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(54) **Guide means for sliding doors**

(57) Guide for doors, in particular sectional doors, comprising a first guide means for guiding a first section of a door between a first (e.g. opened) position and a second (e.g. closed) position having a substantially linear first section followed by a curved section turning into a

substantially linear second section, which is inclined with respect to the first section, and a guide means for separately guiding a second section of a door between said first and second positions, wherein said second guide means is formed sectionally having at least a forward guide element and a rearward guide element.

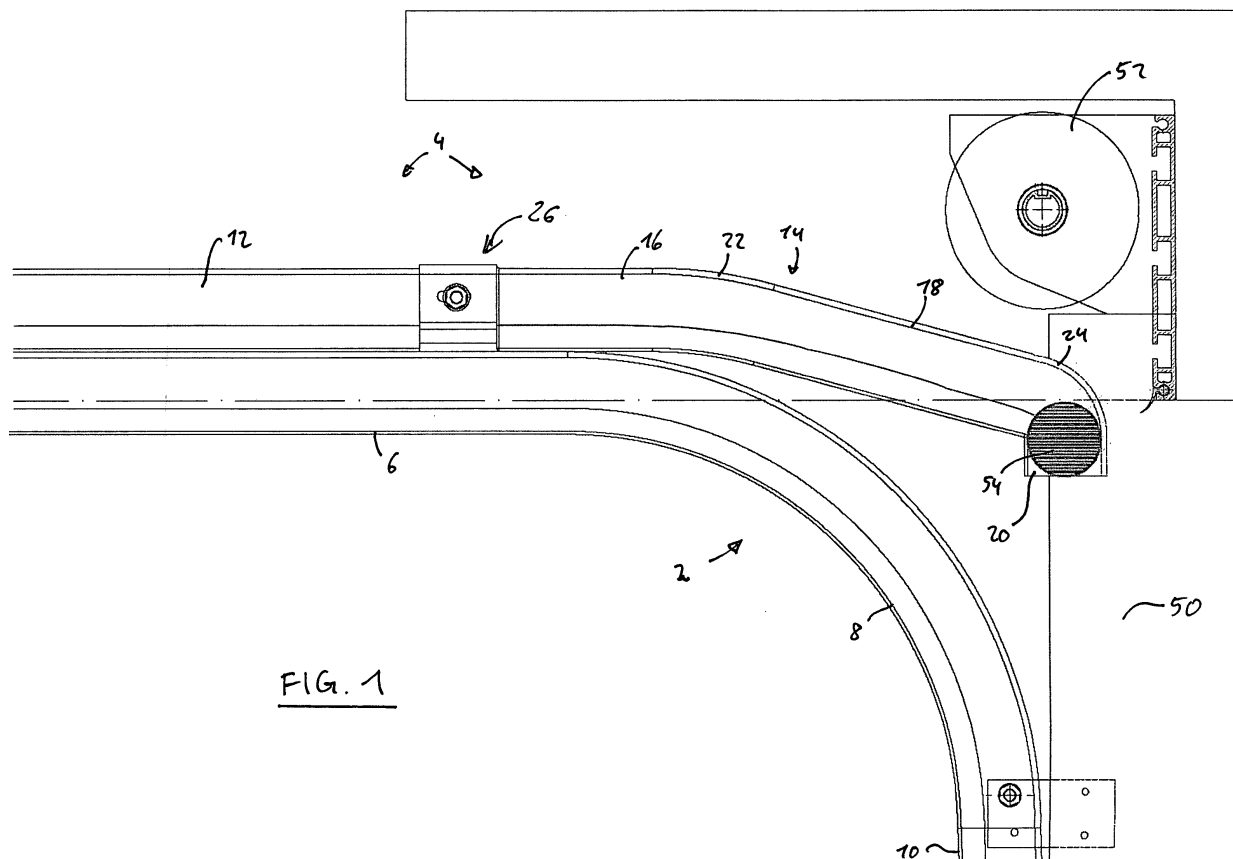


FIG. 1

Description

[0001] The present invention relates to a guide for doors, in particular sectional doors, as well as to a door, in particular a sectional door, having a guide means for guiding the door panel(s) during displacement.

