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(54) **Guide system for sectional doors**

(57) The invention concerns sectional doors comprising several connected horizontal panels conducted along the guide tracks each one having a top part made up of a first and second horizontal overlapping segment. To each of the ends of the top panel (11') of the door is fitted a first sliding roller (20) positioned in the doorway, within the thickness of the panel itself, and which connects up with and follows the second horizontal segment (18), the one above, of the relative guide track when the door moves between the opening and closing positions. The remaining panels are fitted with other sliding rollers (21) protruding on the internal face of the other panels and following the vertical segment, the curved section and the first horizontal segment of the guide tracks.

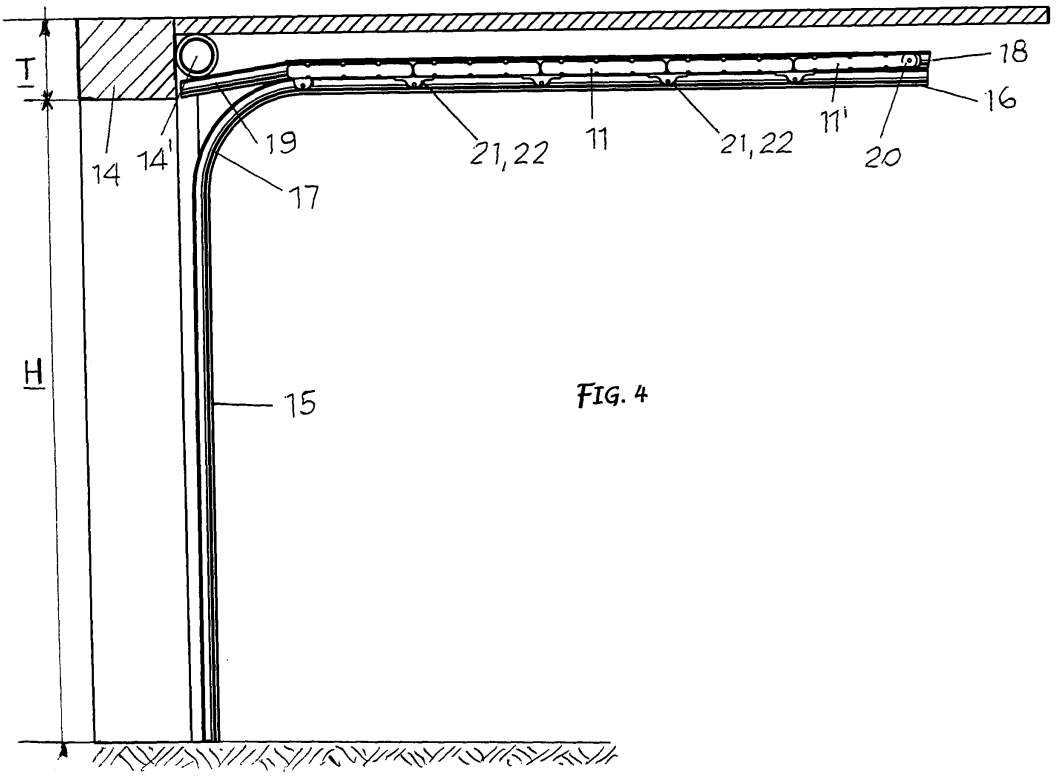

FIG. 4

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Description

Field of the Invention

[0001] This invention concerns sectional doors and in particular an innovative guide and opening system for said doors.

State of the Technique

[0002] As is known sectional doors comprise a number of horizontal connected panels, foldable in line with the connections between the panels and they can follow, besides a rectilinear route, also a curved one.

[0003] For its use in closing garages or the like, each sectional door is mounted and slides between lateral guide tracks which usually have a straight segment, which extends upwards, almost vertically starting from the ground, and that joins at the top with a horizontal segment by means of a curvilinear guide section. In general, the vertical segments of the guide tracks are supported by uprights at the sides of the door which are themselves connected to a top head, which defines the actual height of the entrance span of the garage or the like to which the door is fitted.

[0004] A sectional door is generally movable between a closed position, when it is lowered in a vertical position between the vertical segments of the guide tracks, and an open position, in which it is a raised position between the horizontal segments of the guide tracks.. It can be operated, besides manually, by a motorised group that drives, by means of a drive shaft, two drums for winding/unwinding the cable connected to the opposite sides of the door. The motor group, the drive shaft and winding/unwinding drums are usually mounted on the top head, on the internal side of the latter. The lateral guide tracks can be single along all their extension, both vertical and horizontal, or double along the top horizontal section where, in this case, each track comprises two horizontal and overlapped guide segments This description takes into consideration this second example of sectional doors with horizontal double guide segment tracks.

