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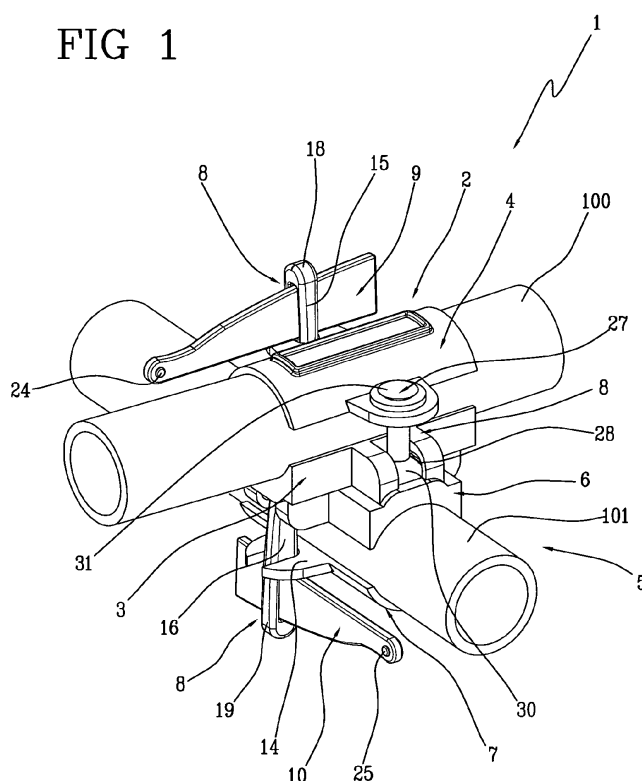
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(54) **Joint for installation of scaffolding tubes, and scaffold comprising said joint**

(57) A joint for installation of scaffolding tubes, comprises a first (2) and a second (5) body, each divided into a first (3, 6) and a second (4, 7) half for engaging two tubes (100, 101) of the scaffold, clamping means (8) acting between the first (3, 6) and second (4, 7) halves for moving them close to each other thus clamping the scaffolding tubes. The clamping means (8) comprises at least two wedge-shaped bodies (9, 10) that are slidable within

respective slots (11, 12), for acting on the second half (4, 7) and achieving a plurality of approached positions of the second half (4, 7) relative to the first one (3, 6) depending on the penetration degree of the wedge-shaped body (9, 10) into the slot (11, 12). Each slot (11, 12) and each wedge-shaped body (9, 10) are movable for obtaining at least two distinct insertion ways of the wedge-shaped body relative to the respective second half.

FIG 1



Description

[0001] The present invention relates to a joint for installation of scaffolding tubes, and a scaffold comprising such a joint.

[0002] The present invention preferably, although not exclusively, takes its place in the building field, where scaffolds are used for construction and/or renovation of buildings. Application of the present invention also occurs, for example, in the manufacture of lattice structures adapted to temporarily support terraces, stands, covering elements and the like.

[0003] Scaffolds are formed with a plurality of tubes connected to each other by joints.

[0004] The known art joints generally comprise two sleeves fastened to each other, in which each sleeve retains a respective tube. In order to removably tighten the joints on the tubes each sleeve is divided into two halves that are made integral with each other by bolts and nuts. In particular, by encircling the tube with the two sleeve halves and subsequently screwing down the nuts on the bolts, the two halves are tightened or clamped on the tube, retaining it in place.

[0005] While these types of joints work very well, they however have some drawbacks. In particular, it may happen that the bad-weather conditions to which the joints are exposed (note that usually scaffolds are used outdoors) will cause decay of the mechanical properties of the joints themselves, due to oxidation or repeated heat cycles.

[0006] Under this situation, the operator charged with mounting of the scaffold tends to only replace the bolts and nuts, therefore taking into account the possibility of re-using the same joint, which however is no longer efficient. This operation represents a risk for the efficiency and safety of the whole scaffolding.

