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

(11) EP 3 321 449 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.05.2018 Bulletin 2018/20

(21) Application number: **17275182.8**

(22) Date of filing: **10.11.2017**

(51) Int Cl.:
E04G 7/14 *(2006.01)* ***E04G 7/16*** *(2006.01)*
E04G 7/18 *(2006.01)* ***E04G 7/24*** *(2006.01)*

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **14.11.2016 GB 201619246**

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(54) SCAFFOLD CLAMPING APPARATUS AND METHOD OF USE THEREOF

(57) Scaffold clamping apparatus is provided including a first clamping element and at least a second clamping element. Each of said clamping elements has at least one clamping arm movable between a clamped position, whereon one or more items can be held in place between the clamping element in use, and an unclamped position, wherein one or more items can be located between and/or removed from the clamping element in use. The first and at least second clamping elements are arranged so as to allow relative pivotal and/or rotatable movement between the same. The first clamping element is offset from or non-aligned with the at least second clamping element.

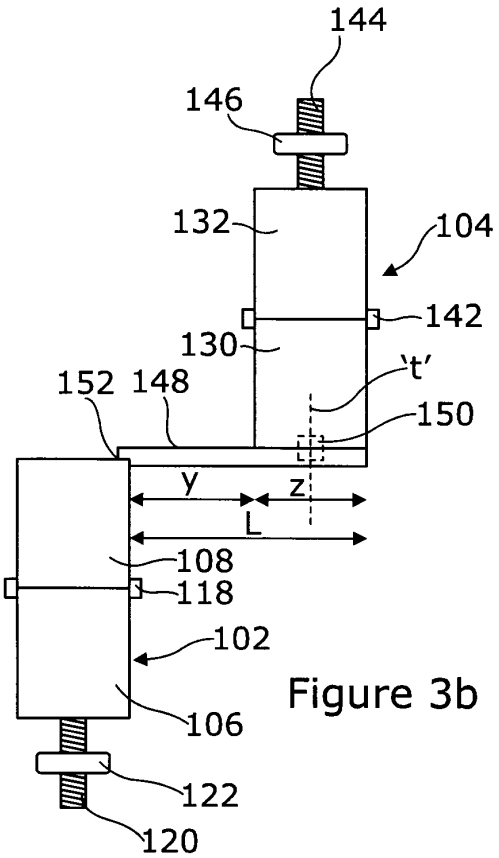

Figure 3b

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Description

[0001] This invention relates to scaffold clamping apparatus and to a method of use thereof.

[0002] Although the following description refers almost exclusively to scaffold clamping apparatus for clamping a transom scaffold tubes to a ledger scaffold tubes, it will be appreciated by persons skilled in the art that the present invention could be used to clamp any or any combination of scaffold components together.

[0003] Scaffolding is a temporary structure that is typically erected around a building or structure to safely support a person and/or materials during the construction of the building or structure. The basic components of scaffolding are tubes, couplers for connecting two or more tubes together, and boards. The key elements of a scaffold are "standards", "ledgers", "transoms" and "aberdeens". The standards are typically vertical tubes that transfer the weight of the structure to the ground. Ledgers are typically horizontal tubes which are connected between standards. Transoms are typically horizontal tubes that rest upon ledgers and are located at right angles to the same. Aberdeens are typically horizontal tubes that are fitted parallel to a transom, underneath the ledger and are attached to the standards.

[0004] It is known to provide double pivotable scaffold clamps or coupler fittings for allowing two different scaffold tubes to be fitted together in use. Each clamp element of the double scaffold clamp or coupler is typically used to secure a standard, ledger, transom or Aberdeen scaffold tube in use. One example of a double scaffold swivel coupler 2, is shown in figures 1a-2, and comprises first and second clamping elements 4, 6. Each clamping element 4, 6 has two clamping arms 8, 10 and 8', 10'. The clamping arms of each element are pivotably mounted to each other at one end 12, 12' thereof via a pivot pin 13, 13' , and are adjustably secured together at an opposite end 14, 14' by a threaded bolt 16, 16' with an adjustable nut 18, 18' rotatably mounted thereon. The threaded bolt 16, 16' can be pivotably mounted at the ends 14, 14' if required to allow the bolt to be moved into and out of engagement with at least one of the clamping arms in use. The clamping arms 8, 10; 8', 10' of each clamping element 4, 6 can be pivotably moved towards each other about pivot pin 13, 13' to form a clamped position, and away from each other to form an unclamped position. With the clamping arms 8, 10; 8' 10' in the required position in the clamped position, the threaded bolt and nut can be tightened via adjustment of the nut on the rotatable bolt to secure the scaffold tube in the clamping element. An aperture 20, 20' is defined between the two clamping arms 8, 10; 8', 10' in each clamping element 4, 6 for the location of a scaffold tube therethrough in use.

[0005] The first and second clamping elements 4, 6 are pivotably mounted to each other via a pivot means 22 provided between second clamping arm 10 of the first clamping element 4 and the first clamping arm 8' of the second clamping element 6. This allows the orientation of the clamping elements 4, 6, and thus the orientation of the tubes held by the clamping elements 4, 6 in use to be adjusted as required. It is to be noted that the pivot axis 'X' which allows the first clamping element 4 to pivot relative to the second clamping element 6 is coaxial for both the clamping elements 4, 6 and passes through at least one clamping arm 10, 8' of both the first and second clamping elements 4, 6. Thus, only a single pivot axis 'X' exists between the two clamping elements 4, 6 to allow pivoting of the clamping elements relative to each other in use.

[0006] A problem with this known double swivel coupler 2 is that the first and second clamping elements 4, 6 are generally or substantially aligned with each other in terms of a vertical arrangement (i.e. one clamping element is always located directly above the other clamping element). Thus, when the lower clamping element 6 is used to clamp a ledger 24 and the upper clamping element 4 is used to clamp a transom 26 in use, as shown in figure 2, at least the bolt 16 of the upper clamping element 4 obstructs the location of a walkway board on top of the transom 26 in use. In order to avoid this, the walkway boards are normally offset from the obstructing clamping element 4, which can leave a gap in the walkway between an edge of the board and the clamping element 4. The gap in the walkway is a safety issue in that a user could at least partially fall down the gap and/or a tool or materials could fall through the gap and land on a structure or person below, thereby causing damage or injury to the structure or person below.

[0007] It is therefore an aim of the present invention to provide scaffold clamping apparatus that overcomes the abovementioned problem.

[0008] It is a further aim of the present invention to provide a method of using scaffold clamping apparatus that overcomes the abovementioned problem.