[0002] Guide for doors and the respective doors are known from the state of the art. For example, there are guide for doors known in the state of the art, which consists of a first guide means for guiding a first section of a door panel and a second guide means for separately guiding a second section of the door panel during displacement of the door. Generally, the first and second guide means are built by rail-like elements.

[0003] However, these first and second guide means from the state of the art are complicated to manufacture due to their geometric configuration.

[0004] Accordingly, it is an object of the present invention to provide a guide for doors, in particular sectional doors, as well as a door, in particular a sectional door, which has an improved geometric configuration, so that the effort for manufacture and assembly of the door is decreased.

[0005] This object is achieved by a guide for doors, in particular sectional doors, having the features disclosed in claim 1 and by a door, in particular a sectional door, having the features disclosed in claim 10. Preferred embodiments are subject of the dependent subclaims.

[0006] According to the invention, a guide for doors, in particular sectional doors, is provided, comprising a first guide means for guiding a first section of a door between a first (e.g. opened) position and a second (e.g. closed) position having a substantially linear first section followed by a curved section turning into a substantially linear second section, which is inclined with respect to the first section, and a guide means for separately guiding a second section of a door between said first and second positions, wherein said second guide means is formed sectionally having at least a forward guide element and a rearward guide element. First and second guide means may be provided to guide a single door panel of the door. However, the guide means may be provided for guiding a plurality of door panels of a sectional door, wherein the first guide means is generally adapted to guide all door panels except one section of the last door panel, which is guided by the second guide means. Advantageously, the substantially linear second section of the first guide means is adapted to be arranged substantially parallel to a door opening plane, whereas the substantially linear first section of the first guide means is arranged substantially perpendicular to the door opening plane. Consequently, first and second guide means form different displacement paths for the respective panel sections. The second guide means consists advantageously of several parts, i.e. is formed sectionalised. In other words, the second guide means has a composite structure formed of at least two elements, namely the forward guide element and the rearward guide element. That is, the guiding

function is preferably performed by two separate parts, i.e. the rearward and the forward guide element. As the parts of the second guide means, which provide the guiding function, are formed as two separate parts, a second guide means is provided, which can be easily manufactured and mounted even in case a complicated geometric configuration of the second guide means is needed.

[0007] Preferably, said forward guide element of said second guide means comprises a substantially linear first forward guide section and a second forward guide section inclined with respect to said first forward guide section. The second forward guide section may also comprise a substantially linear geometric configuration. In order to ensure a smooth transition between the first forward guide section and the second forward guide section, an intermediate curved section may be provided between the first and second forward guide sections. The radius of the intermediate curved section is preferably equal or greater than the radius of the curved section of the first guide means. The angle of inclination between the first forward guide section and the second forward guide section may be preferably in the range between 100 to 175°, most preferably between 130 to 170°.

[0008] In a further preferred embodiment, said forward guide element of said second guide means, comprises a third forward guide section following said second forward guide section and being inclined with respect to said first and/or second forward guide section. Advantageously, the third forward guide section is at least partially substantially linear. Similar to the transition between the first and second forward guide section, an intermediate curved section may be also provided between the second and third forward guide section in order to ensure a smooth transition. This intermediate curved section may have a smooth curved radius at the outer perimeter thereof and a sharp corner at the inner perimeter thereof. The third forward guide section is preferably inclined with respect to the first and second forward guide section, wherein in a most advantageous embodiment, the third forward guide section is arranged substantially perpendicular to the direction of the first forward guide section. In other words, the third forward guide section may be arrangeable substantially parallel to a door opening plane of a door.

[0009] Advantageously, said forward guide section of said forward guide element and said second section of said first guide means are oriented substantially in the same direction. That is, the third forward guide section of the forward guide element and the second section of the first guide means may be substantially in alignment, i.e. aligned. Advantageously, the third forward guide section and the second section may not only be oriented substantially in the same direction, but also arranged in the same plane.