[0007] In addition, it may happen that access to the bolts and nuts for clamping the joint halves on the scaffolding tubes cannot take place easily. For instance, in case the scaffold is very near a wall it is not always possible to operate the spanner for screwing down the nut on the bolt, because the spanner (or the tool used for screwing of the bolt) could interfere with the wall. In these cases repositioning of the joint is required, so as to have the necessary room for correct installation, to the detriment of an optimal positioning of the joint.

[0008] In this context, the technical task underlying the present invention is to propose a joint for installation of scaffolding tubes and a scaffold comprising such a joint, adapted to overcome the above mentioned drawbacks of the known art.

[0009] In particular, it is an aim of the present invention to make available a joint for installation of scaffolding tubes and a scaffold including such a joint capable of ensuring the structural integrity of the joint when used.

[0010] It is a further aim of the present invention to propose a joint for installation of scaffolding tubes and a scaffold including such a joint that can be installed under

optimal conditions even in the vicinity of walls or obstacles.

[0011] The technical task mentioned and the aims specified are substantially achieved by a joint for installation of scaffolding tubes and a scaffold including such a joint, comprising the technical features set out in one or more of the appended claims.

[0012] Further features and advantages of the present invention will become more apparent from the description of a preferred but not exclusive embodiment, given by way of non-limiting example, of a joint for installation of scaffolding tubes and a scaffold including such a joint, as illustrated in the accompanying drawings, in which:

- Fig. 1 is a perspective view of a joint for installation of scaffolding tubes in accordance with the present invention;
- Fig. 2 shows the joint seen in Fig. 1 in a different operating configuration;
- Fig. 3 shows the joint in Fig. 1 in an operating step for installation; and
- Fig. 4 is a further perspective view of the joint seen in Fig. 1 in a further operating step for installation.

[0013] A joint for installation of scaffolding tubes in accordance with the present invention has been generally denoted by numeral 1.

[0014] Joint 1 comprises a first body 2 divided into a first half 3 and a second half 4 for engagement of a first scaffolding tube 100.

[0015] Joint 1 further comprises a second body 5 also divided into a first half 6 and a second half 7 for engagement of a second scaffolding tube 101. The first halves 3, 6 of the two bodies 2, 5 are secured to each other.

[0016] In the preferred embodiment of the invention, as shown in the accompanying drawings, the two first halves 3, 6 of the two bodies 2, 5 are of one piece construction, i.e. they are made of a unitary piece. In addition they are coupled to each other in such a manner that the engaged scaffolding tubes are oriented to each other so as to substantially form a right angle.

[0017] In alternative embodiments, the two first halves 3, 6 of the two bodies 2, 3 can be physically distinct parts joined by a hinge or other device adapted to enable mutual rotation of the two halves 3, 6.

[0018] In addition the scaffolding tubes concerned with the two bodies 2, 5 can be such oriented to each other as to form any type of angle.

[0019] Preferably, the two halves of each body comprise a respective inner surface (shown in Fig. 4 is the inner surface of the first half 3 of the first body 2), i.e. the surface designed to come into direct contact with the scaffolding tube, which is of semicylindrical shape, so that said halves substantially match the shape of the tube (usually of cylindrical shape).

[0020] Clamping means 8 is present between the first halves 3, 6 and the second halves 4, 7 of each body 2, 5. The clamping means 8 function is to make the second

halves approach the first halves thus encircling a respective scaffolding tube, in such a manner that the two scaffolding tubes are retained by the two bodies 2, 5.

[0021] Advantageously, the clamping means 8 comprises at least two substantially wedge-shaped bodies 9, 10 which are slidable relative to the second halves 4, 7 inside respective slots 11, 12 (the latter being clearly shown in Fig. 3). Each wedge-shaped body 9, 10 is active on the second half 4, 7 of the respective body 2, 5 for achieving a plurality of approached positions between the second half 4, 7 and the first half 3, 6, depending on the penetration degree of the wedge-shaped body 9, 10 into slot 11, 12. In other words, the wedge-shaped body 9 of the first body 2 is slidable within slot 11 of the first body and, depending on its relative position within slot 11, exerts a more or less intense force on the second half 4 moving it close to the first half 3 to a greater or lesser degree. To this aim, the wedge-shaped body 9 comes into contact with the second half 4 when it slides inside slot 11.

