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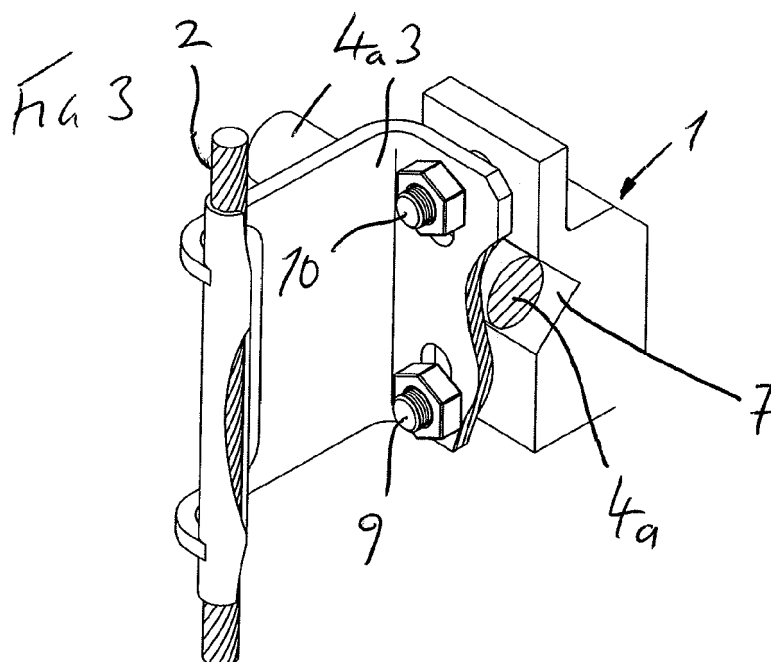
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(54) **Mounting device for a safety line**

(57) A mounting device for a safety line anchor has a first mounting aspect and a second mounting aspect, each mounting aspect enabling mounting to a differently shaped structure. One of the mounting aspects comprises a recess formation and the other of the mounting aspects comprises a shoulder formation. The recess for-

mation and the shoulder formation are positioned on opposed sides of the device. The recess formation is capable of receiving a circular and/or square section ladder rung and the shoulder formation is provided with substantially perpendicular reaction surfaces against which an L shaped ladder rung can be anchored.



Description

[0001] The present invention relates to a mounting device for a safety line. Particularly the device is intended for use with a safety line anchoring arrangement suitable for anchoring the upper or lower end of a flexible elongate safety line, for example disposed in a substantially vertical orientation on a tall structure.

[0002] Tall structures such as electricity pylons and radio or satellite communication masts are periodically inspected to determine whether any maintenance work is required. These structures are purpose built to be low maintenance and, because many of them stand in remote locations, they may require inspection only once every ten years, perhaps longer. These structures are typically fitted with a climbing ladder secured to the structure.

[0003] The invention relates to a new mounting device for use with an anchor assembly that has application for securing elongate safety lines in various situations and orientations, but particularly a device for use with an anchor assembly for securing a substantially vertically-oriented safety line to the climbing ladder of a tall structure.

[0004] A bottom anchor assembly for a vertical safety line is disclosed in EP1054708 and United States Patent No. US4399890 A. EP1050687 discloses a safety line anchorage assembly that has opposing brackets which can be assembled in various ways to connect a safety line to various structural members.

[0005] An improved mounting device for safety line anchor assemblies has now been devised.

[0006] According to a first aspect, the present invention provides a mounting device for a safety line anchor, the mounting device comprising a first mounting aspect and a second mounting aspect, each mounting aspect enabling mounting to a differently shaped structure, wherein one of the mounting aspects comprises a recess formation and the other of the mounting aspects comprises a shoulder formation.

[0007] It is preferred that the first and second mounting aspects are provided on opposed sides of the device.

[0008] The recess formation is capable of receiving a circular and/or square section ladder rung and the shoulder formation is provided with substantially perpendicular reaction surfaces against which the perpendicular limbs of an L shaped ladder rung can be anchored. Such an arrangement is not disclosed in the prior art. The arrangement enables the mounting device to be used with a planar flanged safety line anchor bracket, a desirable benefit which again is not suggested in the prior art.

[0009] The device preferably includes securing means for securing to the safety line anchor.

[0010] In one embodiment it is preferred that the securing means comprises one or more apertures extending through the device from one side to the other. The apertures can be used in combination with bolts to secure the mounting device to a bracket of the anchor structure, with the ladder rung (for example) clamped between the mounting device and the bracket.

[0011] It is preferred that the securing means are provided one on either side of the recess.

[0012] Beneficially, the recess formation is configured to receive a cylindrical structure with the outer circumference seating in the recess formation.

[0013] It is preferred that the recess formation is configured to taper from a relatively wide mouth to a narrow apex, preferably comprising a V shaped notch and/or having inclined surfaces.

[0014] In a preferred embodiment the shoulder formation is provided with reaction surfaces arranged substantially at right angles. Beneficially, an inclined surface extends between the reaction surfaces.

