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(54) **Support device to support a formwork for floors**

(57) Support device to support a formwork (11) for floors, comprising an upright element (26) which keeps the modules (12) of the formwork (11) at a determinate height, and a support head (27) mounted on the upright element (26) and provided with a supporting bracket (30) on which said modules (12) are directly disposed. The support head (27) comprises snap-in attachment means (46) suitable to be constrained to the upright element (26). The snap-in attachment means are provided with

at least a first constraint tooth (50), disposed on a first side of the support head and movable between a first constraint position, in which it prevents the detachment of the support head (27), and a second detachment position, in which it allows the detachment of the support head (27), and a second constraint tooth (51) disposed on the opposite side of the support head (27) with respect to the first constraint tooth (50), and this also having a first constraint position associated to the upright element, and a second detachment position.

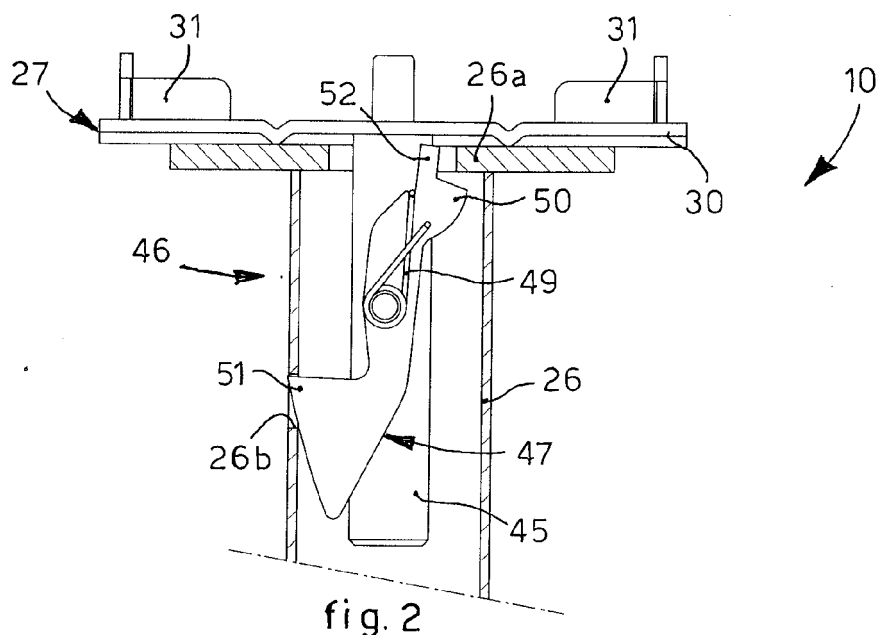


fig. 2

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a support device for a formwork for floors, which is made by the adjacent disposition of a plurality of modules, or grid-type frames, able to define a work surface with respect to which the floor is made. In particular, the support device according to the present invention provides at least a support head mounted by means of snap-in attachment mechanism, on a support strut of the support device, so as to keep the grid-type frames at a determinate height from the ground.

BACKGROUND OF THE INVENTION

[0002] Formworks to make floors are known, which are made by means of a plurality of grid-type frames of a substantially standardized size disposed adjacent to each other.

[0003] The grid-type frames are reciprocally attached and maintained at a determinate height by relative support devices, and their combination defines a work surface with respect to which the floor is made.

[0004] Known support devices normally comprise an upright or support strut resting on the ground, and a support head mounted on the upper part of the strut and provided with a supporting bracket on which the grid-type frames are positioned with their corners, in a quadrant disposition or other.

[0005] The mounting of the support head on the support strut is carried out by means of attachment mechanisms which, in order to guarantee a safe assembly, are normally specific and univocal, depending on the different types of struts and heads used.

[0006] Temporary attachment mechanisms are provided, with a pin, a joint or others, but these need a specific intervention in the assembly step as well, for example in order to insert the pin, which entails a lengthening of the assembly times and the possibility of mistakes in the clamping of the parts.