[0010] In a yet further preferred embodiment, said rearward guide element of said second guide means is substantially linear. Advantageously, the rearward guide element is adapted to be arranged in an orientation sub-

stantially perpendicular to a door opening plane.

[0011] In a still further preferred embodiment, said rearward guide element of said second guide means and said first section of said first guide means are oriented substantially in the same direction and preferably arranged in a side-by-side relationship. In other words, the direction of the rearward guide element and the first section of the first guide means is aligned, and most preferably arranged in one plane. Therefore, the rearward guide element and the first section of the first guide means are advantageously arranged adjoining or adjacent to each other, in particular contacting each other, so that the rearward guide element and the first section of the first guide means forms a double rail.

[0012] Advantageously, said first and second guide means are formed as guide rails. These guide rails may have any given cross-sectional configuration, but are - however - advantageously in their cross-sectional shape formed as an U or similar configuration.

[0013] Still further preferably, said forward guide element and said rearward guide element are mounted or attached to each other by mounting means. These mounting means could be for example screws, bolts, rivets or any other kind of mechanical mounting means. Advantageously, the forward guide element and the rearward guide element are reversibly mounted, i.e. are detachably from each other by e.g. mounting means in the form of screws.

[0014] In a still further preferred embodiment, said forward guide element comprises a mounting flange for mounting said forward guide element to said rearward guide element. The mounting flange may be formed in its cross-sectional configuration in the form of an U or L. Advantageously, the forward guide element and the rearward guide element are overlapping at least partially in the area of the mounting flange. The forward guide element may be provided with an elongated hole at the mounting flange, so that the degree of overlap between the forward guide element and the rearward guide element may be adjusted. Advantageously, the mounting flange of the forward guide element is provided adjacent the first forward guide section, i.e. provided at the distal end of the first forward guide section. Further advantageously, the flange may be provided with a stepped portion, so that the inner walls of the forward and rearward guide elements are aligned in order to ensure a smooth transition between the forward guide element and the rearward guide element, since the flange of the step is preferably dimensioned to the thickness of the wall of the forward and rearward guide elements.

[0015] Further, according to the invention, a door, in particular sectional door, is provided, comprising at least one door panel, which is displaceable between a first position (such as an opened position) and a second position (such as a closed position) of the door, a first guide means for guiding a first section of said door panel having a substantially linear first section followed by a curved section turning into a substantially linear second section,

which is inclined with respect to said first section, and a second guide means for separately guiding a second section of said door panel between said opened and closed positions, wherein said second guide means is formed sectionally having at least a forward guide element and a rearward guide element. The door is preferably a sectional door, which can be formed of a plurality of generally horizontally extending sections or panels, each of which typically extends from one side of the door opening to the other side. The top section of each panel is attached to a lower section of an adjacent panel, wherein the attachment is provided preferably by means of hinges or the like. Additional sections can be mounted thereto in the same manner. Consequently, first and second guide means form different displacement paths for the respective panel first and second sections of the door panel. The second guide means consists advantageously of several parts, i.e. is formed sectionalised. In other words, the second guide means has a composite structure formed of at least two elements, namely the forward guide element and the rearward guide element. That is, the guiding function is preferably performed by two separate parts, i.e. the rearward and the forward guide element. As the parts of the second guide means, which provide the guiding function, are formed as two separate parts, a second guide means is provided, which can be easily manufactured and mounted even in case a complicated geometric configuration of the second guide means is needed.

[0016] Obviously, the further features and advantages of the inventive guide for doors can be also applied to the inventive door.

[0017] Preferably, said forward guide element of said second guide means comprises a substantially linear first forward guide section and a second forward guide section preferably inclined with respect to said first forward guide section. The second forward guide section may also comprise a substantially linear geometric configuration. In order to ensure a smooth transition between the first forward guide section and the second forward guide section, an intermediate curved section may be provided between the first and second forward guide sections. The radius of the intermediate curved section is preferably equal or greater than the radius of the curved section of the first guide means. The angle of inclination between the first forward guide section and the second forward guide section may be preferably in the range between 100 to 175°, most preferably between 130 to 170°.

