(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 374 747 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.10.2011 Bulletin 2011/41

(21) Application number: **10425116.0**

(22) Date of filing: **12.04.2010**

(51) Int Cl.:
B66B 5/00 *(2006.01)* ***B66B 13/30*** *(2006.01)*
B66B 19/00 *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA ME RS

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(54) System of component parts of an elevator system at the floors of the elevator shaft, and relative mounting method

(57) The method comprises mounting a lower jig (2) adapted to define on one side a floor for laying the flooring and on the opposite side, which faces the runway (VA) as support of the sliding guide of the doors of the elevator system. The method also comprises mounting of an upper crosspiece (1) which can be anchored aligned on said lower jig (2) and fall prevention rails (3) which can be mounted between said lower jig (2) and said upper crosspiece (1). Said mounting carried out before laying the floor of a respective landing (PT) ensures perfect centering of the different openings, and subsequent modular infill of the runway.

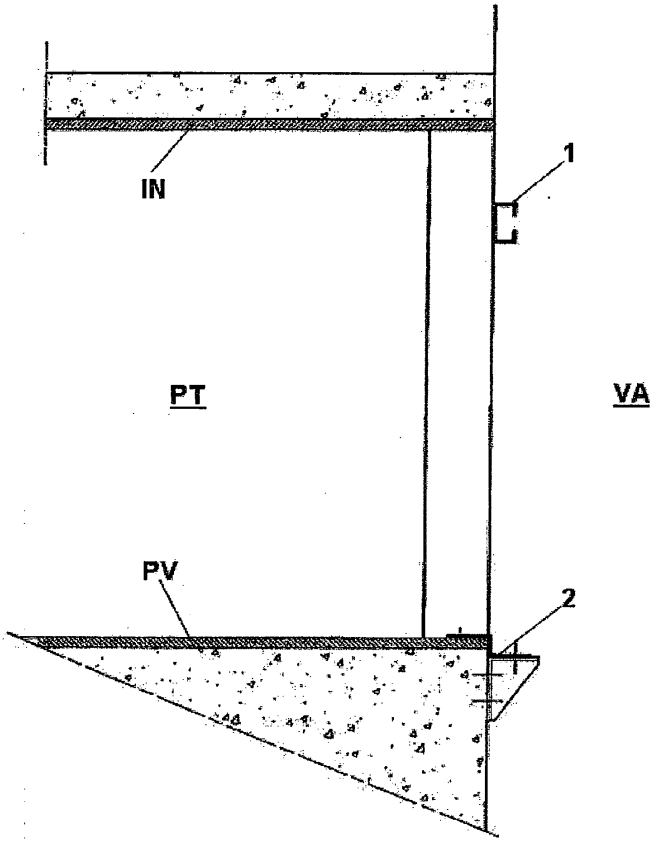

FIG. 1

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Description

Field of the invention

[0001] The present invention relates to a system of component parts of an elevator system at the floors of the runway, and relative mounting method, adapted to allow the mounting of doors at the floors, and interchangeable modular infill of the runway of said elevator system.

State of the art

[0002] Elevator systems are installed inside an elevator runway that is generally constructed at the same time as the structural elements of buildings.

[0003] Said elevator runway is therefore made of reinforced concrete to define a parallelepiped that runs for at least the entire height of the building and which has an opening for each landing served by the elevator system.

[0004] Therefore, during construction of a building the structure or carcass is first produced, and subsequently the electrical, plumbing and heating systems, and the elevator system with relative landing doors, are installed. Only after this is it possible to carry out the finishes.

[0005] For safety reasons, it is preferable not to have different teams of workers working simultaneously at the building site.

[0006] This means that when those in charge of installing the elevator mount the doors at the landing, the floors, marble and/or wood defining the jambs of the openings of the elevator runway have not yet been installed.

[0007] However, it is not possible to reverse the order of installation as centering and squaring of the doors at the various floors must necessarily be ensured in the same position.

[0008] Moreover, masonry works are required after said installation works, which interfere with the quality of the final finish.

[0009] Therefore, installation of said finishing works results in a considerable loss of time and money.

[0010] In practice, the doors of the various floors must be equidistant and perfectly aligned with one another, so that the motors of the car can, by means of suitable couplings, open the doors correctly on each landing.

[0011] According to another aspect related to safety, during the works to build the carcass, the openings of the elevator runway must be blocked off in order to prevent people from accidentally falling into the elevator runway.

[0012] For this purpose, carpenters provide a barrier, generally made of wood, nailed to the walls defining the stairwell, until it is time for the team of workers to mount the doors at the floors.

[0013] Consequently, these workers must remove said barrier before starting to mount the doors at the landing, losing further time.

[0014] Therefore, a principal problem is that of reducing to a minimum any adjustments to the finishes after mounting of the doors at the floors, and another no less important problem concerning safety is that of ensuring that the openings of the elevator runway are blocked off on each landing.

Summary of the invention

[0015] The object of the present invention is to provide a system of component parts of an elevator system at the floors of the runway, and relative mounting method, adapted to solve said mounting and safety problems, and to allow mounting of doors at the floors, and modular infill of the runway of the elevator system.

[0016] A particular object of the present invention is a system of component parts of an elevator system at the floors of the runway, and relative mounting method, as better described in the claims, which form an integral part of the present description.

Brief description of the figures

[0017] Further features and advantages of the invention will be more apparent in the light of the detailed description of preferred, but not exclusive, embodiments thereof, shown by way of non-limiting example with the aid of the accompanying drawings, wherein:

- Fig. 1 represents a section of an elevator runway in which a system according to the present invention is mounted;
- Fig. 2 represents an enlargement of a portion of the preceding figure;
- Figs. 3 and 6 represent a front view from the landing side of an elevator runway in which the system forming the subject of the present invention is mounted, respectively before and after mounting of infill panels and of the doors;
- Fig. 4 represents a variant of the invention according to the preceding figures;
- Fig. 5 represents an exploded view of the structural elements of the system, according to a preferred embodiment.

[0018] The same reference numbers and letters in the figures identify the same elements or components.

Detailed description of a preferred embodiment of the invention

[0019] The system forming the subject of the present invention provides for the mounting of an upper crosspiece 1 and a lower jig 2.