[0007] Moreover, known mounting mechanisms are laborious and need specific and reciprocal conformations of the heads and the struts, preventing any struts whatsoever from being used, for example any already in stock, in order to mount the support heads of the grid-type frames.

[0008] Known attachment mechanisms, moreover, do not always guarantee a secure impediment to the accidental detachment of the support head from the relative support strut.

[0009] From document US-A-5.651.914 a support device for modular elements for the building trade is known, like a formwork, provided with a support head having a snap-in tooth which can be used for the temporary support of a horizontal element for building constructions. The support head of US'914 has a single tooth on only

one side, and therefore the stresses it undergoes are often not balanced; moreover there can be rotational forces which are not wanted and which can create reciprocal movements and misalignments between adjacent elements.

[0010] Purpose of the present invention is to make a support device for a formwork for floors which is both simple and economic to make, as well as versatile in the assembly steps, thus solving the problems of the state of the art.

[0011] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0012] The present invention is set forth and characterized in the independent claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0013] In accordance with the above purpose, a support device according to the present invention is applied to support a formwork for floors, of the type made from a plurality of modules, or frames, disposed adjacent with respect to each other to define a work surface.

[0014] The support device according to the present invention comprises an upright element, or strut, resting on the ground and able to keep the frames at a determinate height from the ground.

[0015] The device according to the present invention also comprises a support head mounted on the strut and provided with a support bracket on which the frames are able to be directly disposed so as to be supported with respect to the ground.

[0016] According to a characteristic feature of the present invention, the support head comprises snap-in attachment means conformed so as to be constrained to the upright element, preventing the accidental detachment of the support head with respect to the upright element.

[0017] The snap-in attachment means comprise at least a first constraint tooth, disposed on a first side of the support head and movable between a first constraint position, in which it cooperates with an edge of the upright element in order to prevent the accidental detachment of the support head, and a second detachment position, in which it is released from the edge of the upright element and allows the detachment of the support head, and a second constraint tooth, disposed on the opposite side of the head with respect to the first constraint tooth, and this also having a first constraint position associated to the upright element and a second detachment position.

[0018] In this way, the support head is mounted on the upright element in a quick and secure way by selectively putting the constraint tooth or both the constraint teeth of the head in cooperation with the edge and/or with another part, for example the lateral surface of the upright

element. Therefore, the disassembly of the support head and the upright element occurs only by means of a voluntary action to release the first tooth from the edge, and possibly the second tooth from the lateral surface, of the upright element, substantially eliminating the risk of accidental disassembly of the parts.

[0019] With the present invention therefore, with a simple and economic solution, the assembly operations of the support head on the upright element are facilitated and rendered more secure, thus reducing assembly times and costs of the whole formwork to which the support device is normally applied.

[0020] Moreover, as the first constraint tooth is conformed so as to cooperate with a simple edge of the upright element, no adaption or specific production of the upright element is needed. For this reason, with the solution according to the present invention it is possible to use substantially any upright element whatsoever, with considerable economic saving due to the supply of materials for the setting up of the formwork.

[0021] The presence of the second constraint tooth determines not only an axial anti-detachment constraint, but also a rotational constraint between the support head and the upright element which prevents misalignments and reciprocal movements.

[0022] Moreover, the presence of the two teeth allows a better and more distributed discharge of the support stresses.

[0023] According to a variant, the attachment means comprise an elastic element, disposed in cooperation with the constraint tooth, in order to maintain the latter normally in its constraint position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] These and other characteristics of the present invention will become apparent from the following description of some preferential forms of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 shows a partial lateral view of a formwork for floors to which a support device according to the present invention is applied;
- fig. 2 shows an enlarged detail of fig. 1, in a first operating position;
- fig. 3 shows an enlarged detail of fig. 1, in a second operating position;
- fig. 4 shows an application variant of fig. 2;
- fig. 5 shows a support device according to the present invention applied to a support head.

[0025] To facilitate comprehension, the same reference numbers have been used, where possible, to identify common elements in the drawings that are substantially identical. It is understood that elements and characteristics of one form of embodiment can conveniently be incorporated into other forms of embodiment without

further clarifications.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT

[0026] With reference to fig. 1 one of the possible forms of embodiment of a formwork 11 to make floors is shown in its entirety, in which a plurality of support devices 10 according to the present invention are provided.