[0009] According to a first aspect of the present invention there is provided scaffold clamping apparatus, said apparatus including a first clamping element and at least a second clamping element, each of said clamping elements having at least one clamping arm movable between a clamped position, wherein one or more items can be held in place between the clamping element in use, and an unclamped position, wherein one or more items can be located between and/or removed from the clamping element in use, the first and at least second clamping elements arranged so as to allow relative pivotal and/or rotatable movement between the same, characterised in that the first clamping element is offset from or non-aligned with the at least second clamping element.

[0010] Thus, the scaffold clamping apparatus of the present invention allows one of the clamping elements to be pivotably or rotatably moveable to a user required position relative to at least one other clamping element, while maintaining an offset position of the two clamping elements. The offset nature of the two clamping elements prevents one of the clamping elements from obstructing the other clamping element, prevents one or more items

locatable with the clamping elements from obstructing each other or the clamping elements and/or prevents one or more other items that may be positioned relative to the clamping elements from causing obstruction.

[0011] Preferably the one or more items are held in place between the at least one clamping arm in the clamped position, and are locatable between and/or removable from the at least one clamping arm in the unclamped position.

[0012] Preferably each clamping element includes at least two clamping arms, and the one or more items are held in place between the at least two clamping arm in the clamped position, and are locatable between and/or removable from between the at least two clamping arm in the unclamped position.

[0013] In one embodiment the first and at least second clamping elements are of the same type, shape, configuration, size and/or design. However, the first and at least second clamping elements could be a different type, shape, configuration, size and/or design if required.

[0014] Preferably each of the first and at least second clamping elements is an independent clamp. Thus, for example, a user could use one of the clamping elements without using the other clamping element(s), or a user could use both of the clamping elements independently of each other.

[0015] Preferably reference to relative pivotal and/or rotatable movement between the clamping elements is in relation to a whole or one clamping element being pivotably or rotatably movable to a whole of the other clamping element(s).

[0016] Preferably the first clamping element and/or the clamping arm(s) of the first clamping element are offset or non-aligned from the at least second clamping element and/or the clamping arm(s) of the second clamping element along an axis, in a horizontal and/or vertical direction or axis.

[0017] Preferably the first and second clamping elements are not arranged one on top of the other, are not stacked and/or are not vertically or horizontally aligned as they are in the prior art arrangement.

[0018] In one embodiment the first and at least second clamping elements are arranged to allow relative pivotal and/or rotatable movement between the same around a single pivotal axis only, at least one pivotal axis, two pivotal axes only or two or more pivotal axes.

[0019] Preferably the first and/or second clamping elements are arranged to allow relative pivotal and/or rotatable movement through 0-360 degrees around said pivot axis or each of the said pivot axes.

[0020] In a preferred embodiment the first and/or at least second clamping elements are arranged to allow relative pivotal and/or rotatable movement through 360 degrees around said pivot axis or axes.

[0021] In one embodiment where only a single pivotal axis is provided, preferably said pivotal axis allowing relative pivotal and/or rotatable movement between the first and second clamping elements only passes through one of the clamping elements, one of the clamping arms of the clamping element and/or through a clamping aperture defined between or by the clamping arm of a clamping element. Preferably the single pivot axis does not pass through the first and at least second clamping elements.

[0022] Preferably the clamping aperture is the aperture defined between the clamping arms or by the at least one clamping arm of a clamping element, through which one or more items for clamping by the clamping element are located in use.

[0023] In one embodiment where two axes only are provided, or two or more pivotal axes are provided, preferably a first pivotal axis passes through the first clamping element and at least a second pivotal axis passes through the at least second clamping element; a first pivotal axis passes through one of the clamping arms of the first clamping element and at least a second pivotal axis passes through one of the clamping arms of the at least second clamping element; and/or a first pivotal axis passes through a clamping aperture defined between the clamping arm(s) of the first clamping element and at least a second pivotal axis passes through a clamping aperture defined between the clamping arm(s) of the at least second clamping element. Preferably the two pivotal axes are offset from each other and/or are non-aligned.

[0024] Preferably the two or more pivotal axes are parallel or substantially parallel to each other but are a spaced distance apart and offset or non-coaxial from each other.

[0025] Preferably the pivot axis, or one of the pivot axes, passes directly through the clamping arm or at least one of the clamping arms of one of the first or second clamping elements but is offset or a spaced distance apart from the clamping arm or at least one of the clamping arms of the other of the first or second clamping elements.

[0026] Thus, in one example, the pivot axis, or one of the pivot axes, does not pass directly through the clamping arm(s) of one of the clamping elements.

[0027] Preferably the pivot axis, or one of the pivot axes, about which the first and second clamping elements pivot and/or rotate relative to each other in use is offset from one of the clamping elements.

[0028] In one embodiment the at least one clamping arm, and preferably at least two clamping arms, of each clamping element define an aperture or main aperture therebetween in which the one or more items, scaffold tubes and/or the like are located and/or sit when in the clamped or unclamped positions in use.

[0029] Preferably a plane of the main or clamping aperture passing between the at least one clamping arm, and preferably two clamping arms, of the first clamping element is offset or a spaced distance apart from a plane of the main or clamping aperture passing between the at least one clamping arm, and preferably two clamping arms, of the at least second clamping element.

[0030] In one embodiment the planes of the main or clamping apertures of each of the first and at least second

clamping elements are parallel or substantially parallel to each other.

[0031] In one embodiment the at least one clamping arm, or each of the at least two clamping arms, of each clamping element, includes a body portion having first and second ends. Preferably the part of the body portion between the first and second ends of the clamping arm defines, at least in part, the main or clamping aperture through which the one or more items for clamping are located in use.

[0032] Preferably, where two clamping arms are provided, each clamping arm is semicircular in shape.

[0033] In one embodiment a clamping arm of a clamping element is pivotably or hingedly mounted to at least one other clamping arm of the same clamping element to allow the clamping arms to be moved between the clamped and unclamped positions about a pivot or hinge axis in use.

[0034] Preferably the pivot or hinge axis or axes between the two or more clamping arms of a clamping element are independent of and distinct to the at least one pivotal axis that allows relative pivotal and/or rotatable movement between the first and at least second clamping elements.

[0035] In one embodiment one clamping arm is pivotably or hingedly mounted to another clamping arm at each of the first ends thereof.

[0036] Preferably the first end of one of the clamping arms is adjacent to, directly opposite to and/or in abutting relationship with the first end of another clamping arm of the same clamping element in use.