[0022] The greater the penetration degree of the wedge-shaped body 9 into slot 11 is, the stronger the force transmitted to the second half 4.

[0023] In particular, each wedge-shaped body 9, 10 comes into contact with a tailpiece 13, 14 secured to, and jutting out of the respective second half.

[0024] The above is valid in the same manner also for the wedge-shaped body 10 in relation to the second body 5.

[0025] In addition, each slot 11, 12 and each wedge-shaped body 9, 10 is movable relative to the respective second half 4, 7 (see Figs. 3 and 4) so as to obtain at least two distinct insertion directions of the wedge-shaped body 9, 10 relative to the respective second half 4, 7 (Fig. 1 shows an insertion direction of the wedge-shaped bodies relative to the respective second halves and Fig. 2 shows an opposite insertion direction).

[0026] In other words, each wedge-shaped body 9, 10 sliding within the respective slot 11, 12 and the slot 11, 12 itself are movable relative to the respective second half in such a manner that the insertion direction of the wedge-shaped body into the slot relative to the second half (i.e. the penetration direction of the wedge-shaped body into the slot) can take at least two different positions (for instance, either from the right to the left as shown in Fig. 2 or from the left to the right, as shown in Fig. 1).

[0027] In this way, even in case of an obstacle making the penetration of the wedge-shaped body 9, 10 into slot 11, 12 impracticable in a specific direction, it is possible to re-orientate the slot and wedge-shaped body in a different and easier direction. Mounting of the joint on the scaffolding tube can be therefore carried out under optimal conditions also in the vicinity of walls or obstacles.

[0028] Joint 1 further comprises two pins 15, 16 each of which is provided with a slot 11, 12. Each pin 15, 16 is inserted in a hole formed in the first half 3, 6 and is provided with a limit element 17 in such a manner that it cannot thoroughly pass through the hole. In particular,

the limit element 17 has greater sizes than the hole. In the preferred embodiment of the invention, the limit element 17 is obtained through thickening of the pin 15, 16 section having a rounded shape so as to facilitate rotation of the pin 15, 16 relative to the hole formed in the respective half 3, 6. The limit element 17 is of one piece construction with the pin 15, 16.

[0029] Each pin 15, 16 comprises a first distal end 18, 19 relative to the hole present in the first half 3, 6 in which slot 11, 12 is formed. The first end 18, 19 is insertable in the tailpiece 13, 14 and at least partly emerges therefrom (see Figs. 1 and 2). It should be noted that the tailpiece 13, 14 has a fork-shaped configuration to enable introduction and removal of pin 15, 16 thereinto and therefrom respectively. The second end of pin 15, 16, i.e. the end opposite to the first one 18, 19, carries the limit element 17.

[0030] Advantageously, each wedge-shaped body 9, 10 comprises a first portion 20, 21 having greater sizes than the sizes of the corresponding slot 11, 12, in such a manner that this portion of the wedge-shaped body cannot fully pass through the slot.

[0031] In addition, each wedge-shaped body 9, 10 comprises a second portion 22, 23 that is substantially opposite to the first one 20, 21 and has smaller sizes than the slot. Acting on the second portion 22, 23 is a limit stop 24, 25 interfering with slot 11, 12 in such a manner that also the second portion 22, 23 cannot fully pass through slot 11, 12. In this way, the wedge-shaped body 9, 10 cannot be removed from its engagement with slot 11, 12.

[0032] In the preferred embodiment of the invention the limit stop 24, 25 is a rivet inserted in a hole formed in the second portion 22, 23 of the wedge-shaped body 9, 10 which is submitted to plastic deformation in such a manner that it cannot be removed from the hole.

[0033] It should be noted that the irremovable character of the wedge-shaped body from the slot makes pin 18, 19 too irremovable from the hole in the first half of the body.

[0034] The clamping means 8 further comprises two connections 26, 27 each of which extends between the respective first 3, 6 and second 4, 7 half of each body. The two connections 26, 27 are disposed on opposite sides on the first and second halves relative to pins 15, 16 provided with slot 11, 12, so as to fasten the first halves 3, 6 and second halves 4, 7 to each other.