[0020] Said crosspiece and said jig define the exact position of the suspensions and of the thresholds of the doors of all the floors.

[0021] Mounting these in an elevator runway VA for

each of the openings at the floors, before laying the flooring of a respective landing PT, ensures perfect centering of the various openings with respect to elevator travel.

[0022] Advantageously, preliminary positioning of a jig 2 and of an upper crosspiece 1 for each opening of the elevator runway allows constructional inaccuracies of the structures to be corrected, as workers called to lay flooring and apply plaster are obliged to take said jigs and crosspieces as reference for finishing each landing. Moreover, it is no longer necessary to carry out any structural preparation for positioning of the doors at each opening of the elevator runway, as positioning of the upper crosspiece 1 and of the jig 2 allows filling panels, defining the edge margins of the opening of the doors, to be installed.

[0023] Further, in conformity with the present invention, said upper crosspiece 1 is of a length equivalent to the width of the side of the elevator runway in which the opening is produced and is anchored to the runway at the ends, abutting against the side walls, to define a fixed-end beam.

[0024] This anchoring ensures that the position of the crosspiece can be adjusted to ensure it is plumb in relation to the respective jig 2 and consequently to all the other jigs of all the other openings of the runway at other floors.

[0025] Moreover, the lower jig 2 is also of the same length as the width of the side of the elevator runway in which the opening is produced, minus the dimensions of the finishes 37 and a further adjustment margin 38 (Fig. 3).

[0026] According to a preferred variant of the invention, said lower jig has an S-shaped section in which an upper plate 2' and a lower plate 2" are parallel and staggered and joined by a transverse plate 2'" to the first two (Fig. 2).

[0027] Said jig 2 is mounted so that said upper plate 2' defines the level of the floor PV for the subsequent flooring step.

[0028] Said lower plate 22', being staggered with respect to the upper plate 2', projects into the elevator runway for application of the threshold for sliding of the doors at the landing, which slide inside the elevator runway.

[0029] Preferably, said upper crosspiece 1 is produced by means of a box element, for example with a C-section with internal (or also external) folded edges, although other shapes can be used.

[0030] To anchor the upper crosspiece 1 against the lateral walls it is advantageous to use at least one pair of L-shaped elements 6, positioned symmetrically to each other with the supporting part arranged so as to exit from the shape of the upper crosspiece 1, for simple anchoring and coupling of the crosspiece to the lateral walls of the elevator runway.

[0031] Until the doors are mounted, one or more fall prevention rails 3 (preferably two) can be positioned between said upper crosspiece 1 and said lower plate 2" of said lower jig 2 to define a fall prevention barrier (Fig. 4).

[0032] For this purpose, said lower plate 2" and said upper crosspiece 1 comprise a suitable number of holes through which to anchor, for example with screws, or by interlocking, said fall prevention rails 3.

[0033] Advantageously, connection of said fall prevention rails 3 to said jig and to said crosspiece is such as to maintain the rails inside the elevator runway, avoiding any interference with the application of plaster, marble, wood or tiles.

[0034] Fig. 1 shows a section of an elevator runway VA at a landing PT. It can be clearly seen that the floor PV has been laid so as to pass under the upper plate 2' of the jig 2.

[0035] According to further variants of the invention, the floor can be taken perfectly to the level of said first plate 2' or can be at a slightly higher level to said plate. In fact, according to a preferred variant of the finding, said upper plate 2' is provided with an anti-slip covering (not shown).

[0036] According to another aspect of the invention, the plaster IN of the ceiling and of the walls can be applied with continuity up to the inner edge of the openings of the elevator runway VA, taking as reference the transverse plate 2'" of the jig and the edge of the upper crosspiece 1 outside the runway.

[0037] The jig 2 is associated with the floor of a landing PT, for example by means of two or more first square support elements 4. With reference to Fig. 4, in addition to or alternatively to said first square elements 4, second square elements can be provided, adapted to be associated with the lateral walls to support said jig 2 in proximity of the respective ends. Said square support elements comprise slots extending sufficiently to allow adjustable mounting of said lower jig 2 with respect to the runway VA, both vertically and horizontally.

[0038] Fig. 4 shows installation of said rails 3 associated with said crosspiece and with said jig. Said rails 3, in a preferred variant comprise one or more hooked elements 31, for insertion of planks or other suitable horizontal fall prevention elements 32 contributing towards blocking off access to the elevator runway.

[0039] Said rails 3 can comprise different anchoring means of horizontal fall prevention elements.

[0040] As can be seen from the figures, said elevator runway VA is preferably completely open, in the sense that at each landing its opening is defined at the perimeter by the floor, by the ceiling and by the lateral walls of the runway itself. In other words, instead of being formed of four sides, the elevator runway can be formed of only three sides, without counting the surface of the soffit depth which at each landing faces the elevator runway.

[0041] Fig. 5 shows an exploded view of the component parts for installation of the system at a landing, in a situation in which the opening of the elevator runway is complete. Horizontal 10 and vertical 11, 12 infill panels are also shown.

[0042] It can be noted that the upper crosspiece 1 and the lower jig 2 are advantageously of a length such as to almost entirely cover the width of the elevator runway.

[0043] In Fig. 5 it is assumed that the doors slide telescopically only on one side (left in the figure) but it is evident that in other installations the doors can open symmetrically, with one door opening to the left and one door opening to the right. The infill panels (10, 11, 12), installed subsequently, are composed of sheets comprising bends at the edges and structural support elements, inserted in the edge bends, in the inner part of the sheets facing the elevator runway. The edge bends are preferably only present on two opposite sides of the panel: for example, in the vertical panels 11 and 12 bends 20, 21 are present on the vertical sides, while in the horizontal panel bends 22, 23 are present on the horizontal sides. In the present context vertical and horizontal refer to the direction when mounted. More in particular, an upper support bar 30 is inserted horizontally between the bends 20, 21 of the vertical sheet 11, and anchored there in a slightly higher position to that corresponding to the crosspiece 1, with rivets. At least one square 31 in the shape of an S facing the inside of the panel is anchored to the upper bar 30. When mounting the panel, the square is used to hang the panel to the upper crosspiece.