[0037] In one embodiment securing means or a securing mechanism is provided on or associated with one or more of the clamping arms and/or each clamping element to allow the same to be secured in the clamped position in use.

[0038] In one embodiment the securing means are provided on or associated with the second ends of two clamping arms (i.e. the ends opposite to the ends pivotably or hingedly mounted to another clamping arm).

[0039] Preferably the second end of one of the clamping arms is adjacent to, directly opposite to and/or can be brought into abutting relationship with the second end of another clamping arm of the same clamping element in use.

[0040] Preferably the securing means can include any or any combination of one or more nuts and bolts, screws, inter-engaging members, clips, pivotable members, trunnions and/or the like.

[0041] Preferably the securing means allow adjustment in position, distance and/or location of the ends of the clamping arm, or the second end of one of the clamping arms relative to the second end of the other clamping arms, with which the securing means are provided on or associated with in use. For example, the securing means allows the second ends of the clamping arms to be moved relatively towards each other to form a clamped position, and relatively away from each other to form an unclamped position.

[0042] Preferably with the securing means provided on or associated with one of the first or second ends of a clamping arm of a clamping element, the other of the first or second ends is pivotably mounted to another clamping arm of said clamping element.

[0043] In one embodiment a spacing means or a spacing element is provided between the first and at least second clamping elements to provide the offset or non-aligned arrangement.

[0044] In one embodiment the spacing means or spacing element is joined to or integrally formed with one of the first and at least second clamping elements and is pivotably or rotatably mounted to the other of the first and at least second clamping elements.

[0045] In one embodiment the spacing means or spacing element is independently pivotably or rotatably mounted to each of the first and at least second clamping elements. Thus, in one example, the spacing means or spacing element is pivotably mounted to the first clamping element for pivotal movement about a first pivotal axis in use. The spacing means or spacing element is pivotably mounted to the second clamping element for pivotal movement about a second pivotal axis in use. Preferably the first and second pivotal axes are separate and a spaced distance apart from each other.

[0046] Preferably the spacing means or spacing element is pivotably mounted to a first clamping element at or adjacent a first end of said spacing means or element, and is pivotably mounted to a second clamping element at or adjacent a second end of said spacing means or element.

[0047] Preferably the first end of the spacing means or spacing element is opposite or substantially opposite to the second end of the spacing means or spacing element.

[0048] In one embodiment the spacing means or spacing element is a plate or plate like member.

[0049] Preferably the spacing means or spacing element is a rigid or substantially rigid member.

[0050] In one embodiment the spacing means or element is arranged to maintain the coupling elements a fixed distance apart from each other in use.

[0051] In one embodiment the spacing means or element is arranged to be adjustable in length to allow adjustment of the distance between the coupling elements in use.

[0052] In one embodiment the spacing means or spacing element protrudes outwardly from a side, outer surface and/or edge of the clamping arm, or one of the clamping arms of the first and/or second clamping elements.

[0053] In one embodiment the spacing means or spacing element is fixed to and protrudes outwardly from an outer surface, a side and/or an edge of the, or one of the, clamping arms of the first clamping element, and is rotatably or pivotably mounted to an outer surface of the at least second clamping element or vice versa.

[0054] In one embodiment the spacing means or spac-

ing element is fixed to an outer surface of the first clamping element, and is rotatably mounted to an outer surface of the at least second clamping element, or vice versa.

[0055] Preferably each clamping arm has a width and the spacing means or element is fixed to, pivotably and/or rotatably mounted in a central or substantially central position of said clamping arm width.

[0056] Preferably the pivotal axis of one or each of the clamping elements is arranged through a central or substantially central location of said clamping arm width.

[0057] In one embodiment the spacing means or spacing element is rotatably or pivotably mounted to a top surface and/or outer surface of the at least second clamping element, and is rotatably or pivotably mounted to a base surfaceand/or outer surface of the at least first clamping element or vice versa.

[0058] In one embodiment the first and at least second clamping elements are mounted, joined or formed so as to protrude outwardly from a first or same surface of the spacing means or spacing element (i.e. the same surface of the spacing means or spacing element).

[0059] In one embodiment the first and at least second clamping elements are mounted, joined or formed so as to protrude outwardly from opposite and/or different surfaces of the spacing means or spacing element.

[0060] Preferably the main plane and/or longitudinal axis of the spacing means or spacing element is perpendicular to or substantially perpendicular to the pivotal axis, or pivotal axes, that allows relative pivotal and/or rotatable motion between the first and at least second clamping elements.

[0061] Preferably the plane of the main or clamping aperture defined between the at least one clamping arm of a clamping element is perpendicular or substantially perpendicular to a main plane and/or longitudinal axis of the spacing means or spacing element.

[0062] Preferably the plane of the main aperture defined between the at least one clamping arm of a clamping element is parallel or substantially parallel to the pivotal axis, or pivotal axes, allowing relative pivotal movement between the first and second clamping elements.

[0063] In one embodiment each clamping element includes first and second clamping arms. Preferably the first and second clamping arms are arranged opposite or substantially opposite to each other.

[0064] Preferably the first and second clamping arms are movable towards each other to form a clamped position, wherein one or more items or scaffold tubes can be held in place between the same, and away from each other to form an unclamped position, wherein one or more items or scaffold tubes can be located in and/or removed from between the clamping arms of the clamping elements.

[0065] Preferably the scaffolding apparatus is in the form of a scaffold swivel coupler or a double scaffold swivel coupler.

[0066] Preferably the one or more items to be located through the apertures of the apparatus and to be clamped therein in use include one or more scaffold tubes, such as for example, one or more transoms, ledgers, Aberdeens, standards and/or the like.

[0067] According to a second aspect of the present invention there is provided a method of using scaffold clamping apparatus, said apparatus including a first clamping element and at least a second clamping element, each of said first and at least second clamping elements including at least one clamping arm, and said method including the steps of moving at least one of said clamping elements between a clamped position, whereon one or more items can be held in place by the same in use, and an unclamped position, wherein one or more items can be located between and/or removed from the clamping element in use, pivoting and/or rotating the first and/or at least second clamping elements relative to each other to achieve a user required position, characterised in that the first clamping element is offset from or non-aligned with the at least second clamping element.