[0035] Each connection 26, 27 is inserted in eyes 28, 29 of the first and second halves, in particular the connection being able to slide and rotate within each eye 28, 29. In this way, when the wedge-shaped body 9, 10 is not active on the second half 4, 7, the two halves of the body are secured to each other while they can at all events be mutually moved or shifted to enable easy installation of the joint on the scaffolding tube.

[0036] Advantageously, each connection 26, 27 comprises two limit stops 30, 31 placed on opposite ends of the connection itself to prevent it from slipping off the

eyes 28, 29. In particular the limit stops 30, 31 are of one piece construction with the connections and consist of thickened portions of the connection sections, obtained by moulding or plastic deformation of the connection end.

[0037] Note that joint 1 does not include any element that can be dismantled and installed again, such as bolts or nuts. In this way, it is practically impossible to only replace some components of the joint. Therefore, the structural integrity of the joint when in use is ensured, since a fault (due to wear, for example) of a single component of the joint cannot be remedied in a manner independent of the remaining part of the joint. In other words, in case of decay of the mechanical properties of a component of the joint making it useless, replacement of the whole joint is required.

Claims

1. A joint for installation of scaffolding tubes, comprising:

- a first body (2) divided into a first half (3) and a second half (4) for engaging a first tube (100) of the scaffold;
- a second body (5) divided into a first half (6) and a second half (7) for engaging a second tube (101) of the scaffold;
- the first halves (3, 6) of the first (2) and second (5) bodies being secured to each other;
- clamping means (8) to be activated by an operator, acting between said first (3, 6) and second (4, 7) halves for moving the second halves close to the respective first halves of said bodies (2, 5) in such a manner as to clamp said bodies to said first and second tubes of the scaffold;

characterised in that said clamping means (8) comprises at least two substantially wedge-shaped bodies (9, 10) that are slidable relative to said second halves (4, 7) within respective slots (11, 12), each wedge-shaped body (9, 10) acting on the second half (4, 7) of one of said bodies for achieving a plurality of approached positions of the second half (4, 7) to the first half (3, 6), depending on the penetration degree of the wedge-shaped body (9, 10) into the slot (11, 12), and **in that** each slot (11, 12) and each wedge-shaped body (9, 10) are movable relative to the respective second half (4, 7) for obtaining at least two distinct insertion ways or directions of the wedge-shaped body relative to respective second half.

2. A joint as claimed in claim 1, comprising two pins (15, 16), each of which is provided with one of said slots (11, 12), each pin (15, 16) being inserted in a hole formed in said first half (3, 6) of the body and provided with a limit element (17) in such a manner that it cannot fully pass through said hole.

3. A joint as claimed in claim 2, wherein each pin (15, 16) comprises a first end (18, 19) opposite to said hole which is provided with said slot (11, 12), which can be inserted in a tailpiece (13) of said second half (4, 7) of the body (2, 5) and at least partly emerges from said tailpiece (13), each pin (15, 16) comprising a second end opposite to the first one which is provided with said limit element (17).

4. A joint as claimed in claim 2 or 3, wherein each pin (15, 16) can pivot within said hole.

5. A joint as claimed in anyone of the preceding claims, wherein each wedge-shaped body (9, 10) comprises a first portion (20, 21) having greater sizes than those of the corresponding hole (11, 12), in such a manner that said first portion (20, 21) cannot fully pass through said slot (11, 12); each wedge-shaped body (9, 10) further comprising a second portion (22, 23) substantially opposite to the first one (20, 21), on which a limit stop (24, 25) is active, which stop interferes with said slot (11, 12) in such a manner that said second portion (22, 23) cannot fully pass through said slot (11, 12).

6. A joint as claimed in claim 5, wherein said limit stop (24, 25) is a rivet inserted in a hole formed in the second portion (22, 23) of the wedge-shaped body (9, 10), submitted to plastic deformation in such a manner that it cannot be removed from said hole.