[0027] In this case the formwork 11 is applied to make a support plane on which the floor is made, and is disposed to cover a work surface delimited by a plurality of structural building elements, not shown here, such as for example perimeter walls, columns or others.

[0028] Solely for descriptive purposes, the formwork 11 comprises a plurality of base modules, in this case frames generally indicated by the number 12 in fig. 1, which are maintained in a position raised from the ground by means of the support devices 10.

[0029] The support devices 10 according to the present invention are suitably disposed in the space defined by the structural building elements.

[0030] Each base module or frame 12 comprises a plurality of support bars 16, disposed substantially parallel and equidistant with respect to each other, and two transverse bars 17 disposed reciprocally connecting opposite ends of the support bars 16.

[0031] In the same formwork 11 different types of base frames 12 are provided, which are substantially equivalent from the structural point of view, and differ from each other in their overall size, which however remain modular.

[0032] Each support device 10 comprises a relative strut 26 and a support head 27, the latter mounted on an end of the relative strut 26.

[0033] In this case, the strut 26 is of the telescopic tubular type, so that it can be selectively adjusted in height, and, in some solutions, is associated at the lower part to a support tripod 29, so as to be positioned substantially vertical and stable with respect to the ground.

[0034] The support head 27 (figs. 2, 3, 4 and 5) comprises a support bracket 30, which comprises one or more positioning blocks 31, able to cooperate with the transverse bars 17, so as to define a stable positioning of the corresponding base frame 12 with respect to the strut 26.

[0035] The support head 17 also comprises an attachment portion 45, by means of which the support head 27 is mounted at the end of the strut 26.

[0036] The support head 27 comprises a snap-in attachment mechanism 46 suitable to constrain the support head 27 to the strut 26, substantially without any possibility of accidental detachment.

[0037] In particular the attachment mechanism 46 comprises a lever element 47 pivoted to the attachment portion 45, and a torsion spring 49 constrained both to the attachment portion 45 and also to the lever element 47, in order to keep the latter, normally, in an inclined condition, or in any case not parallel to the attachment portion 45.

[0038] The lever element 47 comprises a first constraint tooth 50 disposed on a first side, on the right in the case of the figure, made in proximity to an upper end of the lever element 47, and a second constraint tooth 51 disposed on a second side, opposite the first side, and made in proximity to a substantially lower end, and in any case below the position of the first tooth 50, of the lever element 47.

[0039] The lever element 47 also comprises a release portion 52, which protrudes from an upper end, and which allows the user to maneuver the lever element at will 47.

[0040] In particular, in an assembled condition of the support head 27 on the strut 26, the attachment portion 45 is inserted axially from one end of the strut 26. In this step, the lever element 47 is kept substantially parallel to the attachment portion 45, in order to keep the constraint teeth 50 and 51 inactive.

[0041] Once the attachment portion 45 is completely inserted, the lever element 47 is released so that, because of the effect of the action of the torsion spring 49, at least the first constraint tooth 50 moves into a condition of cooperation from the inside with an edge 26a of the strut 26.

[0042] In this condition, the detachment of the attachment portion 45 from the strut 26 is prevented and therefore the detachment of the support head 27 from the strut.

[0043] In the solutions shown, the strut 26 also comprises a through hole 26b made on its circular surface in proximity to the upper end.

[0044] In this case the second constraint tooth 51, when the attachment portion 45 is inserted, is thrust by the spring 49 to cooperate with the through hole 26b, so as to define a second constraint between the attachment portion 45 and the strut 26.

[0045] In particular, in this solution, the attachment of the second constraint tooth 51 and the through hole 26b also determines a reciprocal rotational constraint between the attachment portion 45 and the strut 26, as well as making the support stresses to which the attachment head 27 and the strut 26 are subjected with respect to the base frames 12 more uniform and distributed.

