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(54) **AN ACCESSORY FOR SUPPORTS OF SHUTTER ELEMENTS**

(57) An accessory for construction props (2) for supporting floor laying elements (C) or the like, comprising: a first plate (3) which can be operatively coupled to the head of a prop (2); a second plate (4) to which a floor laying element (C) is operatively coupled; a coupling hinge (20) of a first portion (21) of the perimeter of the first plate (3) with a corresponding portion (22) of the

perimeter of the second plate (4) so as to allow them to mutually rotate according to a rotation axis (X) identified by the hinge (20); a movement unit (25) of the second plate (4) with respect to the first plate (3) according to the rotation axis (X) so as to open out the plates (3, 4) according to the hinge (20); a stop element of the movement unit (25) to keep the opening width stable.

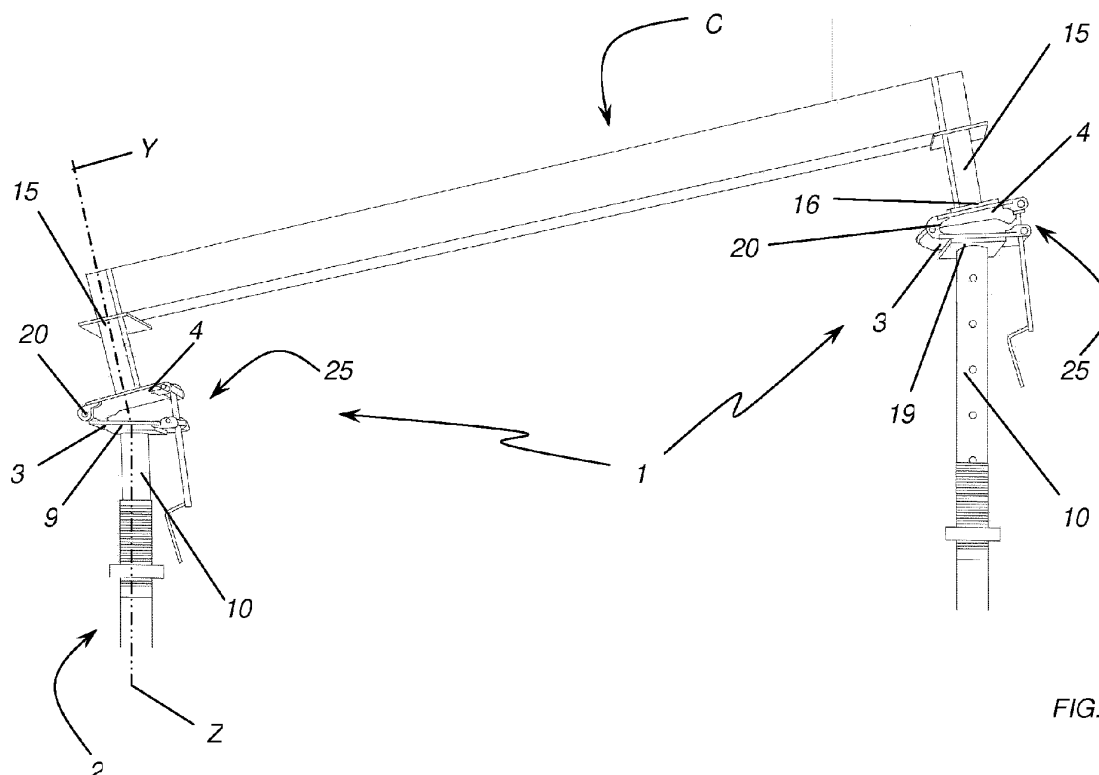


FIG. 1

Description

Field of application

[0001] The present invention is applicable to the sector of the equipment for construction industry and, particularly, relates to equipment for supporting floors during construction.

[0002] More in detail, the present invention relates typically, but not necessarily, to props employed to support a formwork used for making a floor.

State of the art

[0003] During the construction of buildings or structures of several floors, a significant element which is not simple to realize is represented by floors.