[0068] Embodiments of the present invention will now be described with reference to the following figures, wherein:

Figures 1a and 1b (PRIOR ART) show a perspective view and an end view of a prior art double swivel scaffolding coupler respectively;

Figure 2 (PRIOR ART) is a perspective view of a double swivel scaffolding coupler in the prior art coupling a ledger scaffold tube to a transom scaffold tube in use;

Figures 3a and 3b show a perspective view and an end view of scaffold apparatus respectively according to an embodiment of the present invention;

Figure 4 is a perspective view of the scaffold apparatus shown in figures 3a and 3b coupling a ledger scaffold tube to a transom scaffold tube in use; and

Figures 5a and 5b show a perspective view and an end view of scaffold apparatus respectively according to a further embodiment of the present invention.

[0069] Referring firstly to figures 3a and 3b, there is illustrated scaffolding apparatus in the form of a swivel double scaffold coupler 100 according to an embodiment of the present invention. The coupler 100 comprises a first clamping element 102 and a second clamping element 104 that are pivotably mounted so as to allow relative pivotal movement between the clamping elements 102, 104.

[0070] The first clamping element 102 comprises a first clamping arm 106 and a second clamping arm 108. First clamping arm 106 has a first end 110 and a second end 112. Second clamping arm 108 has a first end 114 and a second end 116. The first ends 110, 114 of the clamping arms 106, 108 are pivotally mounted to each other via

pivot pin 118. The second ends 112, 116 of the clamping arms 106, 108 have securing means in the form of a threaded bolt 120 and an adjustment nut 122 arrangement to allow the ends 112, 116 to be moved towards each other and away from each other and to allow the clamping arms 106, 108 to be moved between clamped and unclamped positions respectively in use.

[0071] Thus, clamping arms 106, 108 are pivotally movable between a clamped position, as shown in figure 3a, wherein one or more items in the form of scaffold tubes can be clamped in position between the clamping arms 106, 108 in use, to an unclamped position, wherein the one or more items or scaffold tubes can be located between and/or removed from the clamping arms 106, 108 in use.

[0072] The second clamping element 104 has similar features of the first clamping element 102, in that it comprises first clamping arm 130 and a second clamping arm 132. First clamping arm 130 has a first end 134 and a second end 136. Second clamping arm 132 has a first end 138 and a second end 140. The first ends 134, 138 of the clamping arms 130, 132 are pivotally mounted to each other via pivot pin 142. The second ends 136, 140 of the clamping arms 130, 132 have securing means in the form of a threaded bolt 144 and nut 146 arrangement to allow the ends 136, 140 to be moved relatively towards each other and relatively away from each other and to allow the clamping arms 130, 132 to be moved between clamped and unclamped positions in a similar manner to clamping arms 106, 108 of the first clamping element 102.

[0073] Thus, clamping arms 130, 132 are pivotally movable between a clamped position, as shown in figure 3a, wherein one or more items in the form of scaffold tubes can be clamped in position between the clamping arms 130, 132 in use, to an unclamped position, wherein the one or more items or scaffold tubes can be located between and/or removed from the clamping arms 130, 132 in use.

[0074] In the clamped position, the ends 136, 140 are moved relatively towards each other. In the unclamped position, the ends 136, 140 are moved relatively away from each other.

[0075] In accordance with the present invention, a spacing element 148 is provided. Spacing element 148 is pivotably mounted directly to first clamping arm 130 of second clamping element 104 via a pivot pin 150. The spacing element 148 is joined to or integral with second clamping arm 108 of the first clamping element 102. In this particular example, the spacing element 148 is joined to a peripheral edge 152 of second clamping arm 108, but it could be joined to or integral with any surface of the second clamping arm as required.

[0076] Thus, first clamping arm 130 of the second clamping element 104 is a spaced distance apart from the second clamping arm 108 of the first clamping element. The spacing element has a length '1' and the distance of separation 'y' between the nearest edges of the first and second clamping elements is equal to or substantially equal to the distance '1' minus the width 'z' of the clamping arm 130. As such, the clamping elements of the present invention cannot be moved into a stacked arrangement with one clamping element directly on top of the other clamping element and the clamping elements cannot be moved into both horizontal and vertical alignment as they can with the prior art arrangement. Thus, in accordance with the present invention, the clamping elements are non-aligned and are offset from each other by a distance equal to or substantially equal to the distance 'y'. The distance 'y' can be determined by the manufacturer as required. However, in at least one example, the distance 'y' is such so as to provide clearance of the clamping element from a walkway board that may be placed on a scaffold tube on which the scaffold apparatus is being used.

[0077] The aperture 154 defined between the clamping arms 106, 108 of clamping element102 and the aperture 156 defined between the clamping arms 130, 132 of clamping element 104 each have a main plane, defined as 'p' and 'p" in figure 3a. The aperture plane 'p' of the first clamping element 102, is offset or out of alignment from the aperture plane 'p" of the second clamping element 104. The pivotal axis 't' allowing pivotal movement between the clamping elements 102, 104 only passes through one of the clamping elements 104 and does not pass through the first clamping element 102 or the clamping arms 106, 108 of the first clamping element 102.

[0078] Figure 4 illustrates the coupler 100 of the first present invention fitted to scaffold tubing in one example. The second clamping element 104 is clamped to a ledger 24 and the first clamping element 102 is clamped to a transom 26. As a result of the spacing element 148 provided between the first and second clamping elements, the first clamping element 104 is offset from the longitudinal axis of the ledger, thereby allowing a walkway board to be placed on the transom directly over the ledger. This arrangement is not possible to do with the prior art. The advantage of the present invention is that no gaps are left when laying walkway boards.

[0079] Although the above description only refers to clamping apparatus for clamping ledger scaffold tubes to transom scaffold tubes, it will be appreciated that the clamping apparatus of the present invention could be used to clamp any scaffold tubes together. For example, it could be used in bracing connections where scaffold poles are arranged in diagonal arrangement in a scaffold structure. It could be used in splicing connections that joins two parallel tubes together and/or the like.

[0080] Although the clamping arms are shaped so as to clamp tubular or substantially tubular shaped objects, it will be appreciated that the clamping arms can be shaped so as to clamp any item with any cross sectional shape as required.

[0081] Referring figures 5a-5b, there is illustrated a further embodiment of the present invention in which the first and second clamping elements 102, 104 are each independently arranged to pivot about a pivot axis 't' and

's'. Thus, this embodiment has two separate and spaced apart pivot axes 't', 's', in contrast to the embodiment shown in figures 3-3b, wherein only a single pivot axis 't' is provided.

[0082] The same reference numerals have been used to describe the same feature in this embodiment as in the earlier described embodiment.

[0083] In this embodiment, the spacing element 148 is mounted to clamping arm 108 of the first clamping element 102 via a pivot pin 158 at a first end 160 of the spacing element. The spacing element 148 is mounted to clamping arm 130 of the second clamping element 104 via pivot pin 150 at a second end 162 of the spacing element.