[0046] In particular, the presence of the two constraint teeth 50 and 51 is particularly advantageous in the case where the width of insertion of the support head 27 into the strut (that is, the aperture made in the upper edge 26a) is less than the internal width of the strut 26, as in the case shown in figs. 2-5. In this case the two teeth 50 and 51, once one is constrained below the edge 26a and the other to the hole 26b of the strut 26, generate a lever effect which ensures a stable support with an additional anti-rotation effect which guarantees a stable and reliable hold, even over time.

[0047] The support head 27 and the strut 26 are released by acting voluntarily on the release portion 52, so as to overcome the force of the spring 49, to rotate the lever element 47 and to release the two constraint teeth 50 and 51 from the respective edge 26a and hole 26b, so as to allow the attachment portion 45 to be extracted

from the strut 26.

[0048] It is clear that modifications and/or additions of parts may be made to the support device 10 as described heretofore, without departing from the field and scope of the present invention.

[0049] For example, it comes within the field of the present invention to provide, as in the case shown in fig. 5, that the bracket 30 is mounted selectively movable with respect to a central portion 32 of the support head and comprises a clamping mechanism 39, by means of which the bracket 30 itself is selectively kept in a first support position or in a second inactive position, which is at a lower level than the level in which it is in the support position.

[0050] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of support device for a formwork for floors, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Support device to support a formwork (11) for floors, provided with a plurality of modules (12), disposed adjacent to each other to define a work surface, said support device comprising an upright element (26) resting on the ground and able to keep said modules (12) at a determinate height, and a support head (27) mounted on said upright element (26), and provided with a supporting bracket (30) on which said modules (12) are able to be directly disposed, the support head (27) comprising snap-in attachment means (46) suitable to be constrained to said upright element (26), **characterized in that** said snap-in attachment means are provided with at least a first constraint tooth (50), disposed on a first side of the support head and movable between a first constraint position, in which it cooperates with an edge (26a) of said upright element (26) in order to prevent the detachment of said support head (27), and a second detachment position, in which it is unconstrained from said edge (26a) of the upright element (26) so as to allow the detachment of said support head (27), and with a second constraint tooth (51) disposed on the opposite side of the support head (27) with respect to the first constraint tooth (50), and this also having a first constraint position associated to the upright element (26), and a second detachment position.
2. Device as in claim 1, **characterized in that** the attachment means (46) comprise an elastic element (49), disposed in cooperation with the first constraint tooth (50) and with the second constraint tooth (51), so as to normally keep them in the first constraint

position.

3. Device as in any claim hereinbefore, **characterized in that** the attachment means (46) are mounted on an attachment portion (45) of the support head (27), by means of which said support head (27) is able to be mounted on said upright element (26). 5
4. Device as in claim 3, **characterized in that** the attachment means (46) comprise at least a lever element (47) on which at least the first constraint tooth (50) and the second constraint tooth (51) are made, and pivoted to the attachment portion (45) of the support head (27). 10 15
5. Device as in claims 2 and 4, **characterized in that** the elastic element (49) is operatively associated to the lever element (47) so as to induce an elastic movement thereof between the constraint position and the detachment position. 20