[0044] A lower bar 32 is inserted horizontally between the bends 20, 21 of the vertical sheet 11 on the bottom thereof. After having hung the panel to the crosspiece, the upper bar is anchored to the crosspiece 1, while the lower bar is anchored to the jig 2, for example with screws.

[0045] Further reinforcing elements are formed by a further horizontal bar 33 and a box rail 15 anchored between the two bars 32 and 33 and anchored to the inner side of the panel 11, for example by gluing.

[0046] The further reinforcing elements can be omitted depending on the width of the panel, for example in the narrower vertical panel 12, which is however installed in the same manner as the panel 11, on the opposite side of the runway. Therefore, the panel 12 comprises, similarly to the panel 11, an upper bar 30' and a lower bar 32', and a square 31'.

[0047] Two box elements 34, 35 are inserted vertically at opposite sides of the horizontal panel 10, in the bends 22, 23. Squares 36, 36' are anchored to the box elements. The horizontal panel 10 is installed in the same manner as the vertical ones, first hung on the crosspiece 1 through the squares, then anchored to the crosspiece and to the vertical panels.

[0048] After installation of the panels, appropriate beading strips are inserted at the edge to cover the gaps remaining between the wall and ceiling edges, and the external edges of the panels.

[0049] L-shaped beading strips 17 are inserted at the vertical edges.

[0050] A horizontal crosspiece 16, with C-shaped profile with folded edges, internal on the upper edge and external on the lower edge, is firstly installed on the upper edge of the panels, starting from the side of the runway. The horizontal crosspiece 16 is anchored with rivets to the upper end of the panels 10, 11, and 12, and contributes towards the alignment thereof.

[0051] An L-shaped beading strip 18 is then inserted, anchored to the upper side of the crosspiece 16. The enlargement of the profiles of the crosspiece 16 and of the beading strip 18 can be seen in the enlargement of Fig. 5.

[0052] A vertical stop 40, to stop the doors in closed position, and a horizontal element 41 can also be present laterally.

[0053] It can easily be noted that the infill is composed of panels with anchoring system to the structural part that allows them to be substituted in time with a simple and rapid operation without work on the structural part, on the suspensions and on the landing door panels which remain installed also during this operation.

[0054] Therefore, a single panel, several panels or all the entire infill can be replaced at any time without any work on the elevator system.

[0055] The use of infill panels also simplifies positioning of the elevator call button, as it can be produced directly on the infill panel. See, for example, Fig. 6 in which the call buttons 28 are installed directly on the panel 11.

[0056] By a preliminary operation of the elevator mounting team to position said jig and said upper crosspiece, there are advantages in terms of:

- certainty of the tolerances of the finishes,
- simple subsequent mounting of the elevator
- quality of execution of the works as a whole,
- simple blocking off of the elevator runway during building finishing works.

[0057] The mounting method of the invention makes it possible, for the entire time rqeuired for this mounting, to avoid masonry works, as work takes place with the runways fully open at the floors.

[0058] Moreover, even if said jig 2 and said upper crosspiece 1 are soiled by building finishing works, they are not destined to remain in view.

[0059] The system of the invention also allows installation of door openings on different sides at the various floors, in the case in which it is necessary to provide the elevator car with doors on more than one side, for door opening on different sides at different floors of the building.

[0060] Although the present description refers explicitly to an elevator, the same concepts can also be applied to any lift system having the same problems as elevators. Variants of embodiment to the non-limiting example described are possible, without departing from the scope of protection of the present invention, comprising all equivalent embodiments for those skilled in the art.

[0061] The advantages deriving from application of the present invention are apparent. Besides those already listed above, the following can also be mentioned.

[0062] There are evident advantages for the firm installing the elevator system:

- absence of interaction and, consequently, independ-

ence from the programming of the building firm;

- simplicity, with automatic positioning of the suspensions of the landing: only centering must be checked;
- the elevator system can be sold complete with all its parts including the infill panels of the elevator runway with a customized system in modules;
- after sales management: any request from the customer to change the construction and finishing material can be satisfied, by replacing the panels at any time in a simple, rapid and consequently inexpensive manner, without work on any component of the elevator system;
- no time lost in general cleaning and for checking system operation of equipment soiled by the finishing material of the building firm;
- hand-over of the system to the customer in perfect finished condition.

[0063] There are also advantages for the building firm:

- it is no longer necessary to construct customized jambs and headers;
- finishing operations are no longer necessary after installation of the doors of each landing by the firm installing the elevator system;
- the structural part is used as jig to apply the plaster or other type of finish and lay the floors;

[0064] it is possible to finish the building completely, with regard to the floor and also paint the stairwell, having installed only the mechanical part of the elevator system and the structural part of the system.

[0065] There are also advantages for the building planner:

- no information is required for positioning of jambs or lowering of the header during planning of the elevator runway.

[0066] Moreover, the advantages in terms of safety are evident:

- the system is designed for installation of supports for laying wooden planks to protect against falling into the elevator runway;
- the supports for installation of the wooden planks have standard thickness necessary to prevent falling into the elevator runway;
- the system also comprises the standard safety sign to install at the center of the top wooden plank indicating falling hazard;
- the building firm only needs to provide the wooden planks, without also having to worry about how these are anchored.

[0067] From the description above those skilled in the art are able to produce the subject of the invention without introducing further constructional details.

Claims

1. A system of component parts of an elevator system at the floors of the runway (VA) of the system, comprising:

   a lower jig (2) shaped to define on a first side (2') a level of a floor and on a second opposite side (2") a sliding guide of the doors of the elevator system in the runway (VA),
   an upper crosspiece (1) comprising anchoring means (6) adjustable to anchor said crosspiece (1) abutting against the side walls of the runway so as to be plumb with respect to said jig (2).

2. The system according to claim 1, further comprising one or more fall prevention rails (3) and wherein said lower jig (2) and said upper crosspiece (1) comprise anchoring means to hold said one or more fall prevention rails (3) vertically between said lower jig (2) and said upper crosspiece (1).