[0084] Clamping element 102 is independently pivotable relative to the spacing element 148 and to clamping element 104. Clamping element 104 is independently pivotable relative to the spacing element 148 and the clamping element 102.

[0085] In this embodiment the length of the spacing element extends between ends 160, 162.

Claims

1. Scaffold clamping apparatus, said apparatus including a first clamping element and at least a second clamping element, each of said clamping elements has at least one clamping arm movable between a clamped position, whereon one or more items can be held in place between the clamping element in use, and an unclamped position, wherein one or more items can be located between and/or removed from the clamping element in use, the first and at least second clamping elements arranged so as to allow relative pivotal and/or rotatable movement between the same, **characterised in that** the first clamping element is offset from or non-aligned with the at least second clamping element.

2. Apparatus according to claim 1 wherein the first and at least second clamping elements are arranged to allow relative pivotal and/or rotatable movement around a single pivotal axis only, at least one pivotal axis, two pivotal axes only, or two or more pivotal axes.

3. Apparatus according to claims 1 or 2 wherein when the first and at least second clamping elements are arranged to allow relative pivotal and/or rotatable movement around a single pivotal axis only, the pivotal axis passes through only one of the clamping elements, through one of the clamping arms of one of the clamping elements and/or through a clamping aperture defined between the clamping arms of one of the clamping elements.

4. Apparatus according to claims 1 or 2 wherein when the first and at least second clamping elements are arranged to allow relative pivotal and/or rotatable movement around two pivotal axes only or around more than two axes, a first pivotal axis passes through the first clamping element and at least a second pivotal axis passes through the at least second clamping element; a first pivotal axis passes through one of the clamping arms of the first clamping element and at least a second pivotal axis passes through one of the clamping arms of the at least second clamping element; and/or a first pivotal axis passes through a clamping aperture defined between the clamping arm(s) of the first clamping element and at least a second pivotal axis passes through a clamping aperture defined between the clamping arm(s) of the at least second clamping element.

5. Apparatus according to claim 1 wherein the at least one clamping arm of each clamping element defines a clamping or main aperture therebetween in the clamped or unclamped positions, and wherein a plane of the clamping or main aperture passing between the at least one clamping arm of the first clamping element is offset and a spaced distance apart from a plane of the clamping or main aperture passing between the at least one clamping arm of the at least second clamping element.

6. Apparatus according to claim 5 wherein the planes of the clamping or main apertures of each of the first and at least second clamping elements are parallel or substantially parallel to each other.

7. Apparatus according to claim 1 wherein at least one of the clamping elements includes two or more clamping arms, and at least one of said two or more clamping arms of said clamping element is pivotably or hingedly mounted to at least one other clamping arm of said clamping element to allow the clamping arms to be moved between the clamped and unclamped positions in use.

8. Apparatus according to claim 7 wherein a pivot or hinge axis or axes between the two or more clamping arms of a clamping element are separate to, independent of and distinct to the at least one pivotal axis that allows relative pivotal and/or rotatable movement between the first and at least second clamping elements in use.

9. Apparatus according to claim 1 wherein securing means are provided on or associated with the at least one clamping arm and/or each clamping element to allow the same to be secured in the clamped position in use.

10. Apparatus according to claim 1 wherein a spacing

means or a spacing element is provided between the first and at least second clamping elements to provide the offset or non-aligned arrangement.

11. Apparatus according to claim 10 wherein the spacing means or spacing element is joined to or integrally formed with one of the first and at least second clamping elements and pivotably or rotatably mounted to the other of the first and at least second clamping elements.

12. Apparatus according to claim 10 wherein the spacing means or spacing element is independently pivotably or rotatably mounted to each of the first and at least second clamping elements.

13. Apparatus according to any or claims 10-12 wherein the spacing means or spacing element protrudes outwardly from an outer surface, side and/or edge of the first and/or second clamping elements.

14. Apparatus according to any preceding claim wherein a main plane or longitudinal axis of the spacing means or spacing element is perpendicular or substantially perpendicular to the pivotal axis or axes that allow relative pivotal and/or rotatably movement between the first and at least second clamping elements and/or to a plane of the main or clamping aperture defined between the at least one clamping arm of a clamping element.

15. A method of using scaffold clamping apparatus, said apparatus including a first clamping element and at least a second clamping element, each of said first and at least second clamping elements including at least one clamping arm, and said method including the steps of moving at least one of said clamping elements between a clamped position, whereon one or more items can be held in place by the same in use, and an unclamped position, wherein one or more items can be located between and/or removed from the clamping element in use, pivoting and/or rotating the first and/or at least second clamping elements relative to each other to achieve a user required position, **characterised in that** the first clamping element is offset from or non-aligned with the at least second clamping element.

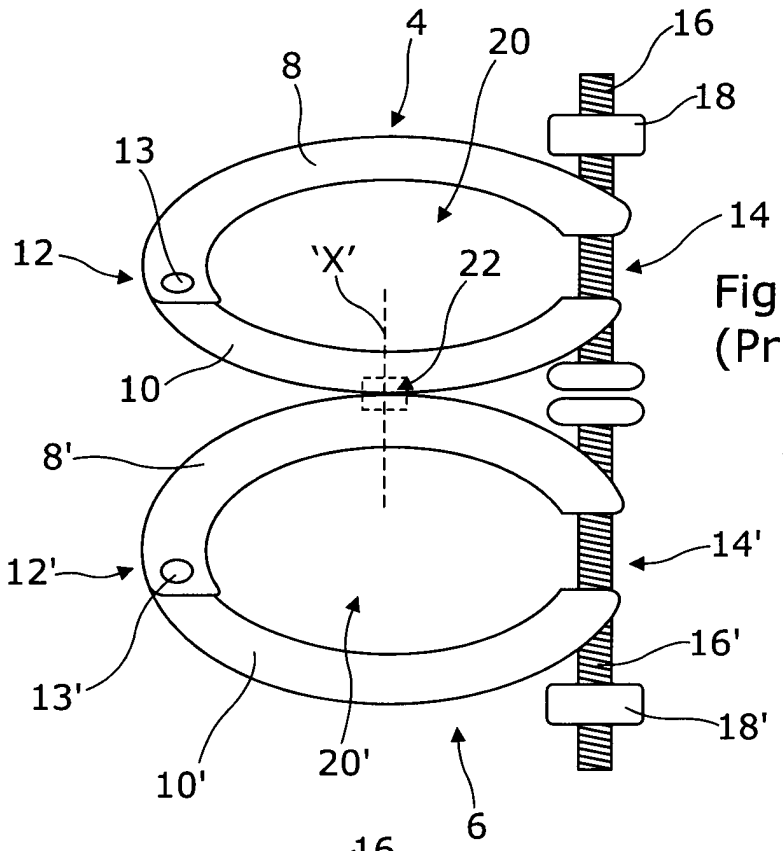

Figure 1a
(Prior Art)