[0018] In a further preferred embodiment, said forward guide element of said second guide means, comprises a third forward guide section following said second forward guide section, preferably being inclined with respect to said first and/or second forward guide section. Advantageously, the third forward guide section is at least partially substantially linear. Similar to the transition between the first and second forward guide section, an intermediate curved section may be also provided between the

second and third forward guide section in order to ensure a smooth transition. This intermediate curved section may have a smooth curved radius at the outer perimeter thereof and a sharp corner at the inner perimeter thereof. The third forward guide section is preferably inclined with respect to the first and second forward guide section, wherein in a most advantageous embodiment, the third forward guide section is arranged substantially perpendicular to the direction of the first forward guide section. In other words, the third forward guide section may be arrangeable substantially parallel to a door opening plane of a door.

[0019] In a yet further preferred embodiment, said third forward guide section is arranged substantially parallel to a door opening plane. In a door of the overhead type, the third forward guide section is therefore arranged substantially vertical. By such a configuration, displacement of the door panel guided in the third forward guide section of the forward guide element in a direction substantially perpendicular to the door opening plane is prevented. In a closed condition of a door of the overhead type, it is therefore not possible to displace the uppermost panel in a substantially horizontal direction, i. e. in a direction substantially perpendicular to the door opening plane or to the inner side of the building structure.

[0020] These and other objects, features and advantages of the present invention will become more apparent upon reading of the following detailed description of preferred embodiments and accompanying drawings. It should be understood that even though embodiments are separately described, single features thereof may be combined to additional embodiments.

Fig. 1 is an enlarged cross-sectional view of the door according to one embodiment of the invention.

Fig. 2 is a plan view of a second guide means of a guide according to one embodiment of the invention with additional two cross section views along the lines A-A and B-B.

[0021] Fig. 1 shows a plan view of an enlarged section of the guide for doors according to an embodiment of the present invention. The guide comprises preferably first guide means 2 and second guide means 4 for guiding at least one panel 50. For displacing the panels 50, a driving means is provided, which comprises a door drive shaft 52.

[0022] The door comprises of at least one panel 50 for at least partially closing a door opening of e.g. a building structure. By use of the door as a sectional door, a plurality of panels 50 are provided, which are arranged in an edge-to-edge relationship, hingedly connected by means of hinges or the like. However, the door may also comprise solely one single panel 50, which preferably entirely covers or closes the door opening of the building structure. The sectional door may be used as a folding door, in which the door opening is opened and closed by

a substantially horizontal movement of the door, i.e. of the door panels 50. However, preferably, the sectional door may be employed in door systems of the overhead-type. In these doors, the panels 50 are displaced from a substantially vertical position (i.e. arranged in the door opening) to an inclined or bent position, preferably to a substantially horizontal position (i.e. a plane substantially perpendicular to the door opening). However, the invention may be also employed in roll-up doors, in which a plurality of panels is - in the open state of the door - at least partly wound up on e.g. a shaft. This shaft could also function as the door drive shaft 52. These doors systems are typically employed in garages, industrial building structures or the like.

[0023] The panels 50 may be formed of wood or the like. Preferably, the panels 50 may be formed of at least two sheet metal or plastic shells. Between these two sheets metal or plastic shells, an insulation material may be provided (e.g. PU-foam). Thereby, the panels 50 have a reduced weight while having an improved strength. Moreover, the panels 50 could be also reinforced, so that a high stability thereof can be ensured. The sheet metal or plastic shells may be of identical design or shape, thereby simplifying their manufacture. Thus, a symmetrical panel 50 is preferably provided. The connection between the sheet metal or plastic shells may be achieved by means of a snap connection or other kinds of mechanical connection.