3. The system according to claim 1, wherein said jig comprises an upper plate (2') defining said first side and a lower plate (2") defining said second side; said plates being parallel and mutually staggered and joined by a transverse plate (2"') to the first two.

4. The system according to claim 1, wherein said upper crosspiece (1) is C-shaped with folded edges, and/or wherein said anchoring means (6) are L-shaped adapted to be coupled to a perimeter wall of the runway and to a surface defining said upper crosspiece, perpendicular with respect to said perimeter wall.

5. The system according to claim 2, wherein said one or more fall prevention rails comprise at least one hooked element (31) for anchoring of one or more horizontal fall prevention elements (32).

6. The system according to any one of the preceding claims, further comprising an infill comprising one or more modular panels (10, 11, 12) connected to said lower jig (2) and/or to said upper crosspiece (1) to finish and cover the runway at the floors, excluding the area of the doorways.

7. The system according to claim 6, wherein said panels (10,11, 12) comprise bends at the edges and structural support elements (30, 32, 33, 30', 32'), and/or box-shaped elements (34, 35) inserted in said bends.

8. The system according to claim 7, wherein one or more squares (31, 31', 36, 36') adapted to allow said modular panels to be hung on said crosspiece during mounting, are anchored to at least one structural support element and/or box-shaped element.

9. The system according to claim 8, wherein said panels (10,11, 12) comprise one or more box-shaped rails (15) adapted to be anchored between said structural support elements.

10. The system according to claim 6, comprising covering beading strips (16, 17, 18) on the edge of said infill.

11. The system according to claim 3, further comprising first (4) and/or second square elements (5) to support said lower jig (2) comprising appropriate slots so as to allow adjustable mounting of said lower jig (2).

12. A method of mounting a system according to any one of the preceding claims, in at least one runway (VA) of an elevator system comprising the following steps:

- applying said lower jig (2) to said runway (VA) before laying the floor of a respective landing (PT), so that on a first side (2') it defines a level of a floor of said landing (PT) and on a second opposite side (2") a sliding guide of the doors of the elevator in the runway (VA), said opposite side facing the runway (VA);
- mounting said upper crosspiece (1) so that it is plumb with respect to said lower jig (2).

13. The method according to claim 12, wherein application of said lower jig is carried out plumb with respect to a further lower jig (2) of another opening of the runway (VA).

14. The method according to claim 12, comprising a step of hooking one or more fall prevention rails (3) at the top to said upper crosspiece (1) and at the bottom to said lower jig (2), it being possible to subsequently apply further fall prevention elements (32) to said one or more fall prevention rails.

15. The method according to claim 12, comprising further steps of:

- mounting said infill panels (10, 11, 12) through hooking to said crosspiece (1) and subsequent anchoring to the crosspiece and to said jig (2);
- anchoring said covering beading strips (16, 17, 18) to the edge of said infill.