[0015] The device is preferably configured such that the shoulder formation defines a step between a relatively thicker portion of the device and a relatively narrower portion of the device. Beneficially the securing means (for example the bolt apertures) are provided one on either side of the step.

[0016] In a broad aspect, the invention provides a mounting device for a safety line anchor, the mounting device comprising a first mounting aspect and a second mounting aspect, each mounting aspect enabling mounting to a differently shaped structure.

[0017] Alternatively defined, the invention provides a mounting device for securing to a rung of a climbing ladder secured to a structure, the mounting device comprising a different mounting aspects, each mounting aspect enabling mounting to a differently shaped rung comprising two or more of a cylindrical rung, a flat plate rung or an L shaped rung

[0018] The invention also provides a safety line system (or safety line mounting system) having an anchor mounted to a structure by means of a mounting device as herein defined.

[0019] The device may secure to a mounting bracket of the safety line anchor. The anchor may be a top anchor or a bottom anchor of a vertical safety line system, for example.

[0020] According to a further aspect, the present invention provides a method of mounting a safety line to a structure (particularly a ladder rung, or the like) by means of clamping a safety line anchor to a structure using a mounting device as herein defined.

[0021] The invention will now be further described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 is a schematic perspective view of a front aspect of a mounting device in accordance with the invention;

Figure 2 is a perspective view similar to the view of Figure 1 but showing the reverse aspect of the device;

Figure 3 is a perspective view of the mounting device of Figures 1 and 2 used to mount a bracket to a cy-

cylindrical rung 4a;

Figure 4 is a perspective view of the mounting device and bracket of Figure 3 used to mount to an L-shaped rung 4b;

Figure 5 shows the mounting device 1 used to mount the anchor bracket 3 to a flat rung 4c; and

Figure 6 is a side view of an alternative embodiment of a mounting device.

[0022] Referring to the drawings and initially with respect to figures 1 to 3 there is shown a mounting device 1 for use in mounting a safety line 2, attached to an anchor bracket 3.

[0023] The anchor bracket 3 is secured to the mounting device 1 by means of bolts 9 and 10 which pass through apertures 5 and 6 in the mounting device. Retaining nuts are used to secure in position. The mounting device 1 and bracket 3 are secured so as to clamp a ladder rung 4a securely between the two. In this way the safety line 2 is effectively secured to the rung of a ladder. The anchor bracket 3 includes a planar clamping flange 3a and an arm 3b extending outwardly from the mounting device to a distal portion securing the safety line 2. This ensures that the safety line 2 can be held spaced away from the ladder rung.

[0024] It should be noted that the mounting and bracket arrangement could equally clamp to other frame structures and the versatility of the arrangement provides one of the main benefits of the invention.

[0025] As shown most clearly in figures 1 and 2, the device has different respective mounting aspects on opposed sides of the device. As shown in figure 1, the forward aspect the device 1 presents substantially perpendicular reaction surfaces 11, 12 which, in combination with an inclined connecting surface 19, define a shoulder formation 8 which provides a 'step down' from a relatively thicker portion 16 to a relatively thinner tongue portion 15 towards the top of the device as is shown in figure 1. Spaced either side of the step down shoulder formation 8 are the securing apertures 5, 6 which enable the mounting device to be secured to the bracket 3 by means of the bolts 9, 10. As an alternative to apertures 5, 6 threaded securing lugs could be formed integrally (or secured by fabrication techniques) at the positions of the apertures 5, 6 to extend through the corresponding apertures in the mounting bracket 3.

[0026] On the reverse aspect of the mounting device 1 (as shown most clearly in figure 2), there is positioned a V-shaped notch 7 having inclined surfaces that taper from a relatively wide mouth portion to a relatively narrow apex portion. The V-shaped notch 7 is positioned on the reverse aspect intermediately between the securing apertures 5, 6.

[0027] As shown in figure 3, the mounting device 1 is used with the reverse aspect presented to the anchor

bracket 3 such that the cylindrical surface profile ladder rung 4a can be clampingly received between the abutment surface of the anchor bracket 3 and within the V-shaped notch 7 such that the outer circumference of the cylindrical ladder rung 4 seats in the V-shaped notch or recess formation 7. The bolts 9, 10 are then inserted and secured with the nuts in order to ensure that the safety line anchor bracket 3 is securely fixed to the cylindrical ladder rung 4a.

[0028] As shown in figure 4 the same mounting device 1 can equally conveniently be used to secure the anchor bracket 3 to an L-shaped ladder rung 4b. In order to achieve this the forward aspect of the mounting device 1 is presented to the anchor bracket 3 with the vertical limb of the L-shaped rung 4b in abutment with the reaction surface 11 and the horizontal limb of the ladder rung 4b in contact with the reaction surface 12 of the mounting device. With the components so positioned the bolts 9 and 10 can be inserted and the securing nuts applied in order to materially clamp the safety line anchor bracket 3 to the L-shaped ladder rung 4b.

[0029] Turning now to figure 5, the same mounting device 1 is shown used to secure the anchor bracket 3 to a flat plate ladder rung 4c. As shown in figure 5 the flat plate ladder rung 4c is clamped between the bracket 3 and the reaction surfaces 17, 18 provided on the reverse aspect of the device either side of the V-shaped notch 7.