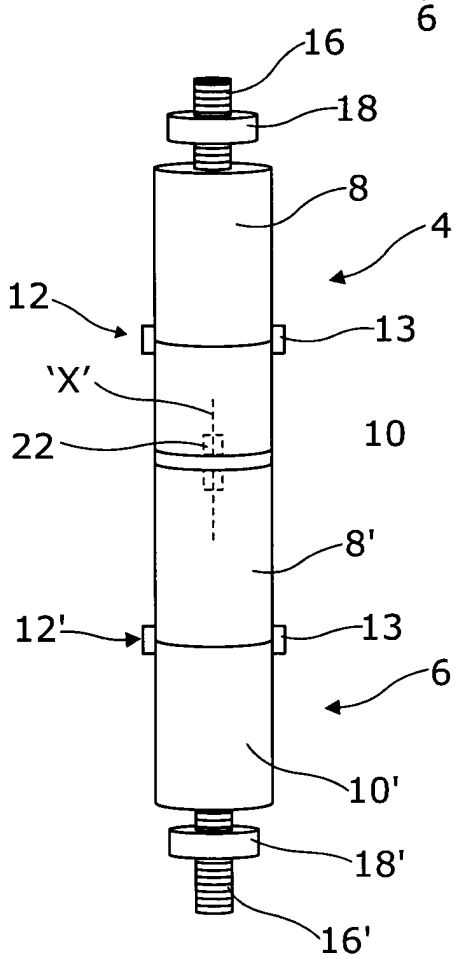

Figure 1b
(Prior Art)

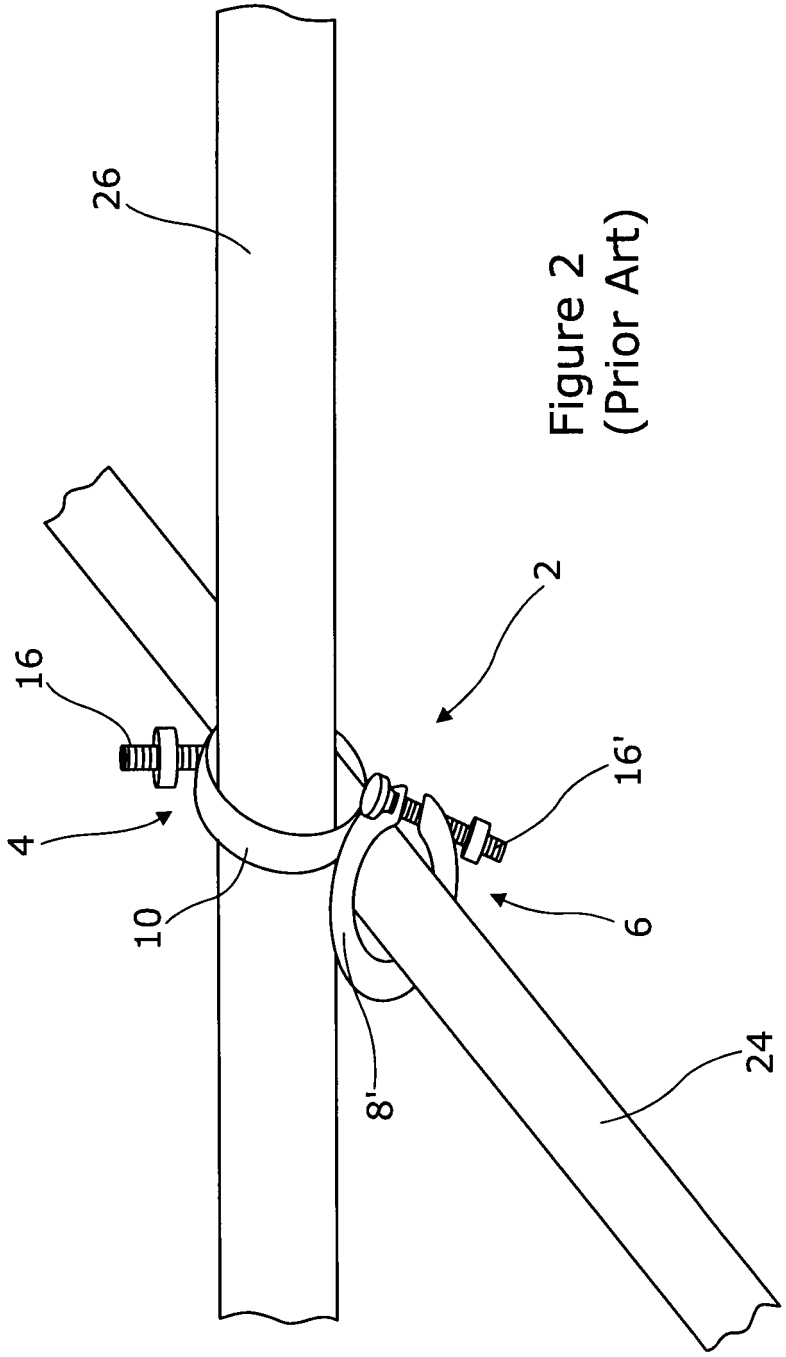

Figure 2
(Prior Art)