[0024] The door comprises guided elements 54 for guiding the panels 50 during the displacement between a first position (such as an opened-position) and a second position (such as a closed-position) of the door. The guided element 54 can be formed as a sliding element or as a rotatable element, such as a roller. Consequently, the guided element 54 is adapted to translate or move in the first and second guide means 2, 4, which might be formed as a rail element. The guide means 2,4 are preferably adapted to at least partially encapsulate the guiding element in order to prevent displacement of the panels 50 in a planned substantially normal or perpendicular to the displacement path of the panels (cf. to cross-sectional shape B-B in Fig. 2). This is achieved by an inner configuration of the first and second guide means 2,4, which is substantially adapted to the outer configuration of the guided elements 54. By use of the door as an overhead-type door, the first guide means 2 extend from a vertical position over a bent position to a horizontal position.

[0025] Thus, the first guide means 2 comprises at least a first section 6, which is blending into a curved section 8. The curved section 8 is blending or terminating in a substantially linear second section 10. Advantageously, the second section 10 is arranged substantially parallel to a door opening plane, whereas the first section 6 is arranged substantially perpendicular to the door opening plane, so that the first section 6 is basically oriented perpendicular to the second section 10. However, it is noted, that the first section 6 and the second section 10 may be inclined with respect to each other with an angle different

from 90°. In case the guide for doors is used for doors of the overhead-type, the first section 6 is arranged substantially horizontally, whereas the second section 10 is arranged substantially vertically, since the door opening plane is substantially vertically arranged. The first guide means 2 and the second guide means 4 may be formed as guide rails. These guide rails may have a cross sectional shape as shown in fig. 2, i.e. in the form of a substantially U. Advantageously, the cross-sectional shape of the first guide means 2 and the cross-sectional shape of the second guide means 4 is identical, however, may be also formed different.

[0026] The second guide means 4 is formed sectionally, i.e. consists of several parts, so that the second guide means 4 may be also referred to as multipart or composite structure. The second guide means 4 having a guiding function for guiding an upper, preferably the uppermost guided element 54 of a door panel structure. The guiding function is advantageously performed by two separate parts, namely a rearward guide element 12 and a forward guide element 14. The rearward guide element 12 is preferably substantially linear shaped and oriented substantially in the same direction as or substantially parallel to the first section 6 of the first guide means 2. Therefore, the rearward guide element 12 and the first section 6 basically form the geometric configuration of a double rail.

[0027] The forward guide element 14 will be explained in more detailed reference to Fig. 2. The forward guide element 14 comprises at least a substantially linear first forward guide section 16 and a second forward guide section 18. The second forward guide section 18 is advantageously inclined with respect to the first forward guide section 16, wherein the angle of inclination α is preferably between about 110° to about 175°. Further, the second guide 14 comprises a third forward guide section 20, which follows the second forward guide section 18 and defines a distal end of the second guide means 4. The third forward guide section 20 is advantageously inclined with respect to the first forward guide section 16. Most advantageously, the inclination of the third forward guide section 20 defines a substantially 90° angle with respect to the first forward guide section 16, so that the orientation of the third forward guide section 20 is basically parallel to a door opening plane. In other words, it is advantageously, that the third forward guide section 20 is oriented in the substantially same direction as the second section 10 of the first guide means 2. By such a configuration, displacement of the door panel 50 guided in the third forward guide section 20 of the forward guide element 14 in a direction substantially perpendicular to the door opening plane is prevented. In a closed condition of a door of the overhead type, it is therefore not possible to displace the uppermost panel 50 in a substantially horizontal direction, i. e. in a direction substantially perpendicular to the door opening plane or to the inner side of the building structure. For a smooth transition between the first, second and third forward guide sections 16, 18,

20, intermediate curved sections 22, 24 may be provided. The intermediate curved section 24 being arranged between the second forward guide section 18 and the third forward guide section 20 has advantageously a smooth curved outer perimeter and a inner sharp corner at the inner perimeter.

[0028] On the opposing distal end, i.e. adjacent the first forward guide section 16, a mounting flange 26 is provided. The mounting flange 26 is utilized for mounting the forward guide element 14 to the rearward guide element 12. The mounting flange 26 may be also formed as a plug-in mounting means for receiving the distal end of the rearward guide element 12. Advantageously, the rearward guide element 12 and the mounting flange 26 overlap a predetermined degree or amount, wherein the degree of overlap can be adjusted by means of an elongated hole 28 being preferably provided in the mounting flange 26.