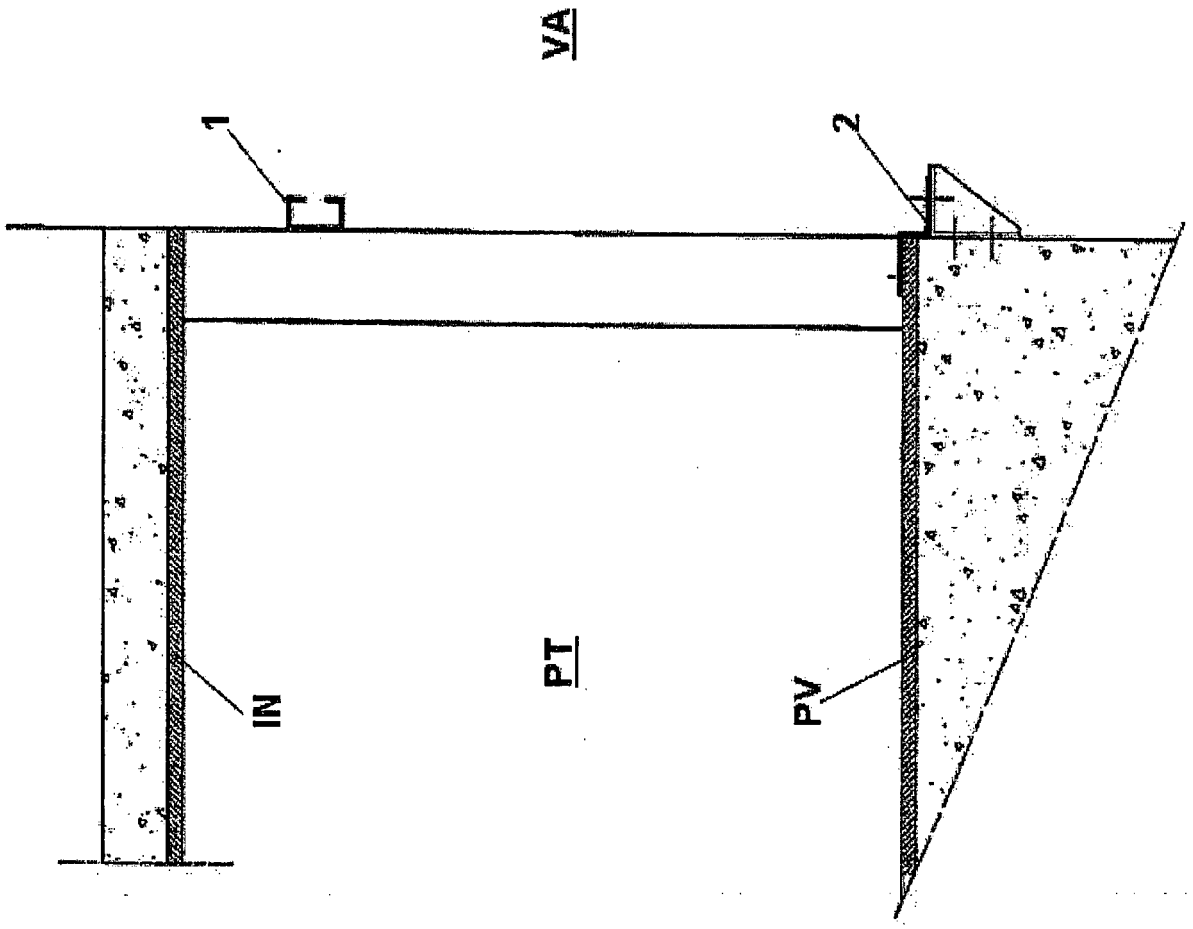

FIG. 1

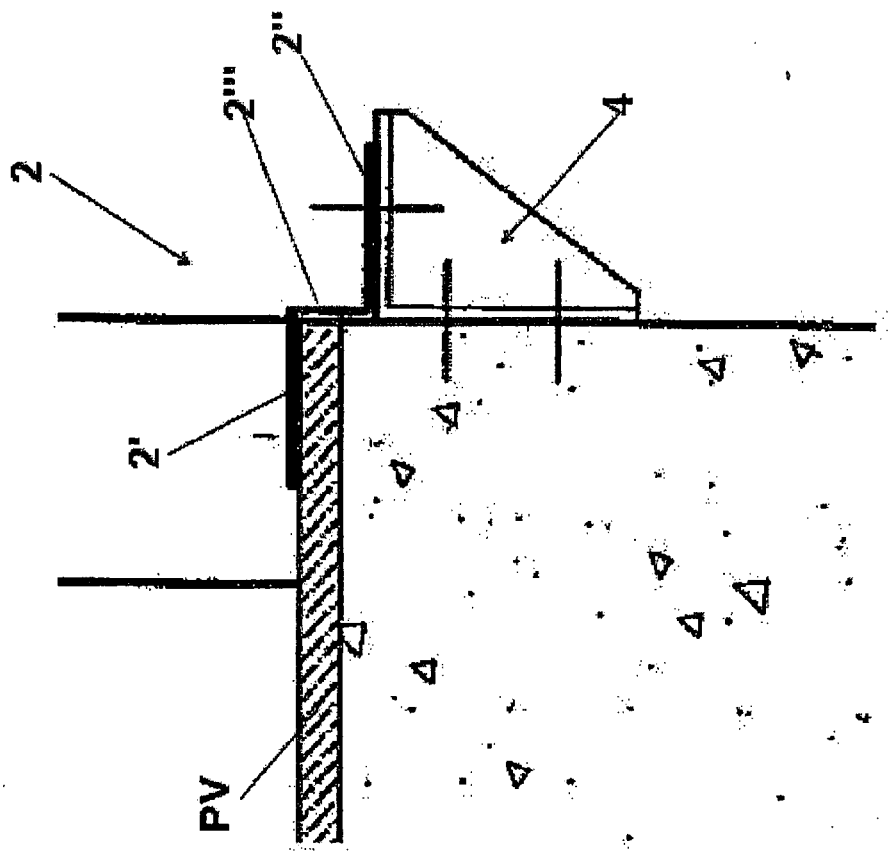

FIG. 2