[0004] Being horizontal elements having most of the surface suspended, their laying needs the use of effective support elements.

[0005] Typically, the floors are realized using a formwork which has the purpose of supporting the floor itself during laying and solidification. However, it also acts as a safety element for the workers before and during the laying itself.

[0006] The formwork is typically placed on metal cylindrical props normally used in construction industry to support objects or parts of the building. Normally these props can be extended or shortened to adapt them to the need and are composed of a trunk having two cylindrical bodies shaped to slidably interpenetrate. Moreover, there are stops to adjust the extension of the trunk to a desired size.

[0007] At the head of the trunk there is a supporting body of the construction (typically consisting of a plate or a horizontal beam), while its ground support is typically stabilized by means of a pedestal.

[0008] It is often necessary to create a non-horizontal floor, characterized by a predetermined degree of slope. In these cases, a specially designed wedge must be associated with the props so as to obtain the desired slope degree. Since this slope degree is variable according to the case, it is evident that a first drawback of this solution is represented by the need to realize by hand the wedges according to specific requirements, increasing the overall construction costs as well as the times.

[0009] The handmade realization also requires expertise to ensure the correct inclination degree and to ensure that all the necessary wedges are identical.

[0010] The handmade realization also makes the obtained overall support unsafe and, therefore, dangerous.

[0011] To overcome this drawback in the state of the art, it is often necessary to replace the formwork with special trusses which, however, lower the safety degree of the workers before and during the laying of the floor.

Presentation of the invention

[0012] The object of the present invention is to over-

come at least partially the drawbacks highlighted above by providing construction props which allow to create floors with the desired inclination degree, while continuing to use a formwork.

[0013] Another object is that these props maintain a high safety and stability degree for the workers.

[0014] A further purpose is that the props themselves allow to vary the inclination degree of the floor at will, without, however, requiring handmade realization of additional elements or improvised or handmade adaptations.

[0015] Said objects, as well as others which will be better understood below, are achieved by an accessory for construction props in order to support floor laying elements or the like according to one or more of the following claims which are to be considered an integral part of the present patent.

[0016] In particular, the accessory comprises at least a first plate which can be operatively coupled to the head of a prop and at least a second plate which can be operatively coupled with a floor laying element.

[0017] Then there is at least a coupling hinge of a first portion of the perimeter of the first plate with a corresponding first portion of the perimeter of the second plate so as to allow them to mutually rotate according to a rotation axis identified by the hinge.

[0018] In other words, the two plates are hinged so as to be able to mutually rotate according to a rotation axis identified by the hinge itself. In this way, the two plates open out from a closed position, where they are arranged parallel and in mutual contact, to opened operating positions.

[0019] In order to obtain and adjust this movement, the accessory of the invention also comprises at least one movement unit of the second plate with respect to the first.

[0020] Then, there is at least one stop element of the movement unit to stabilize the width of the desired opening.

[0021] Therefore, this opening allows to obtain an inclination angle of the orthogonal axis to the second plate with respect to the axis identified by the prop which is coupled to the accessory.

[0022] Accordingly, advantageously, it is possible to incline the formwork arranged above the props and coupled thereto by the accessory of the invention.

[0023] Still advantageously, this inclination can be adjusted at will in order to obtain a floor with the desired inclination and, in any case, using a formwork. In particular, it is possible to move between a formwork position parallel to the ground (wherein the plates are closed and overlapping each other) and inclined positions wherein the plates are opened out. This corresponds, advantageously, to the use of the accessory even when no inclination is necessary.

[0024] Moreover, a high safety and stability degree for the workers is still advantageously maintained.

[0025] All this is obtained, advantageously, without the

need to realize by hand additional elements or improvised adaptations.