[0029] As can be seen from the cross-sectional view along the line A-A in Fig. 2, the mounting flange 26 has a cross sectional shape in the form of an L. The mounting flange 26 is arranged at the forward guide element 14 in that way that the mounting flange 26 defines a stepped portion 30 for housing the rearward guide element 12. The stepped portion 30 may also function as an abutment for the distal end of the rearward guide element 12. Further, advantageously, a smooth transition without any step is provided between the rearward guide element 12 and the forward guide element 14, i.e. the inner walls of the forward and rearward guide elements 12, 14 are aligned. Preferably, the mounting flange 26 having a cross sectional shape in the form of an L, wherein one of the legs of the L is shorter than the associated leg portion of the respective rearward guide element 12.

List of reference numerals

[0030]

2	first guide means
4	second guide means
6	first section
8	curved section
10	second section
12	rearward guide element
14	forward guide element
16	first forward guide section
18	second forward guide section
20	third forward guide section
22	intermediate curved section
24	intermediate curved section
26	mounting flange
28	elongated hole
30	stepped portion
50	panel
52	drive shaft
54	guide element
α	angle of inclination

Claims

1. Guide for doors, in particular sectional doors, comprising
a first guide means (2) for guiding a first section of
a door between a first position, such as an opened
position, and a second position, such as a closed
position, having a substantially linear first section (6)
blending into a curved section (8) terminating in a
substantially linear second section (10), which is in-
clined with respect to the first section (6), and
a second guide means (4) for separately guiding a
second section of a door between said first and sec-
ond positions,
wherein said second guide means (4) is formed sec-
tionally having at least a separate forward guide el-
ement (14) and a separate rearward guide element
(12). 5
2. Guide according to claim 1, wherein said forward
guide element (14) of said second guide means (4)
comprises a substantially linear first forward guide
section (16) and a second forward guide section (18)
inclined with respect to said first forward guide sec-
tion (16). 10
3. Guide according to claim 2, wherein said forward
guide element (14) of said second guide means (4)
comprises a third forward guide section (20) follow-
ing said second forward guide section (18) and being
inclined with respect to said first (16) and/or second
(18) forward guide section. 15
4. Guide according to claim 3, wherein said third for-
ward guide section (20) of said forward guide ele-
ment (14) and said second section (10) of said first
guide means (2) are oriented substantially in the
same direction. 20
5. Guide according to one of the preceding claims,
wherein said rearward guide element (12) of said
second guide means (4) is substantially linear. 25
6. Guide according to one of the preceding claims,
wherein said rearward guide element (12) of said
second guide means (4) and said first section (6) of
said first guide means (2) are oriented substantially
in the same direction and preferably arranged in a
side by side relationship. 30
7. Guide according to one of the preceding claims,
wherein said first (2) and second (4) guide means
are formed as guide rails. 35
8. Guide according to one of the preceding claims,
wherein said forward guide element (14) and said
rearward guide element (12) are reversibly mounted
to each other by mounting means. 40
9. Guide according to one of the preceding claims,
wherein said forward guide element (14) comprises
a mounting flange (26) for mounting said forward
guide element (14) to said rearward guide element
(12). 45
10. Door, in particular sectional door, comprising
at least one door panel (50), which is displaceable
between a first position, such as an opened position,
and a second position, such as a closed position, of
the door
a first guide means (2) for guiding a first section of
said door panel (50) having a substantially linear first
section (6) followed by a curved section (8) turning
into a substantially linear second section (10), which
is inclined with respect to said first section (6), and
a second guide means (4) for separately guiding a
second section of said door panel between said first
and second positions,
wherein said second guide means (4) is formed sec-
tionally having at least a separate forward guide el-
ement (14) and a separate rearward guide element
(12). 50
11. Door according to claim 10, wherein said forward
guide element (14) of said second guide means (4)
comprises a substantially linear first forward guide
section (16) and a second forward guide section (18)
inclined with respect to said first forward guide sec-
tion (16). 55
12. Door according to claim 11, wherein said forward
guide element (14) of said second guide means (4)
comprises a third forward guide section (20) follow-
ing said second forward guide section (18), prefer-
ably being inclined with respect to said first (16)
and/or second (18) forward guide section.
13. Door according to claim 12, wherein said third for-
ward guide section (20) is arranged substantially par-
allel to a door opening plane.

