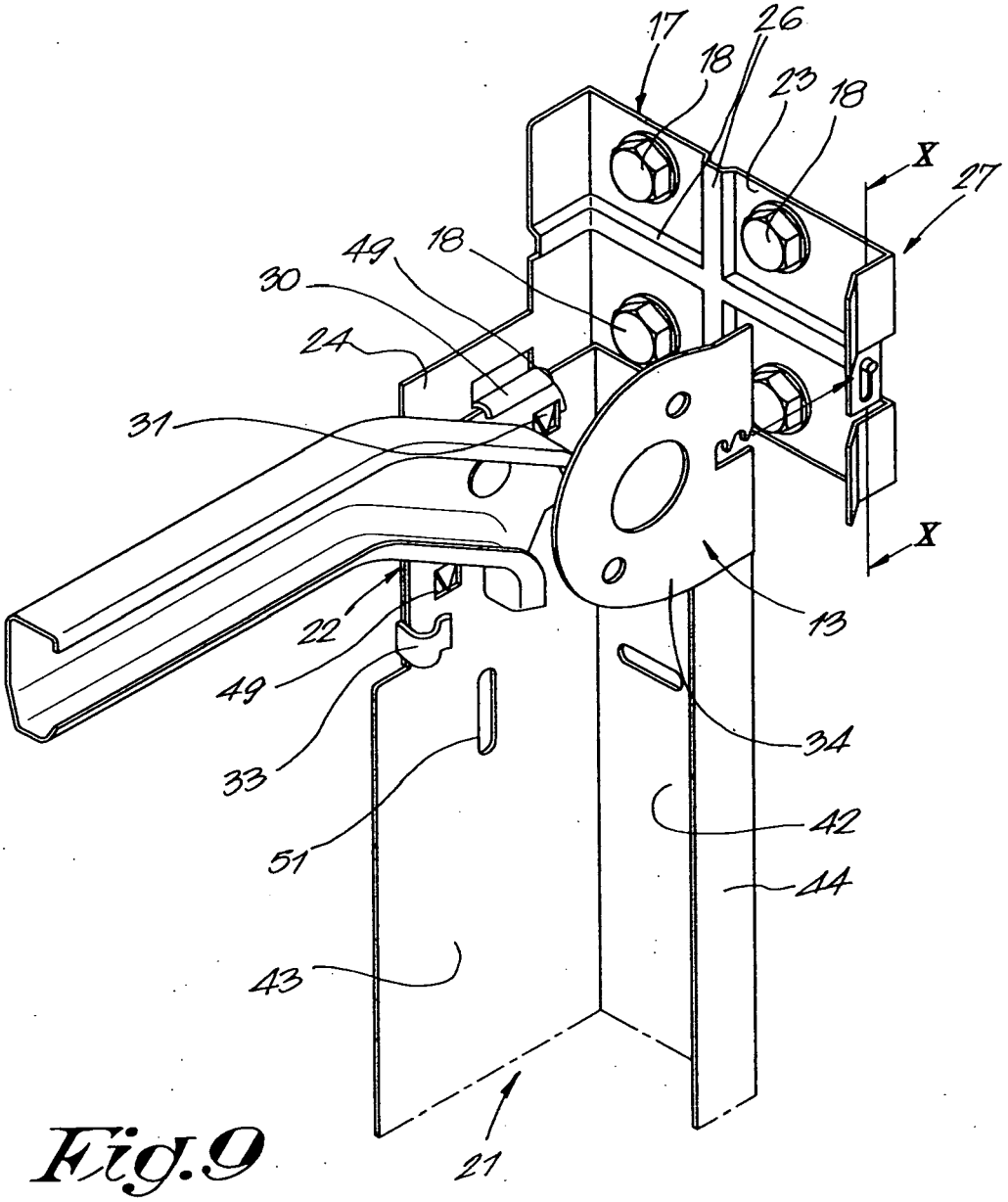

Fig.9

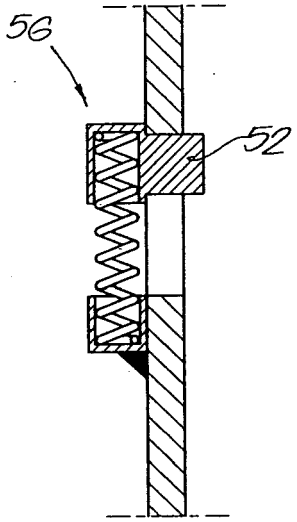

Fig.10

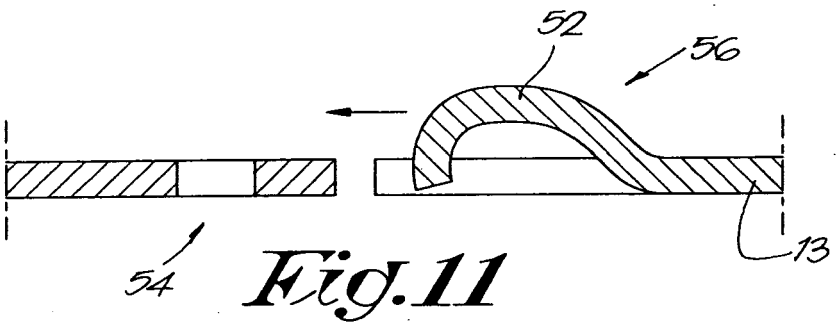

Fig.11

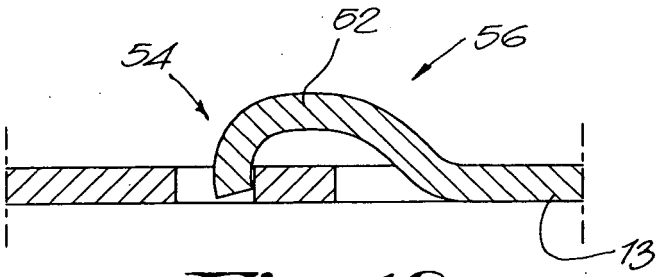

Fig.12

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 07 5302

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	US 5 964 268 A (CARPER ET AL) 12 October 1999 (1999-10-12) * column 6, line 30 - line 49 * * column 11, line 60 - column 12, line 6 * * column 12, line 58 - column 13, line 17 * * figures *	1,2,8,9	INV. E05D15/24
X	WO 94/16184 A (ROBERT BOSCH GMBH; KAISER, NORBERT; SIEGWART, BERNHARD; GRABANDT, PETE) 21 July 1994 (1994-07-21) * page 4, paragraph 3 - page 5, paragraph 3 * * figures 1-4 *	1,3,5, 7-9	
X	US 5 446 956 A (HESS ET AL) 5 September 1995 (1995-09-05) * column 2, line 15 - line 31 * * figures 1-3 *	1,4	
X A	US 6 540 003 B1 (MARTIN DAVID O) 1 April 2003 (2003-04-01) * column 7, line 40 - line 57 * * figure 4 *	1,5,6,8, 9	TECHNICAL FIELDS SEARCHED (IPC) E05D E05F
X	US 5 615 723 A (CARPER ET AL) 1 April 1997 (1997-04-01) * column 8, line 36 - line 58 * * figure 13 *	1,5,7	
X	US 2002/056528 A1 (WHITLEY L. BLAKE) 16 May 2002 (2002-05-16) * paragraph [0056] - paragraph [0062] * * figures 9-16 *	1,5,7-9	
A	DE 200 00 420 U1 (AUTOMATIK-TUER-SYSTEME GMBH) 22 February 2001 (2001-02-22) * page 6, last paragraph * * figure 3 *	3	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 July 2006	Van Kessel, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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O : non-written disclosure
P : intermediate document

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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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28-07-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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
WO 9416184 A	21-07-1994	DE 9300400 U1	25-02-1993
		EP 0686225 A1	13-12-1995
US 5446956 A	05-09-1995	NONE	
US 6540003 B1	01-04-2003	AU 6034499 A	03-04-2000
		EP 1119677 A1	01-08-2001
		TR 200101363 T2	21-08-2001
		WO 0015936 A1	23-03-2000
US 5615723 A	01-04-1997	NONE	
US 2002056528 A1	16-05-2002	AT 300656 T	15-08-2005
		CA 2344964 A1	15-11-2001
		DE 60112174 D1	01-09-2005
		DE 60112174 T2	29-12-2005
		EP 1158133 A2	28-11-2001
		ES 2242674 T3	16-11-2005
		JP 3592254 B2	24-11-2004
		JP 2002054367 A	20-02-2002
		JP 2004332525 A	25-11-2004
		US 6328091 B1	11-12-2001
DE 20000420 U1	22-02-2001	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82