[0005] Consequently, for its movement between the closed and open positions the door is equipped, on each side, with a first roller which is fixed to its top panel and which connects with and moves along, a horizontal segment, the top one, of the double guide, and rollers fixed to the other panels, connected to and moving along the vertical segment, the curved segment and the other horizontal segment, the bottom one, of the relative track.

[0006] According to the state of the technique however, all the slide rollers, both the top one and the bottom ones, are fixed to the internal face of the panels, each with a respective support. This usual arrangement of the rollers however is the cause for drawbacks and inconveniences which the technicians in this sector are well aware of and which limit the height of the span of the entrance of the garage or the like the door is mounted on. With this type of arrangement of the rollers in fact, the trajectory of the door when moving requires more space in height so that the top of the door, when the latter is moving along the inclined or curved track section, does not come into contact with the overhanging winding/unwinding drums.

[0007] For this reason said drums must be positioned higher than the segments of the horizontal double guide and the front head of the frame which they are fixed to must necessarily be of a height compatible with this layout. And as the height of the supporting frame must be compatible and correlated with the height of the ceiling of the garage or the like to be closed, the front head projects downwards compared to the ceiling thus reducing the useful height of the opening access span.

[0008] On the other side, the horizontal guide segments are at a lower level than the bottom edge of the front head, so that also the door, when open, projects downwards compared to the bottom side of the front head so that also the door, when open, projects downwards compared to the bottom side of the front head causing a further reduction of the height of the span of the opening access to the garage or the like through the door and to the internal rooms which may be present on the sides of the garage and which can only be accessed by passing under the horizontal guide segments. It is also well known that the height of the opening access span to a garage or other area in certain conditions can be critical and just a few centimetres lower can be sufficient to prevent a high vehicle, perhaps with a roof-rack from entering, or when the garage is at the bottom of a ramp and the vehicle on entering the garage is tilted and consequently with one of its parts higher.

Objectives and Summary of the invention

[0009] The main objective of this invention is to effectively avoid the problems and drawbacks mentioned above using a guide and opening system of a sectional type door which enables the reduction in height of the top head of the support frame of the door and to increase, in proportion to the measurements of the door, the useful height of the access opening span into the garage, room or the like the door is fitted to.

[0010] A further objective of the invention is to propose a top horizontal double guide type sectional door, in particular for use on garages and the like, where the segments of the double guide are on a level not lower than the bottom horizontal side of the head of the support frame, so that the actual height of the span of the access opening into the garage or the like remains unchanged even when the door is open, without therefore reducing or limiting the access of high vehicles or because of a ramp find themselves at a critical angle.

[0011] These objectives are reached, according to the invention, with a sectional door made up of several horizontal connected panels moving between a lowered closed position and a raised open position along vertical

guide and double horizontal guide segments supported by a frame with a top front head, and where, in order to move between the closed and open positions the sectional door is equipped, on each side with a first roller fitted to the top panel, connected to and moving along a segment, the top one, of the double horizontal guide, and rollers fitted to the other panels, coupled to and moving along the vertical segment, the curved segment and the other horizontal segment, the one at the bottom of the track, characterised by the fact that the first sliding roller is fixed to the relative end of the top panel so as to be within the doorway, that is within the width of the panel, so that when the door is open it is on a horizontal plane not projecting downwards compared to the bottom side of said front head.

Brief Description of the Drawings

[0012] More details of the invention will however become evident from the following description made with reference to the enclosed diagrammatic drawings, in which:

Fig. 1 shows a view of a double guide for a sectional door;
Fig. 2 shows part of a sectional door to underline the layout of the lateral sliding rollers;
Fig. 3 shows part of a sectional door associated with the guide in Fig. 1 and in the closed position;
Fig. 4 shows a view of the door in its open position; and
Fig. 5 shows an enlarged view of said circled detail in Fig. 3.

Detailed Description of the Invention

[0013] Said drawings represent a part of a sectional door 10 comprising several horizontal panels 11, assembled between lateral guide tracks 12 and movable between a lowered closed and a raised open position.