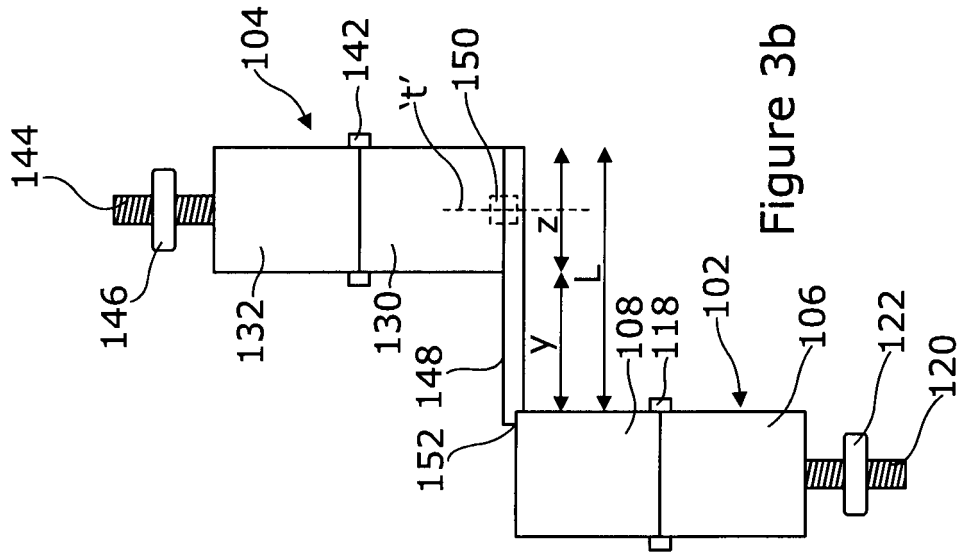

Figure 3b

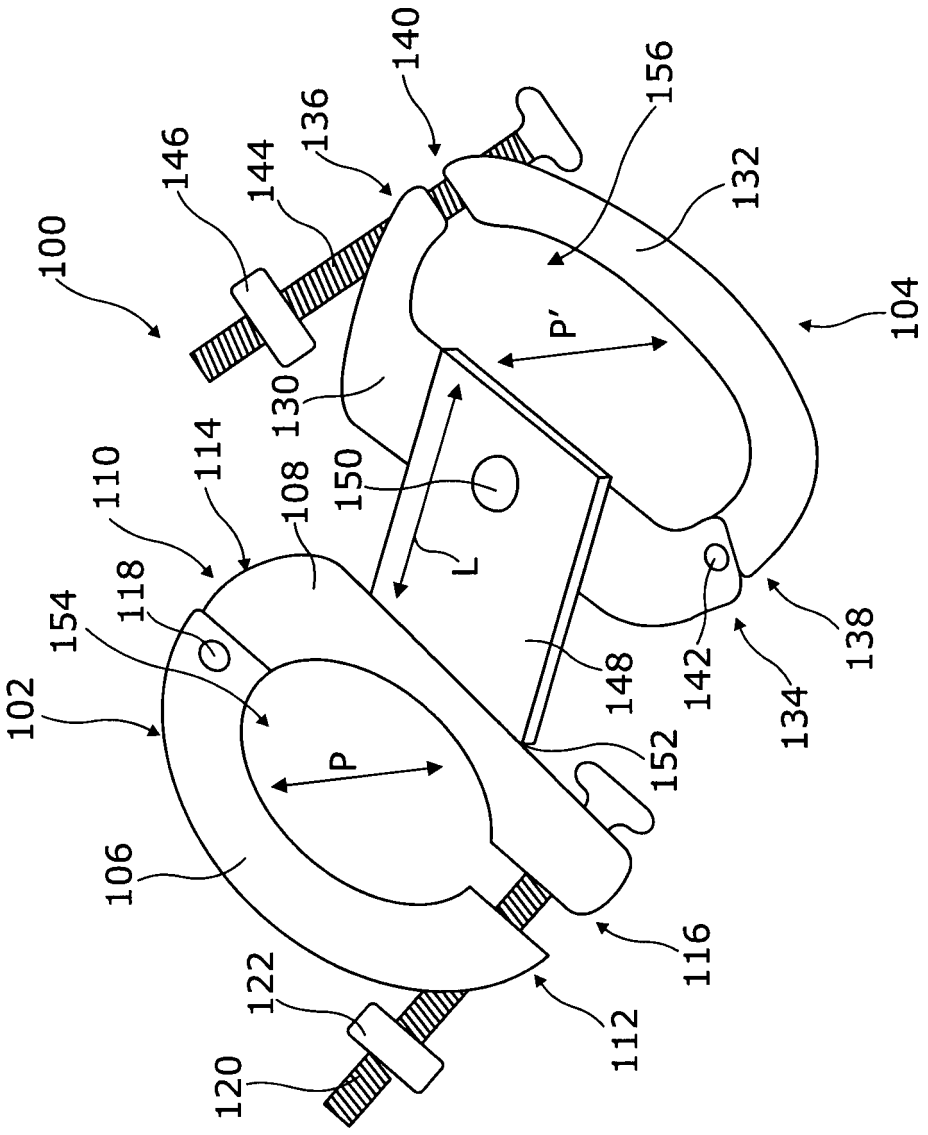

Figure 3a

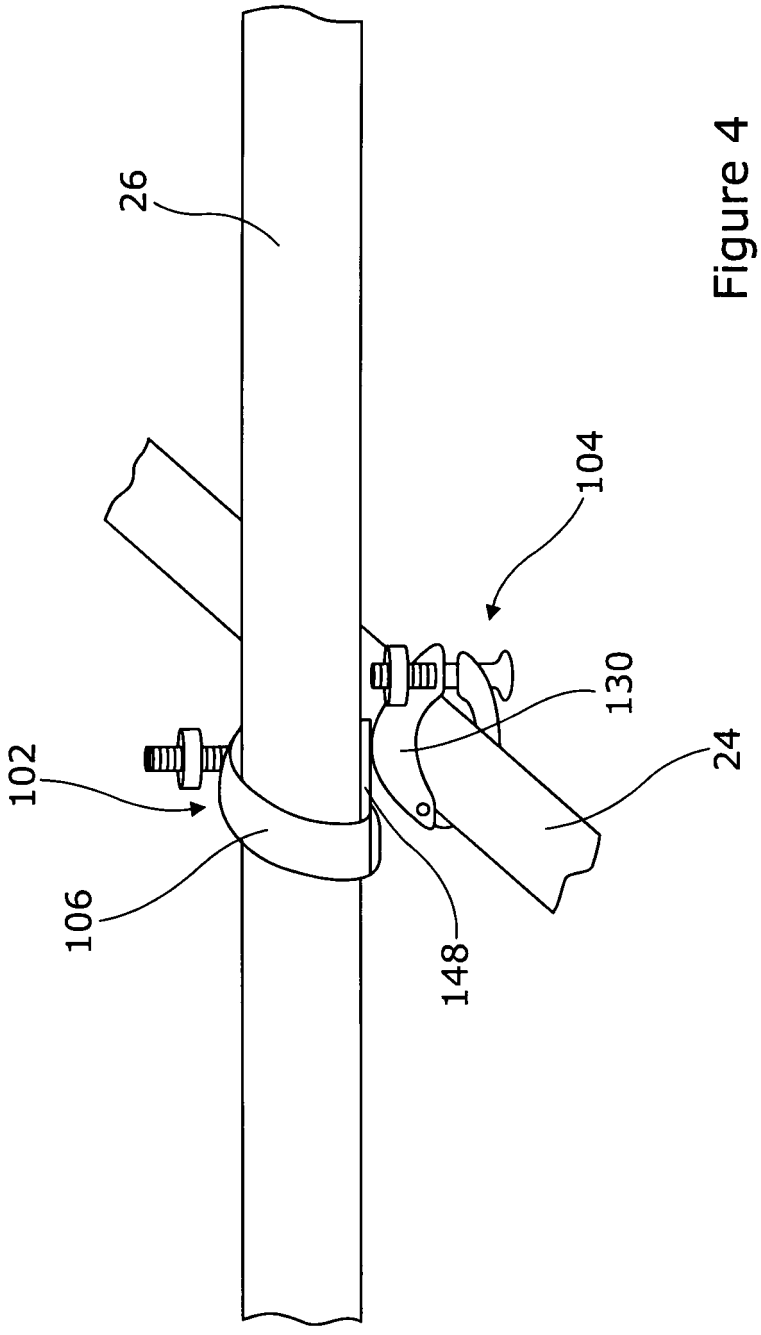

Figure 4

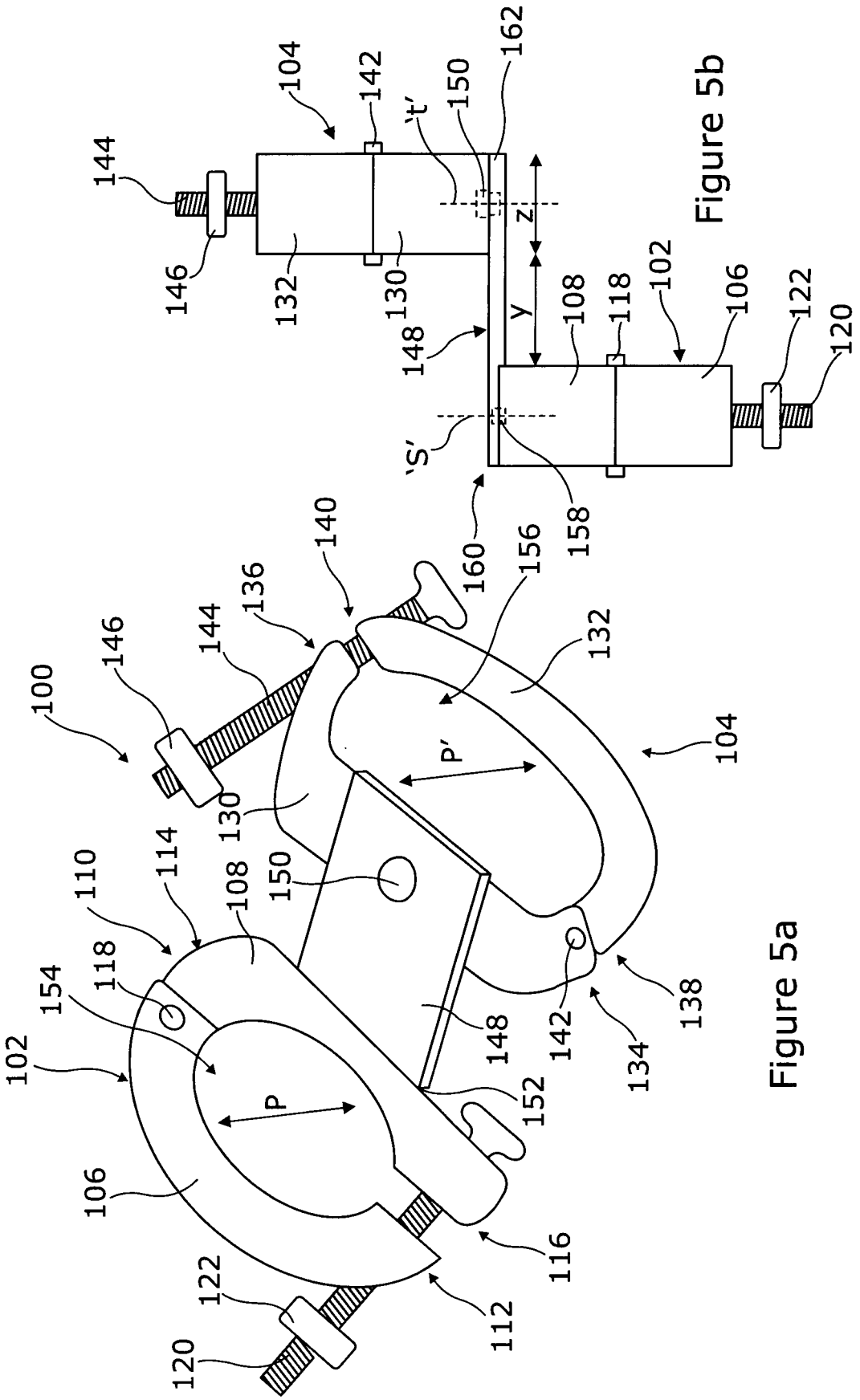

Figure 5a

Figure 5b

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EUROPEAN SEARCH REPORT

Application Number
EP 17 27 5182

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	GB 2 320 050 A (CAMPBELL EDWARD JOSEPH RUSSELL [GB]) 10 June 1998 (1998-06-10) * the whole document *	1-15	INV. E04G7/14 E04G7/16 E04G7/18 E04G7/24
X	FR 2 337 238 A1 (MEYNIEU FRANCIS [FR]) 29 July 1977 (1977-07-29) * pages 2-4; figure 5 *	1-15	
X	EP 2 966 241 A1 (EDILIMPIANTI DI DEPLANO VITTORIO [IT]) 13 January 2016 (2016-01-13) * pages 1,2; figures 3,4,1,2 *	1-15	
X	US 1 803 508 A (ROSSMAN ALLEN M) 5 May 1931 (1931-05-05) * pages 2-4; figures 11-13 *	1-15	
X	GB 1 249 821 A (BURTON DELINGPOLE & COMPANY LT) 13 October 1971 (1971-10-13) * pages 1,2; figure 1 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC) E04G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 February 2018	Garmendia Irizar, A

CATEGORY OF CITED DOCUMENTS

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21-02-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2320050 A	10-06-1998	NONE	
FR 2337238 A1	29-07-1977	NONE	
EP 2966241 A1	13-01-2016	NONE	
US 1803508 A	05-05-1931	NONE	
GB 1249821 A	13-10-1971	NONE	

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