7. A joint as claimed in anyone of the preceding claims, wherein said clamping means (8) further comprises two connections (26, 27), each connection (26, 27) extending between the first (3, 6) and second (4, 7) halves of each body (2, 5) for mutually securing the first halves (3, 6) and the second halves (4, 7).

8. A joint as claimed in claim 7, wherein each connection (26, 27) is inserted in eyes (28, 29) of the first (3, 6) and second (4, 7) halves; said connection (26, 27) being slidable and rotatable within each eye (28, 29).

9. A joint as claimed in claim 8, wherein said connection (26, 27) comprises two limit stops (30, 31) placed on opposite ends of the connection (26, 27) for preventing the latter from slipping off the eyes (28, 29).

10. A scaffold **characterised in that** it comprises at least one joint (1) as claimed in anyone of the preceding claims.

FIG 1

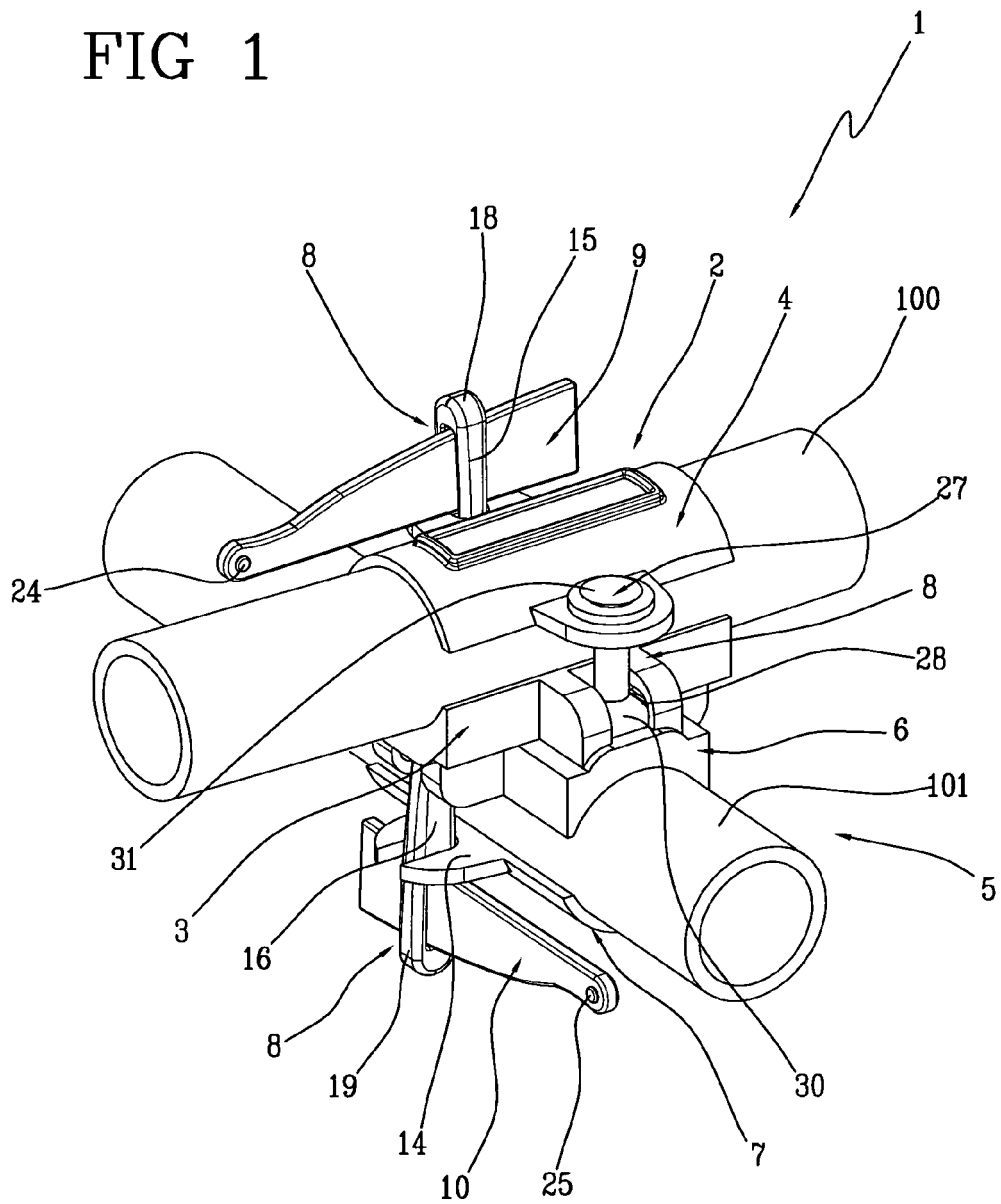


FIG 2

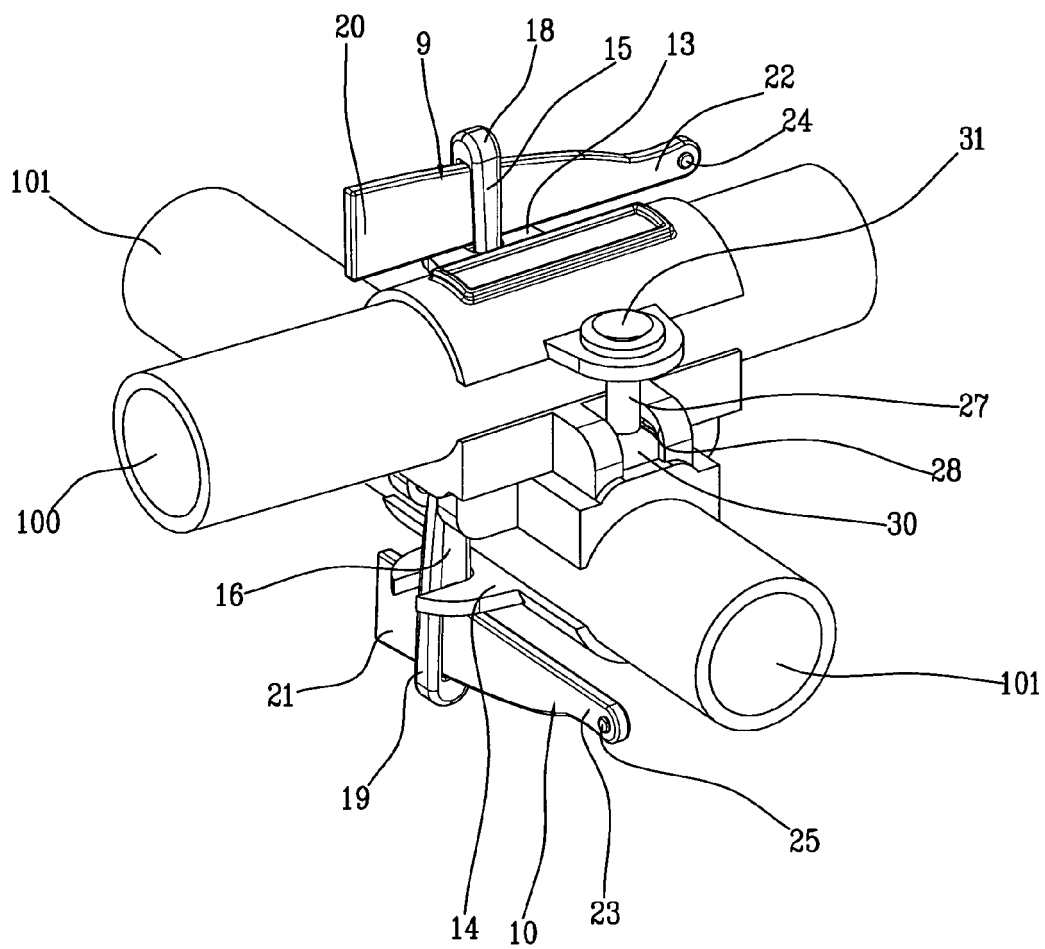


FIG 3

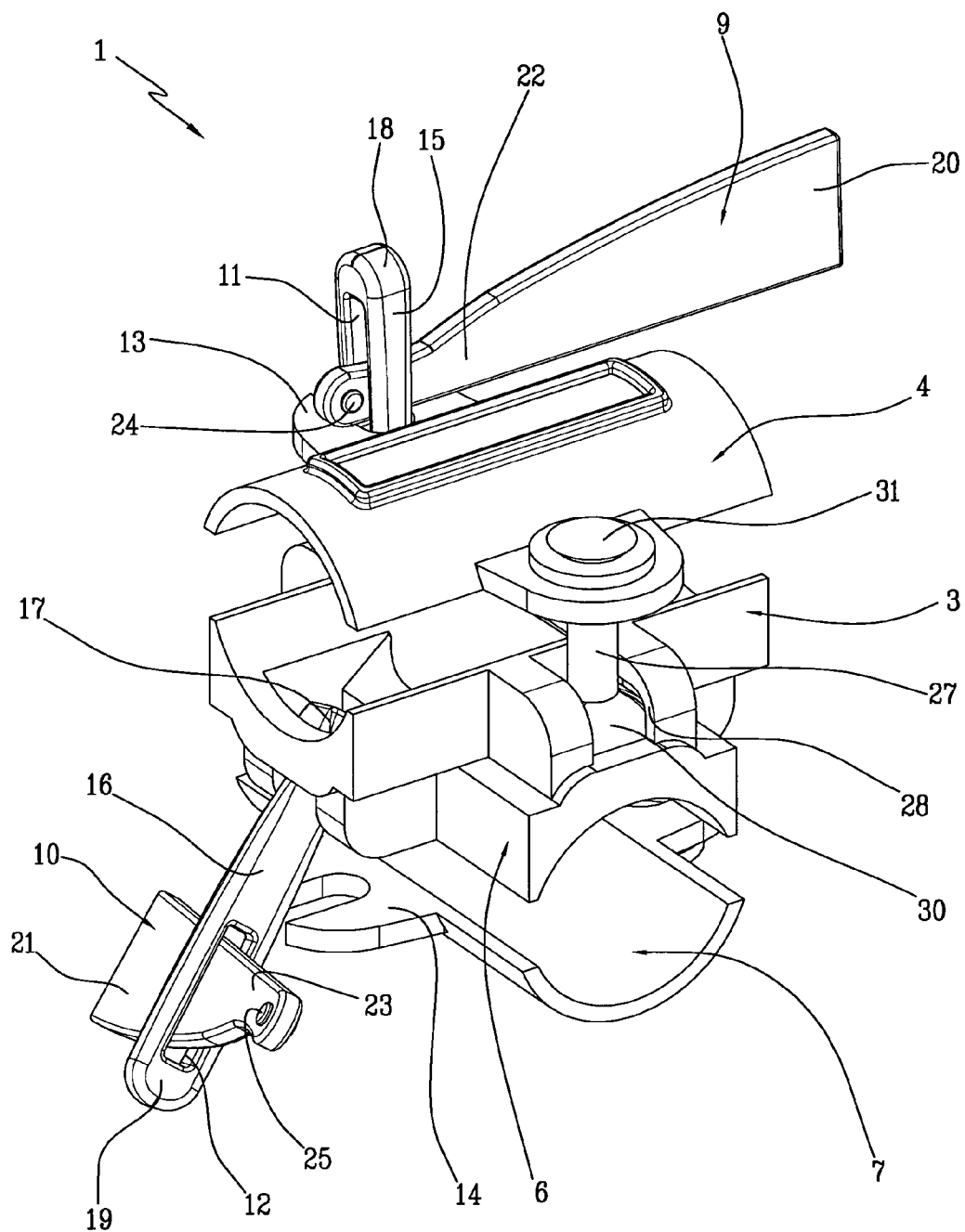
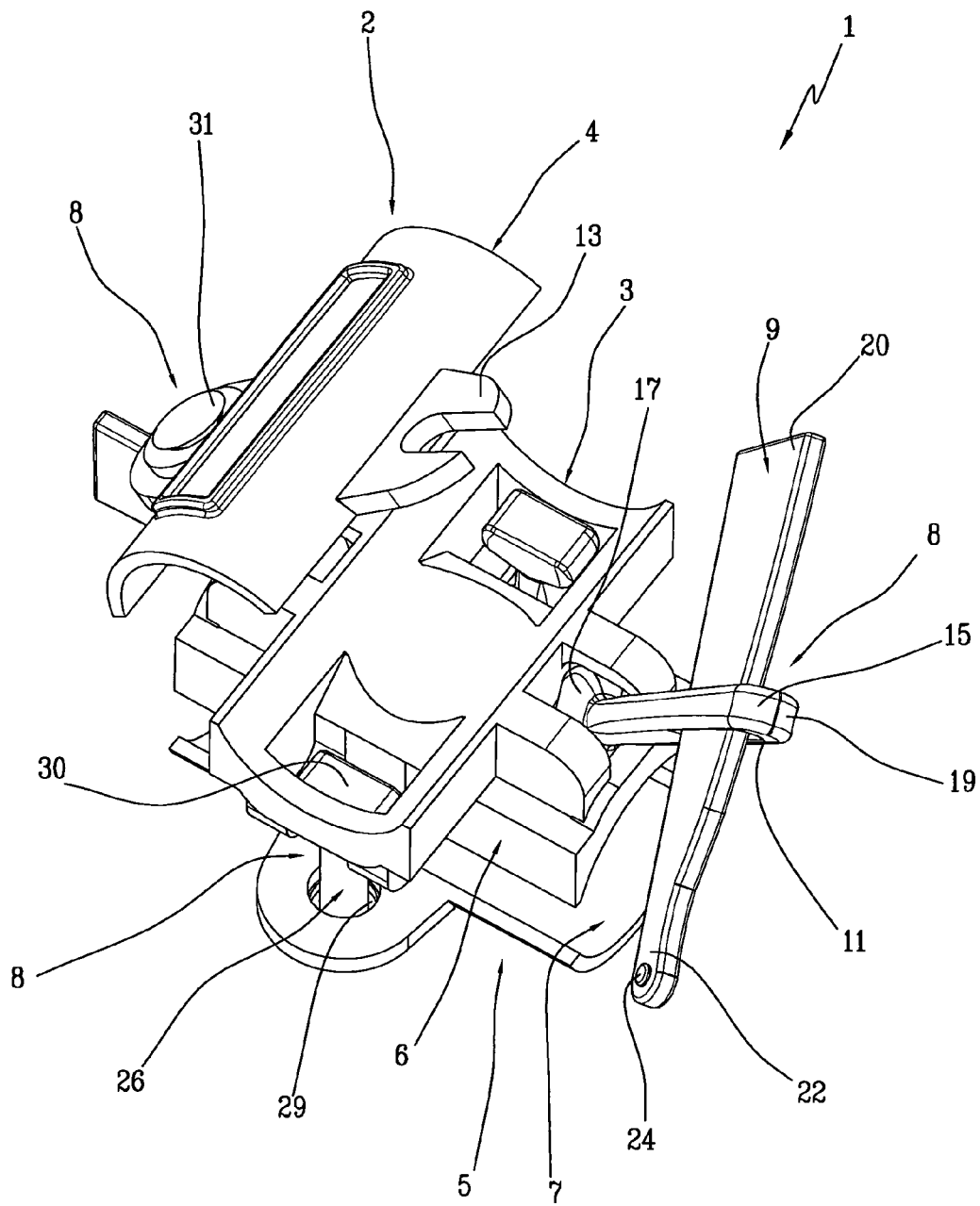


FIG 4





EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5081

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	CA 2 361 027 A1 (ETOBICOKE IRONWORKS LTD [CA]) 5 May 2003 (2003-05-05)	1-7,10	INV. E04G7/14
Y	* pages 3,4; figures 1,2 *	8,9	E04G7/16
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			TECHNICAL FIELDS SEARCHED (IPC)
			E04G
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 September 2011	Examiner Saretta, Guido
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 42 5081

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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08-09-2011

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CH 267893	A	30-04-1950	NONE