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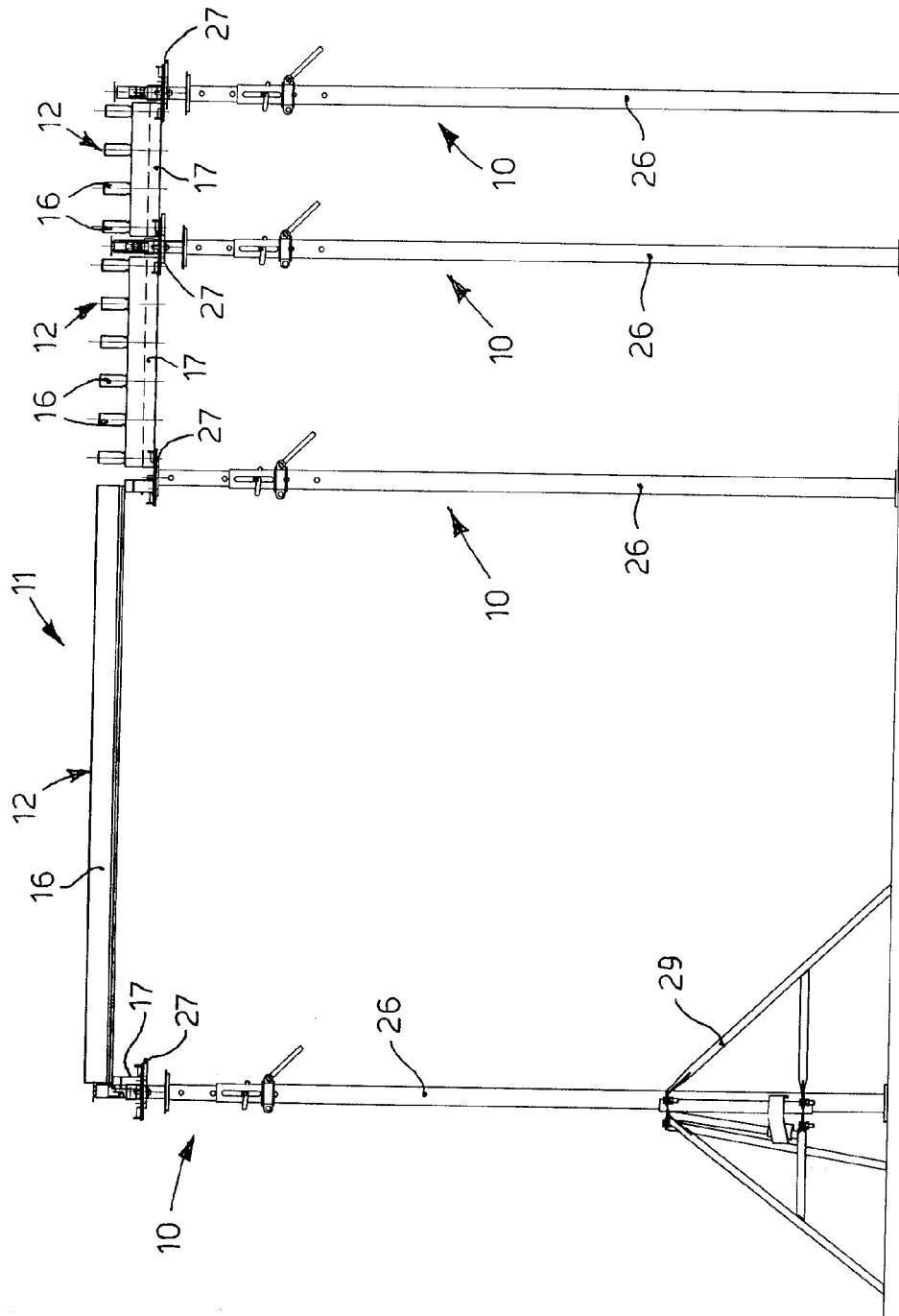
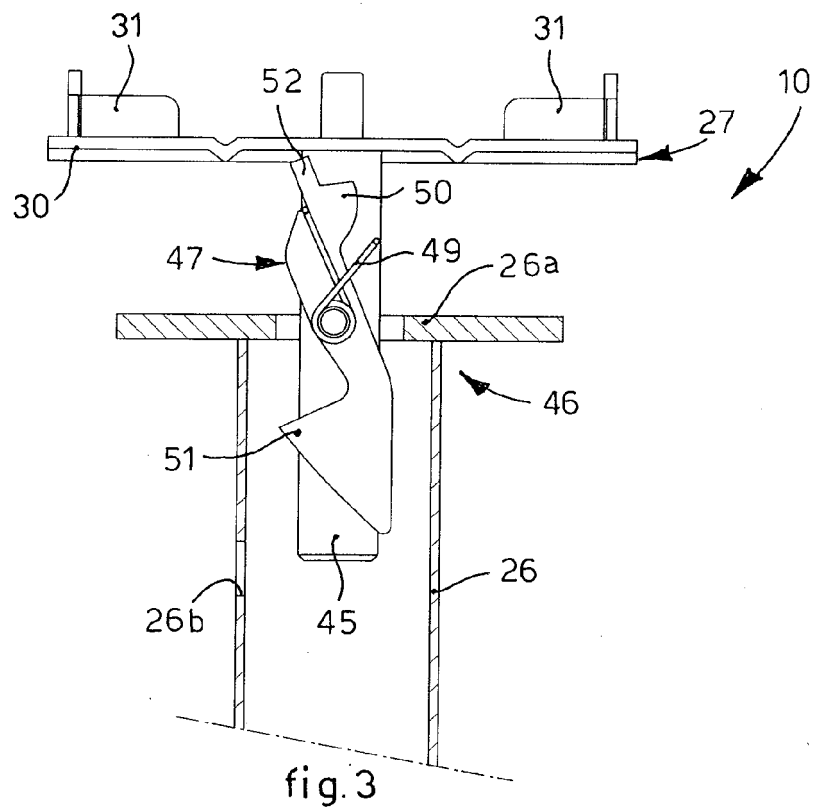