[0026] From the above, it is evident that said objects are also achieved by a construction prop for supporting floor laying elements or the like, comprising:

- at least a first substantially cylindrical trunk provided with a ground supporting unit;
- at least a first plate operatively coupled to the head of said trunk;
- at least a second plate arranged above said first plate;
- at least one coupling hinge of a first portion of the perimeter of said first plate with a corresponding first portion of the perimeter of said second plate so as to allow them to mutually rotate according to a rotation axis identified by said hinge between a closed position, where the first and second plates are arranged parallel and in mutual contact, and operating positions where the first and second plates are opened out;
- at least one movement unit of said second plate with respect to said first plate according to said rotation axis so as to open out said plates according to said hinge;
- at least one stop element of said movement unit to keep the width of said opening stable;
- at least a second trunk, the base of which is firmly coupled to said second plate and a head which is operatively coupled to a floor laying element.

Brief Description of the Drawings

[0027] Further features and advantages of the invention will be more apparent in light of the detailed description of a preferred, but not exclusive, embodiment of an accessory for construction props in order to support floor laying elements or the like, according to the invention, illustrated by way of non-limiting example with the aid of the accompanying drawing tables, wherein:

- FIG. 1 represents an accessory according to the invention in an operating step;
- FIG. 2 represents the accessory of FIG. 1 in an operating sequence.

Detailed description of some preferred embodiment example

[0028] With reference to the aforementioned figures, and in particular to figs. 1 and 2, it is described an accessory **1** particularly suitable for being coupled to construction props **2**. In particular, the accessory **1** is configured to be advantageously usable together with the aforementioned props **2** for supporting floor laying elements **C** or the like. Typically, these laying elements **C** consist of a formwork, but such aspect must not be considered as limiting for the invention.

[0029] The accessory **1** comprises a first plate **3** which can be operatively coupled to the head of the prop **2** and a second plate **4** which can be operatively coupled to a floor laying element **C**.

[0030] The known props **2** typically comprise a first substantially cylindrical trunk **5** provided, although not shown in the figures, with a ground supporting unit.

[0031] Moreover, the first trunk **5** is typically extensible, being constituted by a pair of cylindrical bodies **7** shaped to slidably interpenetrate. In this way it is possible to easily adjust the extension or shortening of the prop **2** and, consequently, the height of the point of the floor which it supports.

[0032] With regard to the ground supporting unit, it conveniently comprises a pedestal coupled to the trunk **5**. Obviously, this aspect must not be considered as limiting for the invention since the pedestal can easily be replaced with any other ground supporting unit of the prop. Likewise, also the described embodiment of the first trunk **5** of the prop **2** must not be considered as limiting for the invention.

[0033] With regard to the coupling between the first plate **3** and the first trunk **5**, according to the embodiment described, it is performed by the interposition of a third plate **9** welded to the head **10** of the first trunk **5**. The two plates **3** and **9** are arranged facing each other and kept coupled by screw means. However, also this detail on the coupling between the first plate **3** and the first trunk **5** must not be considered as limiting for different embodiments of the invention.

[0034] In the figures it is also observed that the second plate **4** is coupled with the floor laying element **C** through the interposition of a second trunk **15**.

[0035] Similarly to the case of the first plate **3** and of the first trunk **5**, the coupling between the second trunk **15** and the second plate **4** occurs by the interposition of a fourth plate **16** typically, but not necessarily, welded to the base of the second trunk **15** and coupled by screw means to the second plate **4**.

[0036] According to an aspect of the invention, the accessory **1** also comprises a hinge **20** for coupling a first portion **21** of the perimeter of the first plate **3** with a corresponding portion **22** of the perimeter of the second plate **4**.

[0037] In this way, advantageously, they are free to mutually rotate according to a rotation axis **X** identified by the hinge **20** between a closed position, where the first **3** and the second plates **4** are arranged parallel and in mutual contact, and operating positions where the two plates **3** and **4** are opened out.

[0038] In the figures it is observed that the first **3** and second plates **4** have a polygonal perimeter. In this sense, the first portion **21** of the perimeter of the first plate **3** consists of one side of the polygon and, similarly, the corresponding portion **22** of the perimeter of the second plate **4** consists of a corresponding side of the polygon. However, even this aspect must not be considered as limiting for different embodiments of the invention where,

e.g., the perimeters of the two plates may be different from each other and mixitilinear.