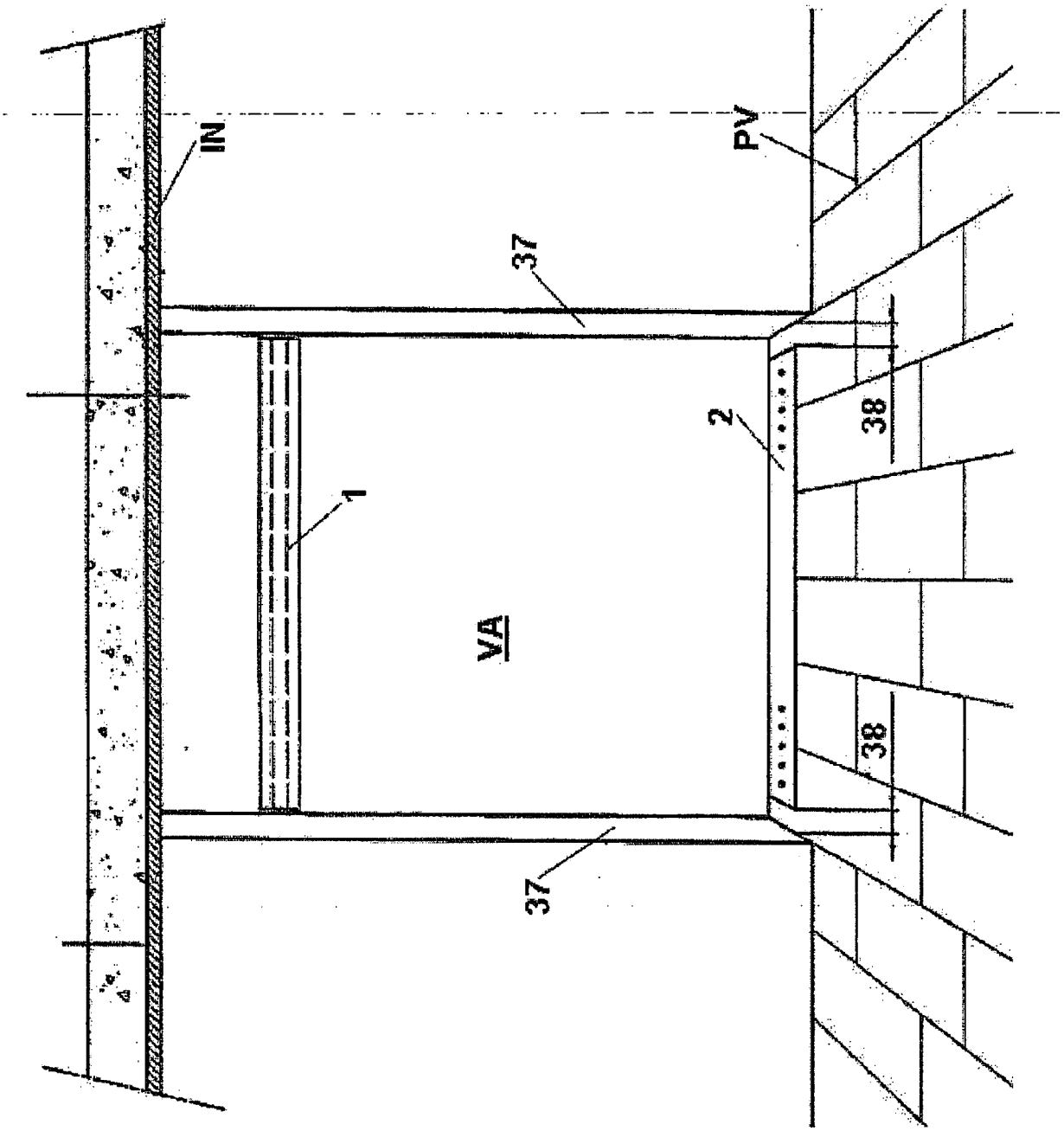

FIG. 3

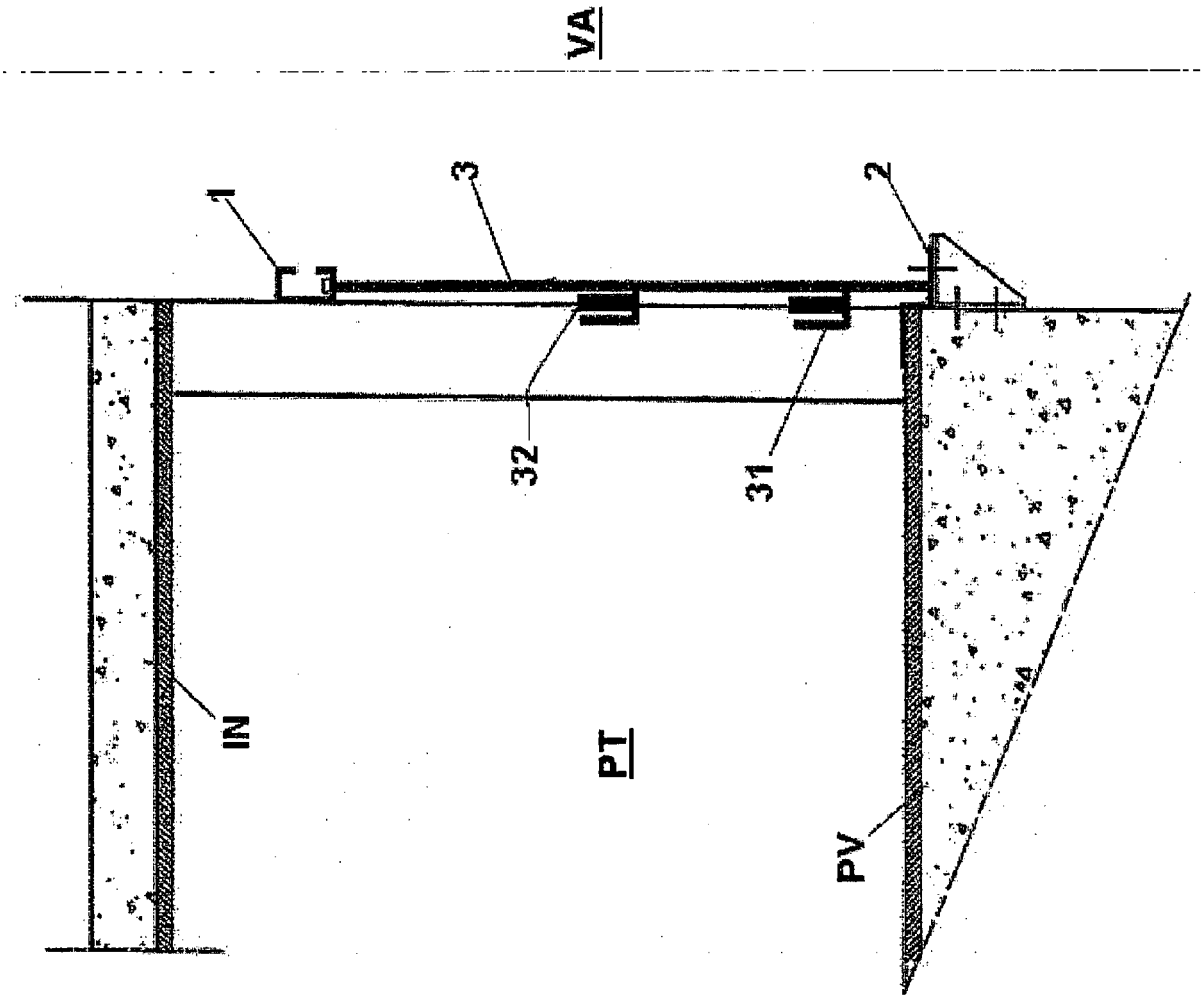

FIG. 4

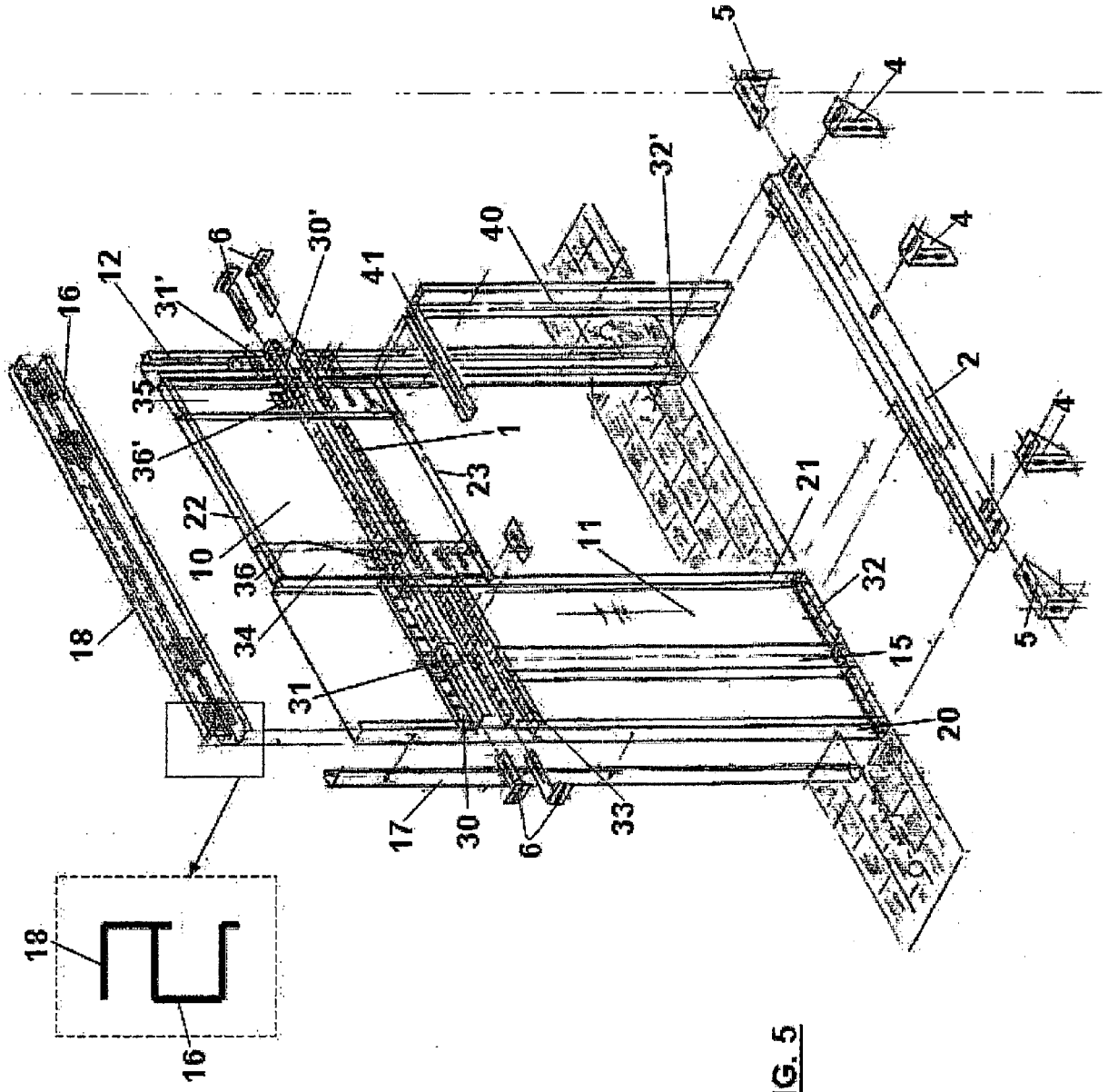