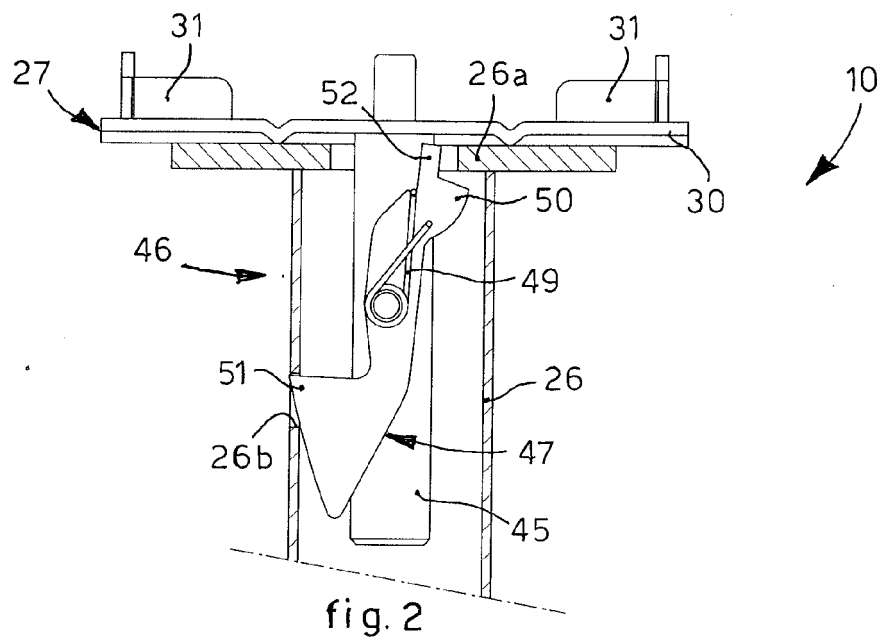
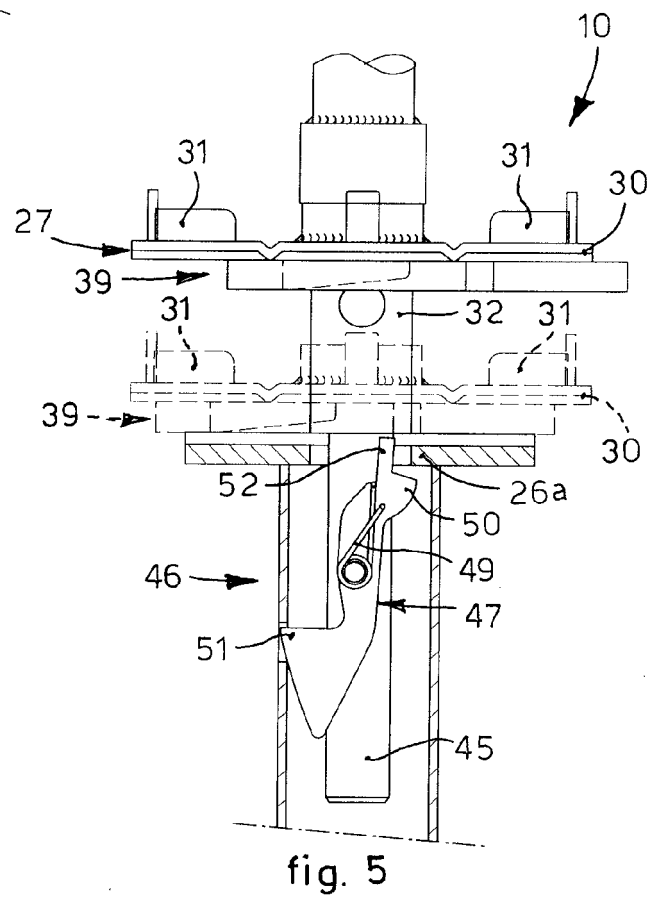
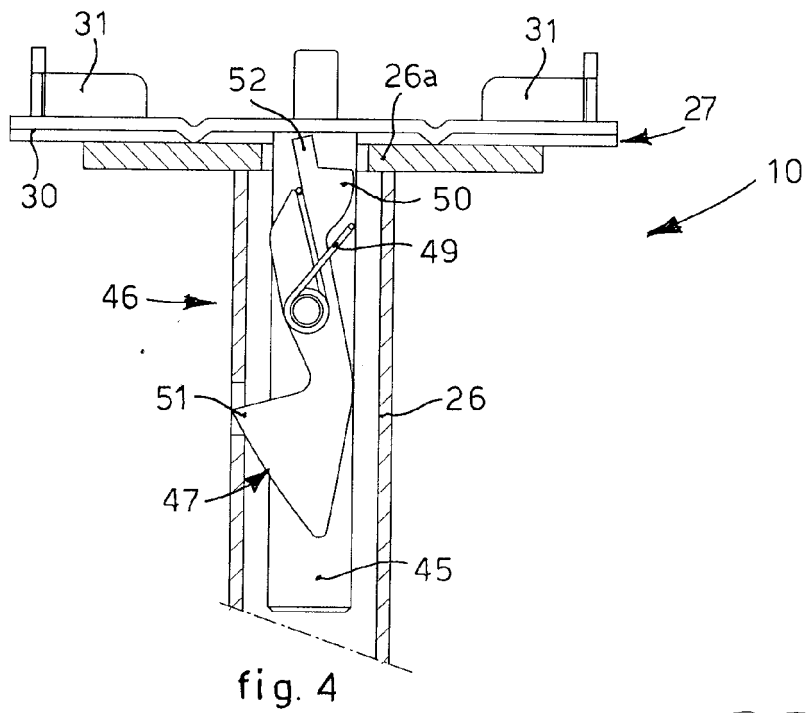