[0014] The lateral tracks are supported by stanchions 13 that are connected at the top to a front head 14, forming a support frame. On the internal side of the head are fixed in the known way the door balancing and control devices of which only one of the cable winding/unwinding rollers 14' is shown.

[0015] Each lateral guide track 12 - Fig. 1- comprises an almost vertical, rectilinear segment 15, that extends upwards from the ground and that joins at the top with a first horizontal guide segment 16 through a section of curved joint 17. Above the first horizontal segment 16 extends a second horizontal guide segment 18 with a sloping lead-in 19 facing towards the top side of the top panel 11' of the door 10.

[0016] It should be noted that the horizontal guide segments 16, 18 of each lateral track are positioned on a level not below the horizontal front head 14 so that the bottom side of the first horizontal guide segment 16 does not protrude below the bottom side of said head Figs. 1 and 4.

[0017] Laterally, the door is conducted along the guide tracks 12 by means of sliding rollers fixed to the panels-Fig. 3. According to the invention, at each of the opposite ends of the top panel 11' of the door is fixed a first roller 20 positioned in the plane of the door, within the width of the panel itself, as shown in Fig. 2, and that it connects to the second horizontal guide segment 18 to follow the latter when the door moves between the open and closed positions-Figs. 3 and 5.

[0018] Other sliding rollers 21 are fixed to the other panels 11 of the door, each by means of a support 22 fixed, in the usual way, on the internal face of said panels-Fig. 2, 4.

[0019] When the door moves from the closed to the open position, the rollers 20 fixed to the ends of the top panel 11' travel along the second horizontal segment, whereas the other rollers 21 follow the curved section of the vertical segment and the first horizontal segment 16 of the tracks. When the door is open it is horizontal at a level not lower than the front head side as shown in Fig. 4.

[0020] In practice, the whole enables the reduction of the T height of the front head up to about 40% compared to the usual way of construction, increasing the corresponding H height of the opening span the door is fixed to, and to connect the horizontal guide segments on a level with the front head without having to protrude below it.

Claims

1. Sectional door composed of several connected horizontal panels (11) and moving from a lowered closed position to a raised open position between lateral guide tracks supported by two respective stanchions connected to a top head setting the height of the opening span to which the door is fitted, and where each track comprises an almost vertical, rectilinear section (15) which extends upwards from the ground and which joins at the top to a first horizontal guide section (16) by means of a curved joint section (17); above the first horizontal segment (16) extends a second horizontal guide segment (18) having a sloping lead-in (19) facing towards the top side of the top panel (11'); and sliding rollers moving in said guide tracks are attached to the panels, **characterised in that** at each of the ends of the top panels (11') of the door a first sliding roller (20) is fixed positioned in the doorway, within the width of the panel itself, and which couples with and follows the second horizontal segment (18) of the relative guide track when the door moves between the open and closed positions, other sliding rollers (21) being fitted and protruding on the internal face of the other panels to follow the vertical segment, the curved section and the first horizontal segment of the guide tracks.

2. Sectional door according to claim 1, wherein the sliding rollers (20) at the ends of the top panel of the door are positioned near the top side of the panel itself, however not exceeding the thickness of the latter.

3. Sectional door according to claims 1 and 2, wherein the lower side of the horizontal segments (16, 18) of each guide track is on a level with said top head without protruding below it, and the door when open is positioned horizontally on a plane not lower than the bottom side of said head.