[0039] In any case, the rotation between the first **3** and second plates **4** according to the hinge **20** allows to open them out. This opening, advantageously, makes it possible to rotate the development axis **Y** of the second trunk **15** with respect to the development axis **Z** of the first trunk **5** between coinciding directions (wherein the plates **3** and **4** are closed and overlapped on each other) and incident directions wherein the plates are opened out. This corresponds, advantageously, to the variation of the inclination angle of the floor laying element **C** with respect to the ground of an angle determined by the degree of opening of the plates **3** and **4**.

[0040] Therefore, still advantageously, the floor inclination thus obtained can be any inclination without having to realize by hand further elements to be added to the props **2** and without having to make carpentry, wood-working or other modifications. However, in the absence of inclination, the accessory **1** must not be removed because its closure corresponds to the arrangement parallel to the ground of the laying element **C**.

[0041] Moreover, still advantageously, the possibility of extending or shortening at will the props **2** allows to use a formwork in the best stability conditions with an optimal adjustment of its inclination.

[0042] So far, it has been said that the first **3** and the second plates **4** can be freely opened out. However, it is evident that once the opening angle (and also the inclination angle of the formwork) has been chosen, it is necessary to stabilize the accessory **1**, i.e. to stop this opening.

[0043] For this reason, according to another aspect of the invention, the accessory **1** comprises a movement unit **25** of the second plate with respect to the first plate according to the rotation axis **X** identified by the hinge **20**, and a stop element of the movement unit **25** to stabilize the opening width.

[0044] According to the embodiment of the invention described, the movement unit **25** comprises a first body **30** rotatably pivoted to the second plate **4** and a second body **31** provided with a slot **32** and rotatably coupled to the first plate **3**.

[0045] Then, there is a shaft **33** which engages the slot **32** of the second body **31** and is firmly coupled to the first body **30**. In this way, advantageously, the sliding of the shaft **33** in the slot **32** leaves the position of the first plate **3** unchanged, while inducing a movement on the second plate **4** modifying their opening. The rotating couplings of the first **30** and second bodies **31** allow to mechanically manage the inclination variation of the shaft **33** with respect to the plates **3** and **4**.

[0046] According to a further aspect of the invention, the shaft **33** has a cylindrical body, the side surface of which is threaded. At the same time, the slot **32** has the internal surface counter-threaded to be coupled through screwing with the shaft **33** and the latter is rotatably coupled to the first body **30**.

[0047] Advantageously, therefore, the mutual sliding is easily obtained by screwing the shaft **33** into the slot **32**. Still advantageously, this allows a fine control of the opening angle between the first **3** and the second plates **4**.

[0048] Still advantageously, the stop element is thus constituted by the contrast between the threading of the shaft **33** and the counter-threading of the slot **32**.

[0049] Also in this case, obviously, the described embodiment of the movement unit and of the stop element must not be considered as limiting for the invention.

[0050] For what has been said so far, it is clear that the object of the invention is also a construction prop **2** for supporting floor laying elements **C** or the like.

[0051] It comprises at least a first substantially cylindrical trunk provided with a ground supporting unit. There are also a first plate **3** operatively coupled to the head of the first trunk **5**, and a second plate **4** arranged above the first plate **3**.

[0052] The two plates are joined by a coupling hinge **20** which involves a first portion **21** of the perimeter of the first plate **3** and a corresponding portion **22** of the perimeter of the second plate **4** so that said plates **3** and **4** are free to mutually rotate according to the rotation axis **X** identified by the hinge **20**.

[0053] Then, there is a movement unit **25** of the second plate **4** with respect to the first plate **3** according to the rotation axis **X** so as to open them out, and a stop element of the same movement unit to stabilize the opening width.

[0054] Finally, there is a second trunk **15**, the base of which is firmly coupled with the second plate **4** and the head of which can be operatively coupled with a floor laying element **C**.