fig. 1







EUROPEAN SEARCH REPORT

Application Number
EP 11 15 8470

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 5 651 914 A (SCHWOERER ARTUR [DE]) 29 July 1997 (1997-07-29) * column 1, lines 38-47; figures 1,2,3 * * column 3, line 19 - column 4, line 12 * -----	1-5	INV. E04G11/48
A	DE 103 24 022 A1 (PERI GMBH [DE]) 16 December 2004 (2004-12-16) * paragraphs [0045] - [0050] * -----	1	
A	DE 10 2005 022316 A1 (HUENNEBECK GROUP GMBH [DE]) 23 March 2006 (2006-03-23) * paragraph [0032]; figure 6 * -----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E04G
Place of search		Date of completion of the search	Examiner
Munich		19 July 2011	Saretta, Guido
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 15 8470

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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19-07-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5651914 A	29-07-1997	AT 137294 T	15-05-1996
		DE 4237514 A1	11-05-1994
		WO 9411595 A1	26-05-1994
		EP 0670945 A1	13-09-1995
		ES 2089852 T3	01-10-1996
		JP 8503038 T	02-04-1996
		JP 3349701 B2	25-11-2002

DE 10324022 A1	16-12-2004	NONE	

DE 102005022316 A1	23-03-2006	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5651914 A [0009]