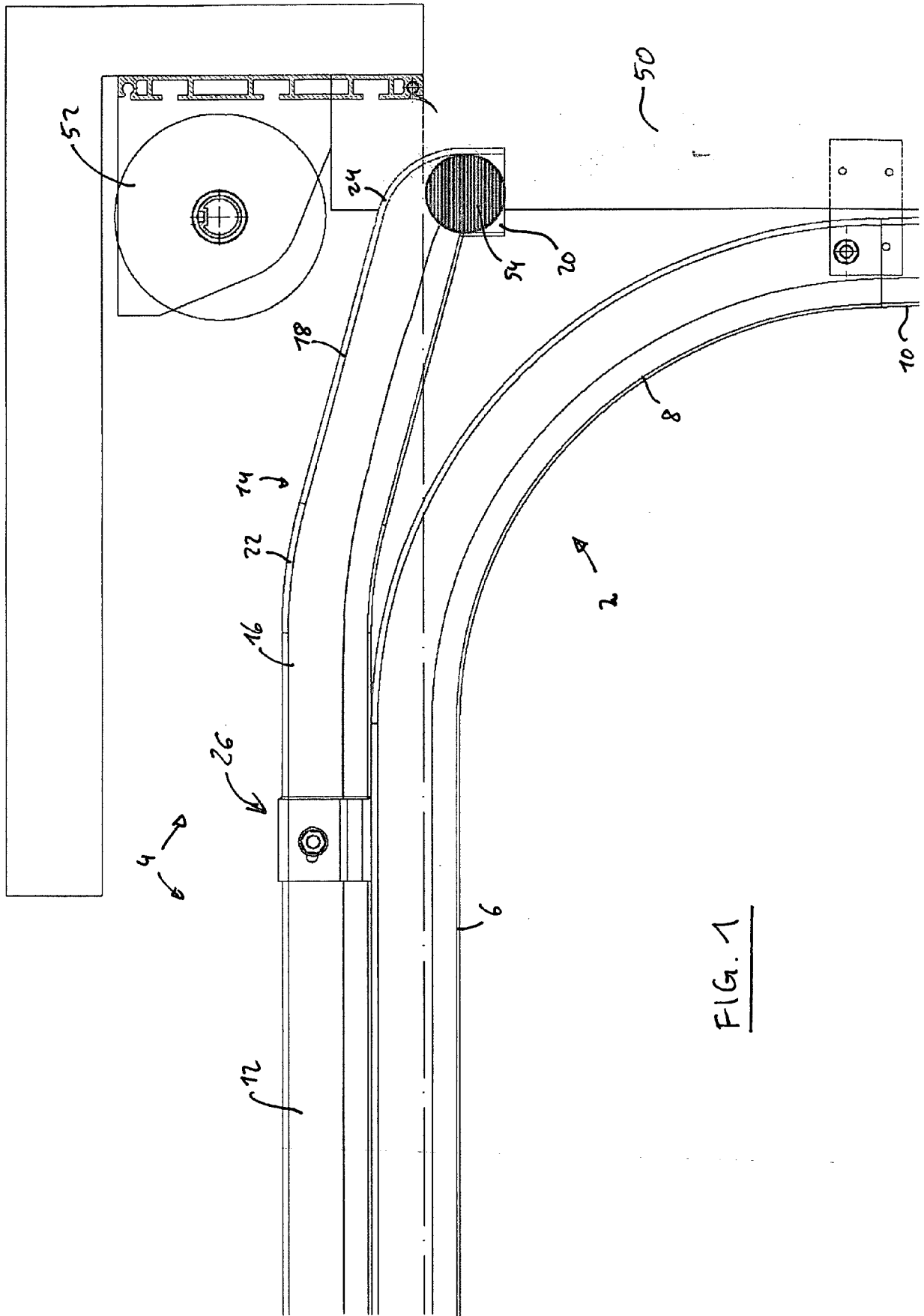
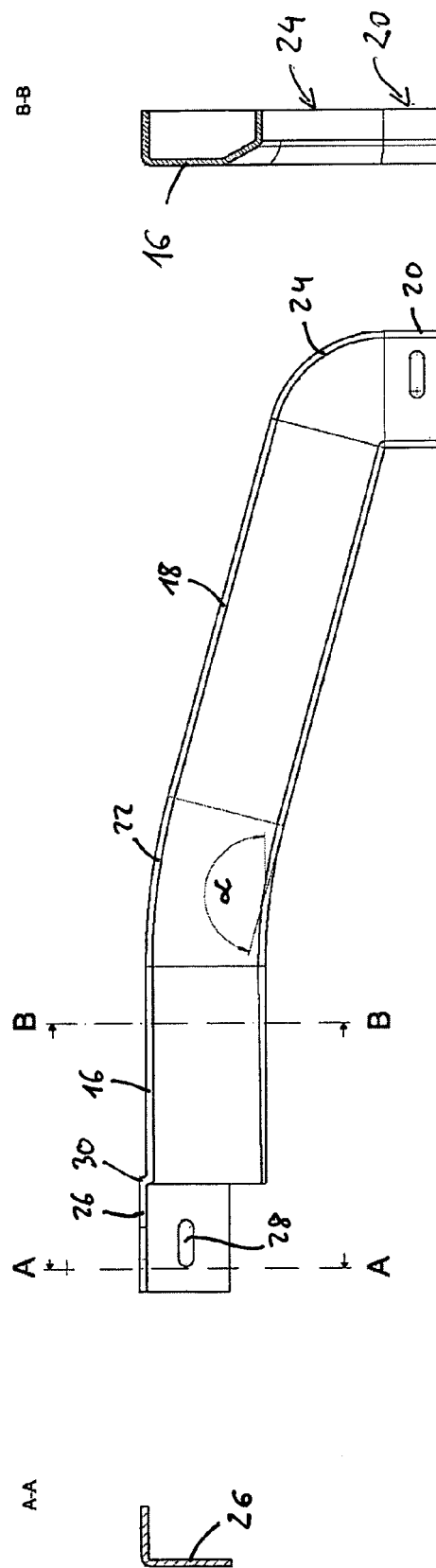