[0055] A punctual description of the prop **2** of the invention is avoided here since it replicates what has been already said for the accessory **1**.

[0056] In light of the foregoing, it is therefore understood that the accessory and the prop of the invention achieve the desired objects.

[0057] In particular, they allow to realize floors with the desired inclination degree, continuing to use a formwork while maintaining a high safety and stability degree for the workers.

[0058] They also allow to vary the inclination degree of the floor at will, without, however, requiring handmade realization of additional elements or improvised or handmade adaptations.

[0059] The invention might be subject to many changes, which are all included in the appended claims. Moreover, all the details may furthermore be replaced by other technically equivalent elements, and the materials may be different depending on the needs, without departing from the scope of protection of the invention defined by the appended claims.

Claims

1. An accessory for construction props (2) for supporting floor laying elements (C) or the like, comprising:
 - at least a first plate (3) which can be operatively coupled to the head of a prop (2);
 - at least a second plate (4) to which a floor laying element (C) is operatively coupled;
 - at least one coupling hinge (20) of a first portion (21) of the perimeter of said first plate (3) with a corresponding portion (22) of the perimeter of said second plate (4) so as to allow them to mutually rotate according to a rotation axis (X) identified by said hinge (20) between a closed position, wherein said first (3) and second plates (4) are arranged parallel and in mutual contact, and operating positions where said first (3) and second plates (4) are opened out;
 - at least one movement unit (25) of said second plate (4) with respect to said first plate (3) according to said rotation axis (X) so as to open out said plates (3, 4) according to said hinge (20);
 - at least one stop element of said movement unit (25) to keep stable the width of said opening.
2. Accessory according to claim 1, **wherein** said movement unit (25) comprises:
 - a first body (30) rotatably pivoted to said second plate (4);
 - at least a second body (31) provided with at least one slot (32) and rotatably coupled to said first plate (3);
 - at least one shaft (33) which engages said slot (32) of said second body (31) and is firmly coupled to said first body (30) so as to rotate said second plate (4) with respect to said first plate (3) according to said rotation axis (X) when said shaft (33) is moved with respect to said slot.
3. Accessory according to claim 2, **wherein**:
 - said shaft (33) has a cylindrical body, the side surface of which is threaded;
 - said slot (32) has an internal counter-threaded surface to couple through screwing with said shaft (33);
 - said shaft (33) is rotatably coupled to said first body (30).
4. Accessory according to claim 2 or 3, **wherein** said stop element consists of the contrast between said thread of said shaft (33) and said counter-threading of said slot (32).
5. Accessory according to any one of the previous claims, **wherein** said first (3) and second plates (4) have a polygonal perimeter, said first portion (21) of said perimeter of said first plate (3) consisting of a side of said polygonal perimeter, said corresponding portion (22) of said perimeter of said second plate (4) consisting of a corresponding side of said polygonal perimeter.
6. A construction prop for supporting floor laying elements (C) or the like comprising:
 - at least a first substantially cylindrical trunk (5) provided with a ground supporting unit;
 - at least a first plate (3) operatively coupled to the head of said first trunk (5);
 - at least a second plate (4) arranged above said first plate (3);
 - at least one coupling hinge (20) of a first portion (21) of the perimeter of said first plate (3) with a corresponding portion (22) of the perimeter of said second plate (4) so as to allow them to mutually rotate according to a rotation axis (X) identified by said hinge (20) between a closed position, wherein said first (3) and second plates (4) are arranged parallel and in mutual contact, and operating positions where said first (3) and second plates (4) are opened out;
 - at least one movement unit (25) of said second plate (4) with respect to said first plate (3) according to said rotation axis (X) so as to open out said plates (3, 4) according to said hinge (20);
 - at least one stop element of said movement unit (25) to keep the width of said opening stable;
 - at least a second trunk (15), the base of which is firmly coupled to said second plate (4) and the head of which can be operatively coupled to a floor laying element (C).
7. Construction prop according to claim 6, **wherein** said first trunk (5) comprises at least a pair of cylindrical bodies (7) shaped to slidably interpenetrate so as to allow the extension or shortening of said first trunk (5).
8. Construction prop according to claim 6 or 7, **wherein** said ground supporting unit comprises at least one pedestal coupled to said trunk (5).
9. Construction prop according to any one of the claims 6 to 8, **wherein** said first plate (3) is coupled to said first trunk (5) by the interposition of a third plate (9) welded to the head of said first trunk (5) and coupled by screw means to said first plate (3).
10. Construction prop according to any one of the claims 6 to 9, **wherein** said second trunk (15) is coupled to said second plate (4) by the interposition of a fourth