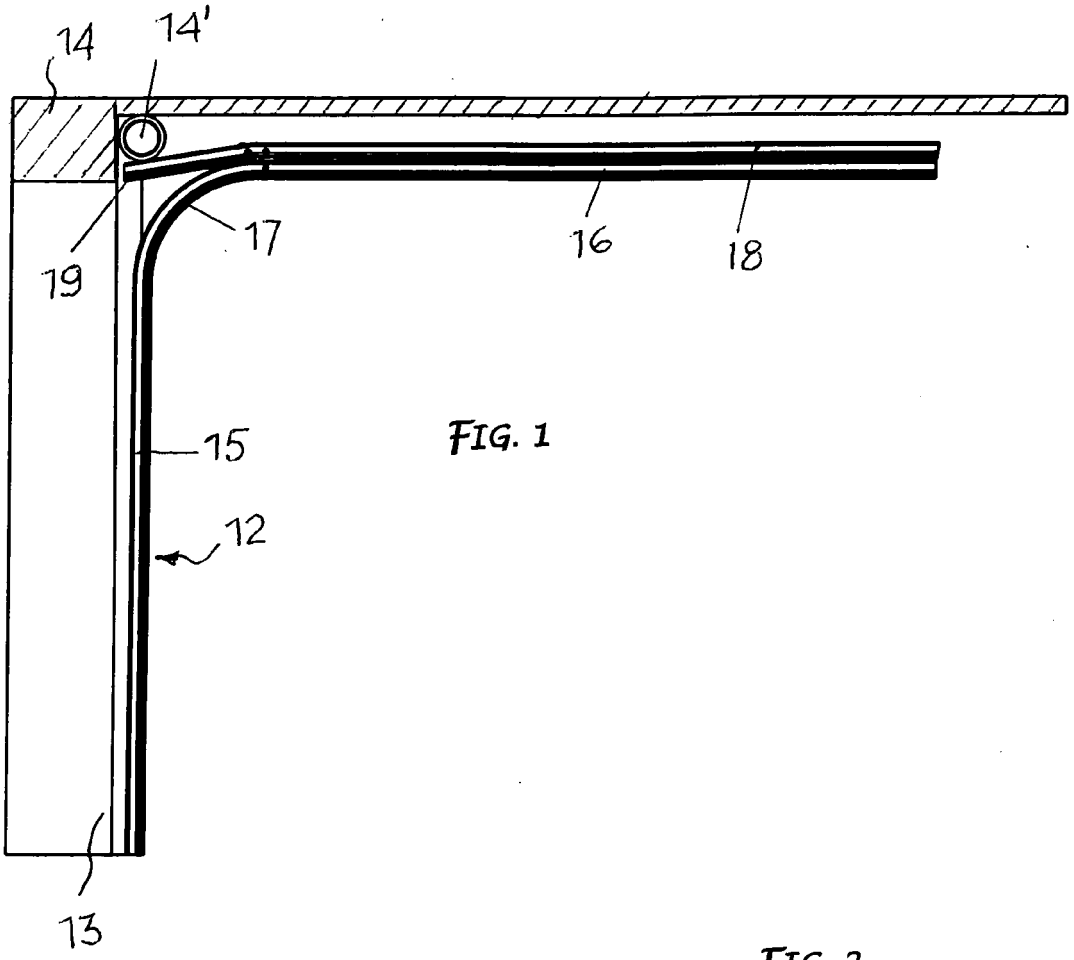
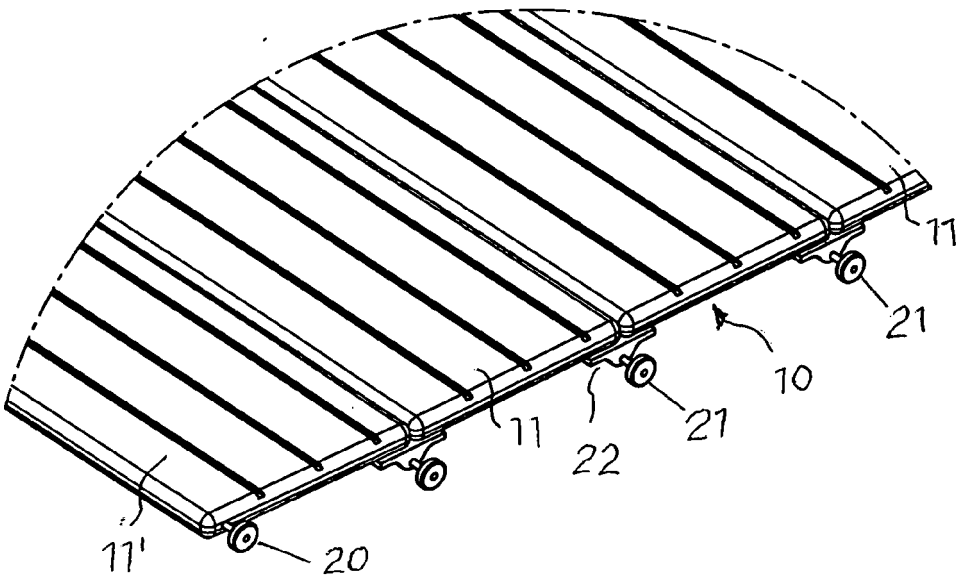