FIG. 2.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 01 6232

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 6 076 589 A (HOERMANN THOMAS J [DE]) 20 June 2000 (2000-06-20) * column 3, line 19 - column 4, line 29; claims 1,2; figures 1-10 *	1-13	INV. E05D15/24
X	FR 2 776 330 A (NOVOFERM FRANCE SA [FR]) 24 September 1999 (1999-09-24) * page 6, line 25 - page 8, line 12; claim 1; figures 1-4 *	1-13	
X	DE 198 57 670 A1 (HOERMANN KG [DE]) 15 June 2000 (2000-06-15) * column 6, line 44 - column 7, line 34; claim 1; figures 3,4 *	1-13	
X	EP 1 176 280 A (NOVOFERM GMBH [DE]) 30 January 2002 (2002-01-30) * paragraph [0018] - paragraph [0020] * * claim 1; figures 1,2 *	1-13	
			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 9 January 2007	Examiner Balice, Marco
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 01 6232

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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09-01-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6076589	A	20-06-2000	AT 301760 T 15-08-2005
			CN 1216084 A 05-05-1999
			CZ 9802882 A3 17-03-1999
			WO 9830776 A1 16-07-1998
			EP 1092074 A1 18-04-2001
			ES 2245023 T3 16-12-2005
			HU 9903057 A2 28-02-2000
			NO 984039 A 10-09-1998
			PL 328813 A1 15-02-1999
FR 2776330	A	24-09-1999	NONE
DE 19857670	A1	15-06-2000	AT 289378 T 15-03-2005
			EP 1010850 A2 21-06-2000
			ES 2235427 T3 01-07-2005
EP 1176280	A	30-01-2002	NONE