plate (16) welded to the base of said second trunk (15) and coupled by screw means to said second plate (4).

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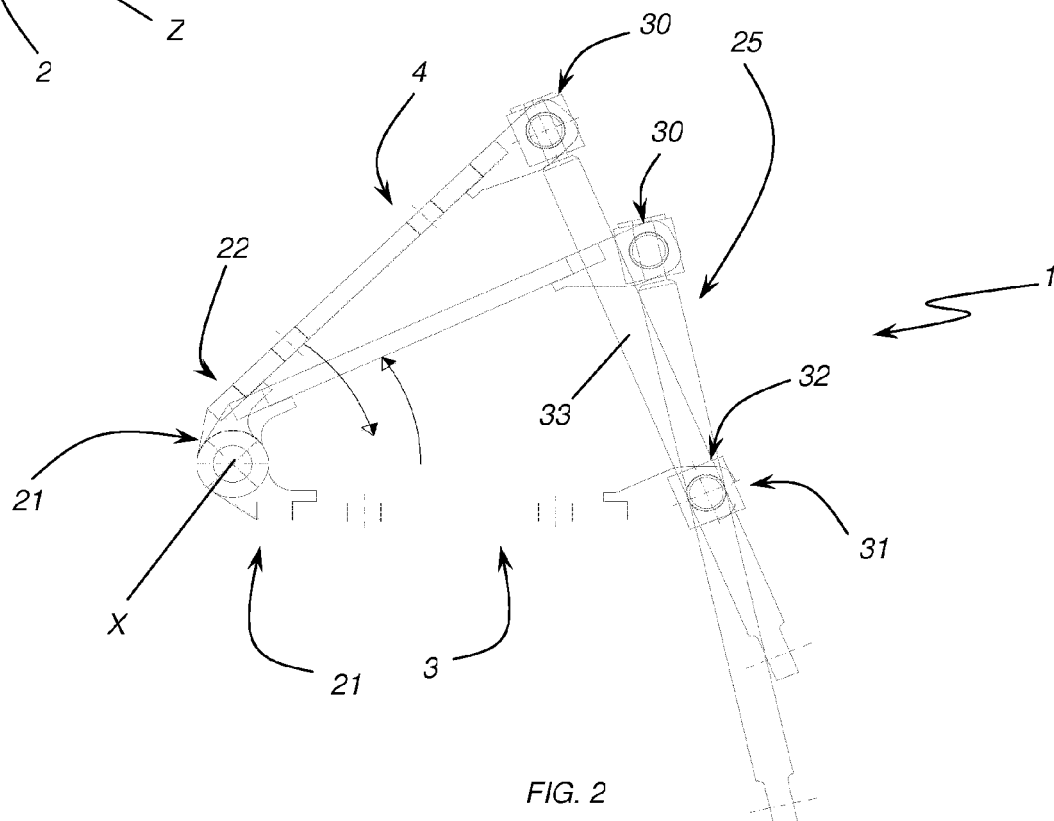
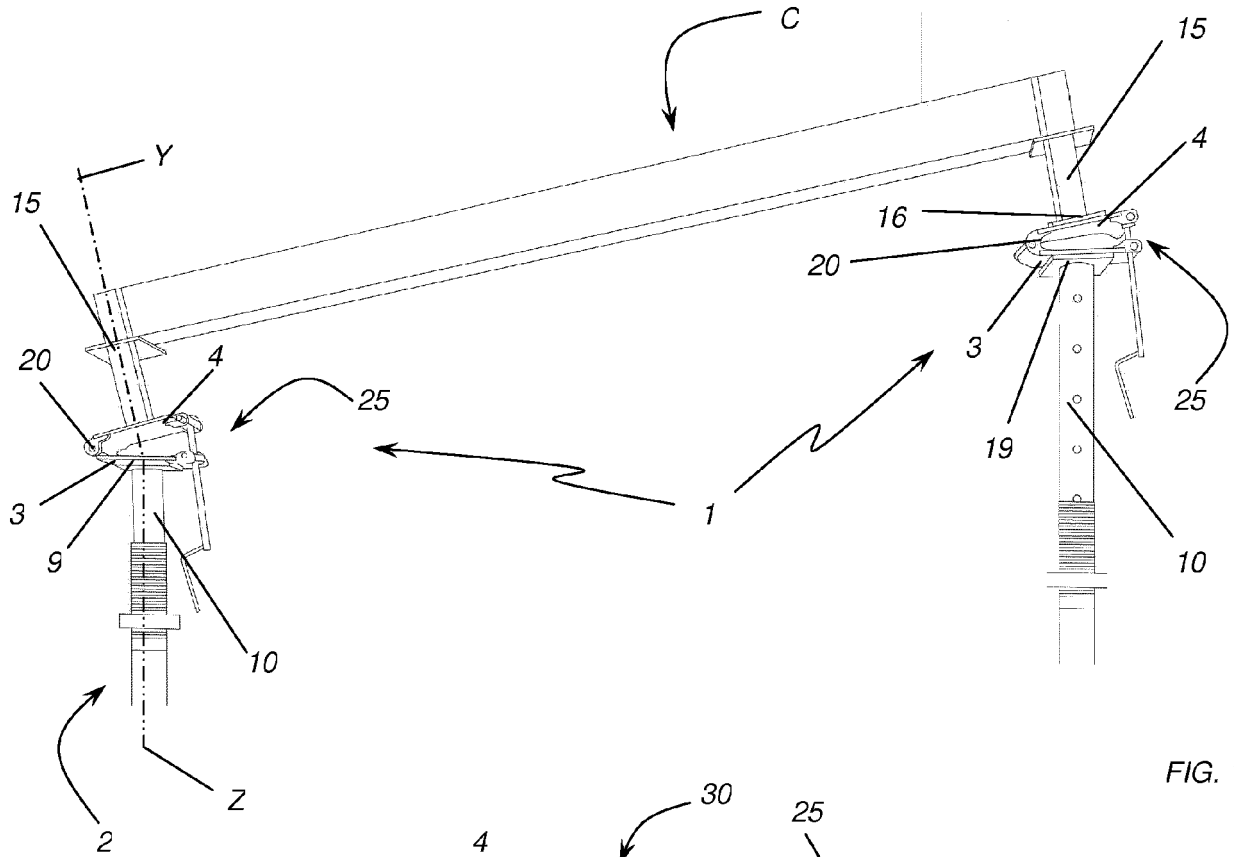
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EUROPEAN SEARCH REPORT

Application Number
EP 18 16 2907

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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)
X	US 6 273 662 B1 (FLECKENSTEIN MARK A [US]) 14 August 2001 (2001-08-14) * column 2 - column 3; figure 4 *	1-10	INV. E04G11/48 F16M11/10 E04G25/00
X	JP H11 50676 A (NICHIMEN CO LTD; SHINOZAKI KOSAKUSHO KK) 23 February 1999 (1999-02-23) * abstract; figures 1-8 *	1-5	
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A	----- US 2012/042600 A1 (BACON DAVID L [US]) 23 February 2012 (2012-02-23) * figures 1,2,5 *	6-10	TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 May 2018	Examiner Manera, Marco
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

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

EP 18 16 2907

5 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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