FIG. 1

FIG. 2



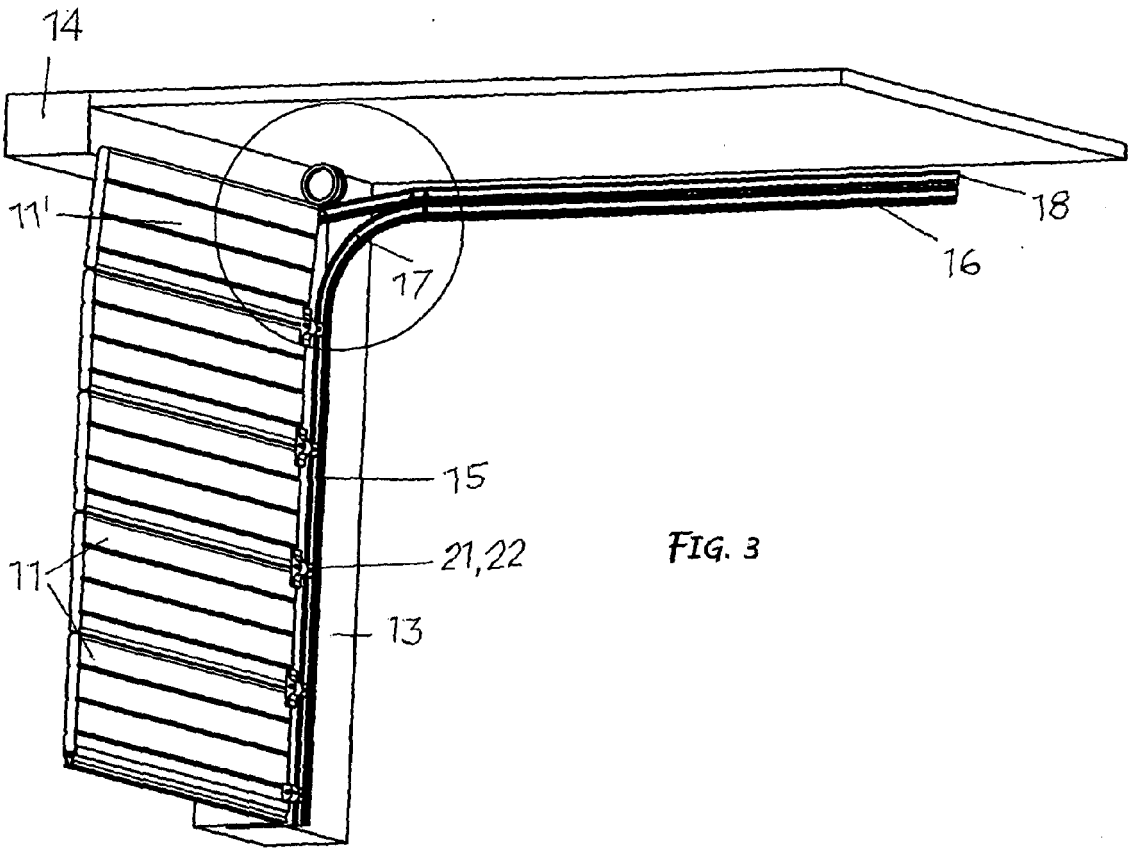


FIG. 3

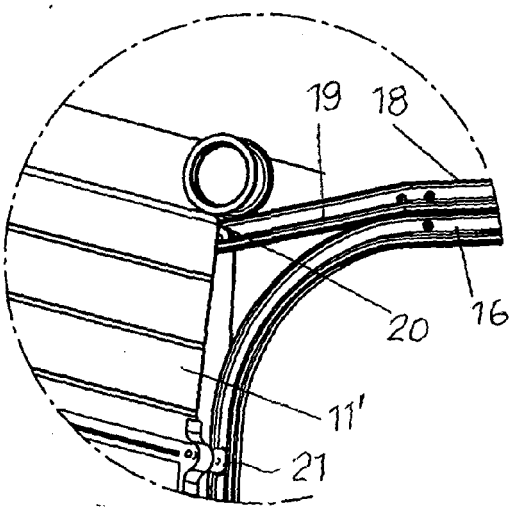


FIG. 5

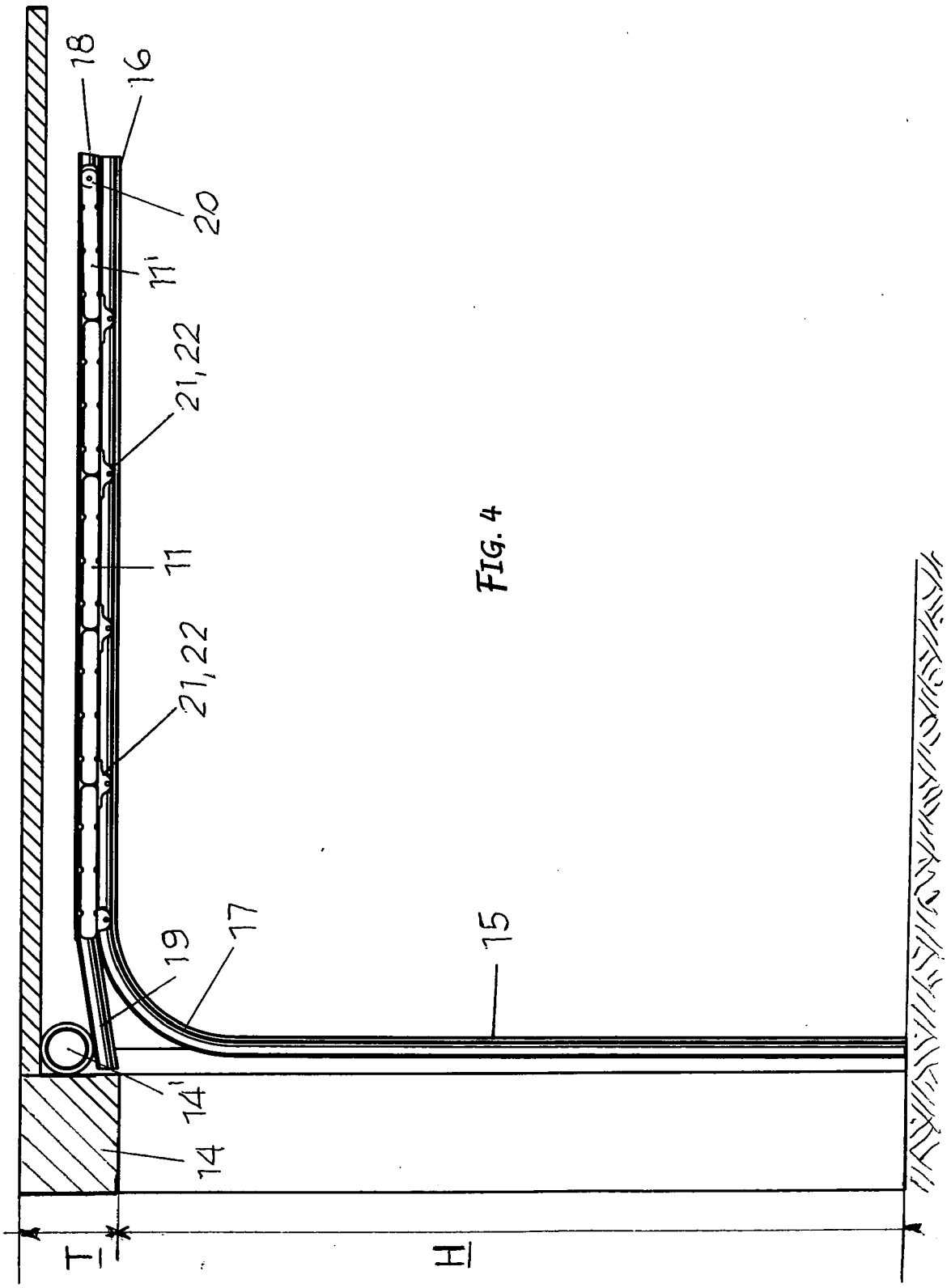


FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5528

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	WO 02/055824 A (PETTINGER S A R L [LU]; PETTINGER JEAN [LU]) 18 July 2002 (2002-07-18) * page 11, line 2 - line 12; figure 1 *	1-3	INV. E05D15/24
X	DE 19 51 657 A1 (KURZ RUDOLF) 13 May 1971 (1971-05-13) * page 7, line 1 - page 9, line 19; figure 1 *	1-3	
X	DE 101 00 894 A1 (NOVOFERM GMBH [DE]) 18 July 2002 (2002-07-18) * paragraphs [0014], [0015]; figures 1-3 *	1-3	
			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
Munich	10 November 2006	Di Renzo, Raffaele

CATEGORY OF CITED DOCUMENTS

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10-11-2006

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