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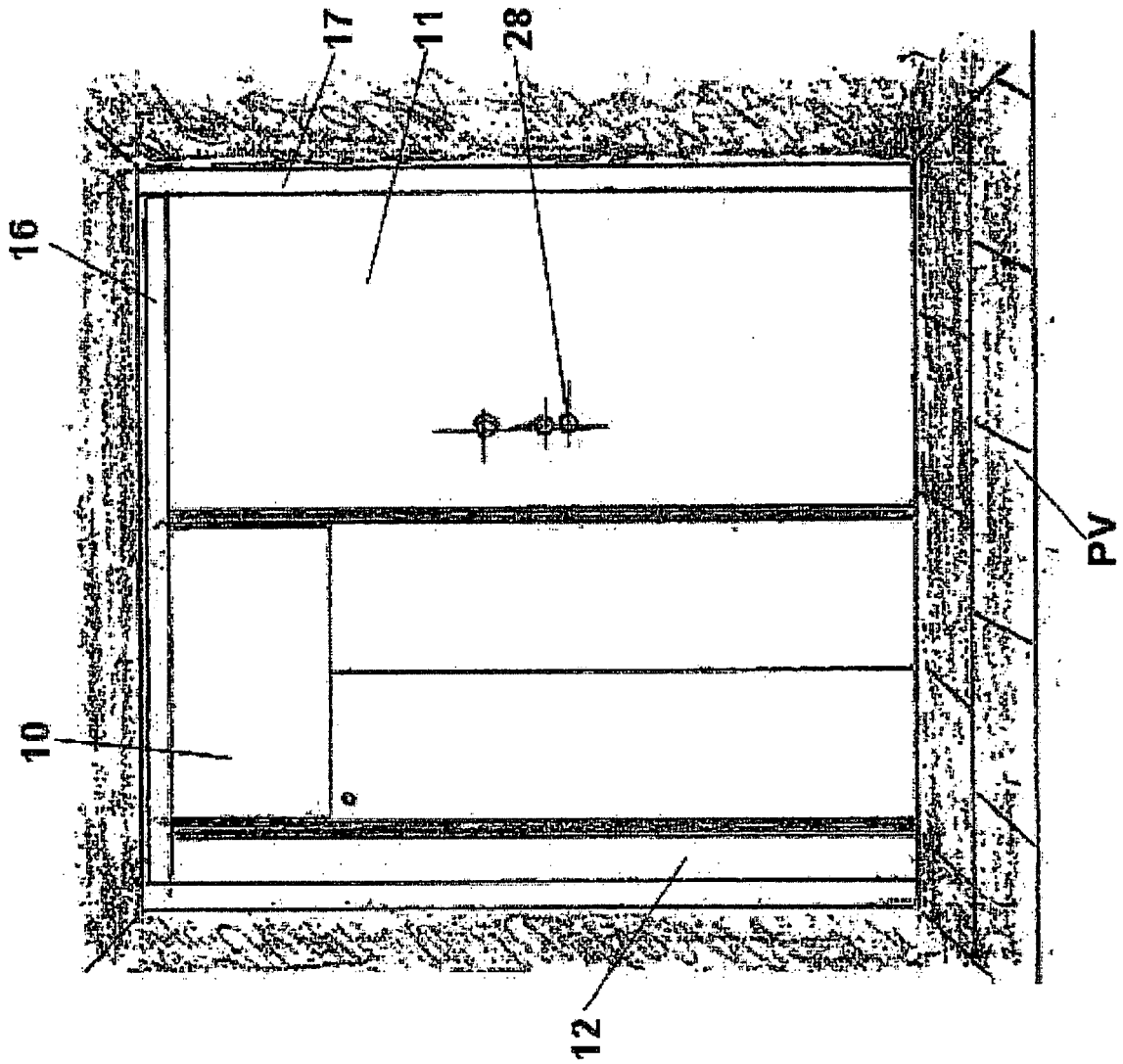
FIG. 5

FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 10 42 5116

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 94 09 561 U1 (THYSSEN AUFZUEGE GMBH [DE]) 4 August 1994 (1994-08-04)	1,6-10, 12,15	INV. B66B5/00
A	* page 6, line 24 - page 7, line 24 * * claims 1,11-14 * * figure 2 *	2,5,14	B66B13/30 B66B19/00

Y	DE 103 33 086 A1 (WITTUR AG [DE]) 17 February 2005 (2005-02-17)	1,6-10	
A	* paragraph [0025] - paragraph [0036] * * figure 1 *	2,5,12, 14	

Y	EP 1 679 281 A1 (PEELLE COMPANY LTD [CA]) 12 July 2006 (2006-07-12)	1,6-10, 12,15	
A	* the whole document *	2,5,14	

Y	US 3 426 480 A (DZAMBA EDWARD T) 11 February 1969 (1969-02-11)	1,4, 6-10,12, 15	
A	* column 3, line 1 - line 68 * * figures 1-3 *	2,5,14	
	-----		TECHNICAL FIELDS SEARCHED (IPC)
Y	WO 2008/091132 A1 (DOO SUNG N T CO LTD [KR]; KWON JAE-WON [KR]; HONG CHAE-MIN [KR]) 31 July 2008 (2008-07-31)	1,6-10, 12,15	B66B E04G
A	* page 1, line 25 - page 3, line 1 * * figures 9, 10 *	2,5,14	

A	EP 0 512 210 A1 (INVENTIO AG [CH]) 11 November 1992 (1992-11-11) * the whole document *	2,5,14	

Y	US 6 145 630 A (FRIEDMAN HAROLD S [US] ET AL) 14 November 2000 (2000-11-14) * the whole document *	4,6,9,15	

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~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
The Hague	16 March 2011	Oosterom, Marcel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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L : document cited for other reasons

& : member of the same patent family, corresponding document

3

EPO FORM 1503 03.82 (P04C01)

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 3 741 351 A (SUOZZO J) 26 June 1973 (1973-06-26) * abstract * * column 2, line 44 - column 3, line 32 * * figures 2,3 *	4,6,15	
Y	FR 2 120 596 A5 (LABROSSE JOSEPH) 18 August 1972 (1972-08-18) * the whole document *	6-10,15	
Y	WO 99/57403 A1 (KONE CORP [FI]; KETONEN ARI [FI]) 11 November 1999 (1999-11-11) * the whole document *	6,10,15	
Y	US 2002/178663 A1 (CHRISTEN JULES [CH] ET AL) 5 December 2002 (2002-12-05) * the whole document *	10,15	
Y	US 2007/256374 A1 (ZAPPA ROBERTO [IT]) 8 November 2007 (2007-11-08) * the whole document *	9,15	
Y	US 4 875 552 A (SMITH STEPHEN W [US] ET AL) 24 October 1989 (1989-10-24) * abstract * * column 3, line 59 - line 64 * * column 4, line 52 - column 5, line 2 * * figures 2,3,6-8 *	15	
Y	EP 2 019 074 A1 (MACPUAR S A [ES]) 28 January 2009 (2009-01-28) * abstract * * paragraph [0016] * * figures 1,5 *	15	

TECHNICAL FIELDS SEARCHED (IPC)

~~The present search report has been drawn up for all claims~~

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EP 10 42 5116

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

1, 2, 4-10, 12, 14, 15

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 10 42 5116

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1, 2, 5, 12, 14

   Fall prevention rails.

   ---

2. claims: 1, 3, 11-13

   Details of the lower jig.

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3. claims: 1, 4

   Details of the upper crosspiece.

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4. claims: 1, 6-10, 12, 15

   Infill to cover the runway at the floors.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 42 5116

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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16-03-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 9409561 U1	04-08-1994	NONE	
DE 10333086 A1	17-02-2005	CN 1826282 A	30-08-2006
		EP 1646576 A1	19-04-2006
		WO 2005019086 A1	03-03-2005
		ES 2290746 T3	16-02-2008
		RU 2309110 C2	27-10-2007
EP 1679281 A1	12-07-2006	BR PI0600015 A	19-09-2006
		CA 2531480 A1	10-07-2006
		KR 20060081666 A	13-07-2006
		SG 124336 A1	30-08-2006
		US 2006175144 A1	10-08-2006
		US 2008035817 A1	14-02-2008
US 3426480 A	11-02-1969	NONE	
WO 2008091132 A1	31-07-2008	CN 101641278 A	03-02-2010
		EP 2109581 A1	21-10-2009
		JP 2008179482 A	07-08-2008
EP 0512210 A1	11-11-1992	AT 129042 T	15-10-1995
		AU 651195 B2	14-07-1994
		DE 59203944 D1	16-11-1995
		DK 0512210 T3	26-02-1996
		ES 2080972 T3	16-02-1996
		FI 921907 A	03-11-1992
		HU 60976 A2	30-11-1992
		NO 921695 A	03-11-1992
		US 5241789 A	07-09-1993
US 6145630 A	14-11-2000	US 6202798 B1	20-03-2001
US 3741351 A	26-06-1973	CA 944286 A1	26-03-1974
FR 2120596 A5	18-08-1972	NONE	
WO 9957403 A1	11-11-1999	AU 3934099 A	23-11-1999
		FI 103030 B1	15-04-1999
US 2002178663 A1	05-12-2002	AT 492503 T	15-01-2011
		AU 783819 B2	08-12-2005
		AU 4061402 A	21-11-2002
		BR 0201693 A	11-03-2003
		CA 2386119 A1	14-11-2002
		CN 1385354 A	18-12-2002

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 42 5116

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-03-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002178663 A1		JP 2002348078 A	04-12-2002
		NO 20022265 A	15-11-2002
US 2007256374 A1	08-11-2007	AT 454351 T	15-01-2010
		CN 201056451 Y	07-05-2008
		EP 1847502 A1	24-10-2007
		ES 2338593 T3	10-05-2010
		IT BG20060012 U1	22-10-2007
US 4875552 A	24-10-1989	NONE	
EP 2019074 A1	28-01-2009	NONE	

EPO FORM P0459

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