[0030] Turning now to the embodiment shown in figure 6, the mounting device 101 is of substantially uniform thickness and provided with securing apertures 105, 106. The forward aspect of the device 101 includes a slot 120 for accommodating the horizontal limb of the rung 4b, reaction surfaces 111 and 112 and an intermediate shoulder formation 108 which provides means for locating the device on an L-shaped ladder rung 4b similarly to the embodiment described in relation to figure 4.

[0031] On the reverse aspect the mounting device 101 is provided with a square recess formation 107 which can be used for locating a cylindrical ladder rung 4a. In this embodiment a flat plate ladder rung such as that shown at 4c in figure 5 can be accommodated against either mounting aspect of the device 101.

[0032] The mounting device according to the invention provides a method of mounting a safety line to a structure (particularly a ladder rung or the like) in which a single mounting device 1, 101 can be used to secure to a variety of differently shaped structures particularly cylindrical, flat plate or L-shaped structures, as described. This provides significant benefits in terms of manufacture and stock control. Additionally, the mounting device has the benefit that it can be used with a planar flanged safety line anchor bracket.

Claims

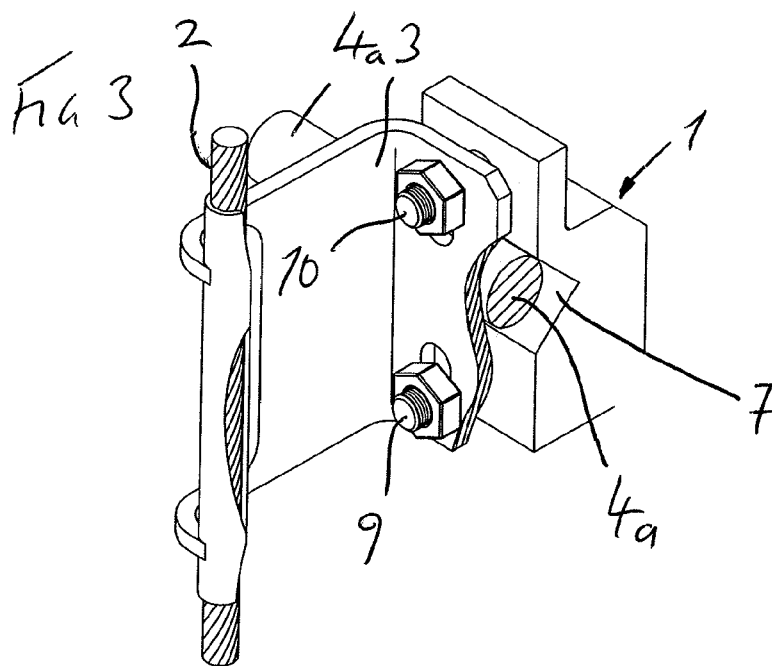
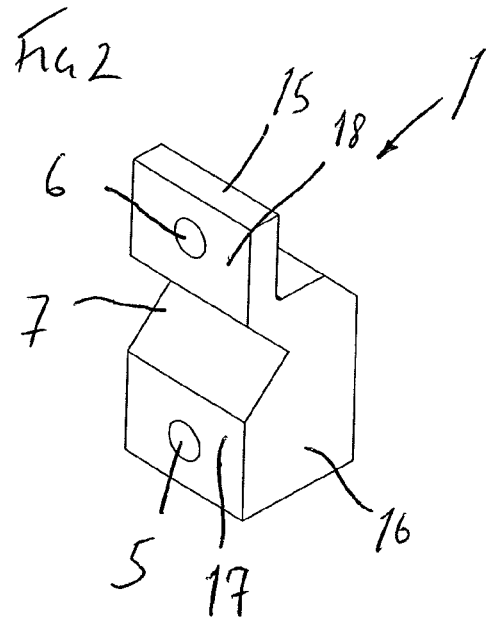
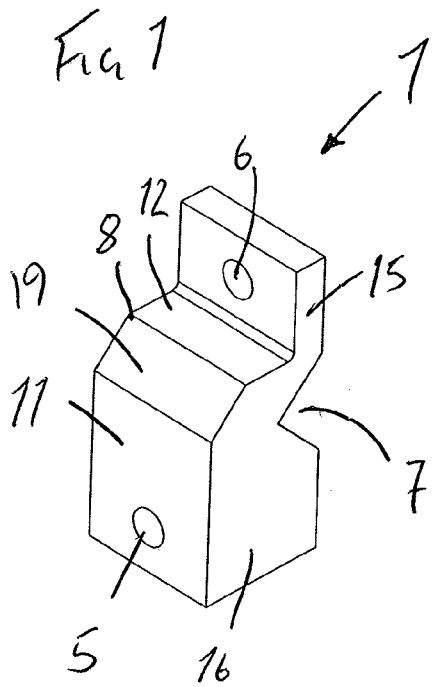
1. A mounting device for a safety line anchor, the mounting device comprising a first mounting aspect

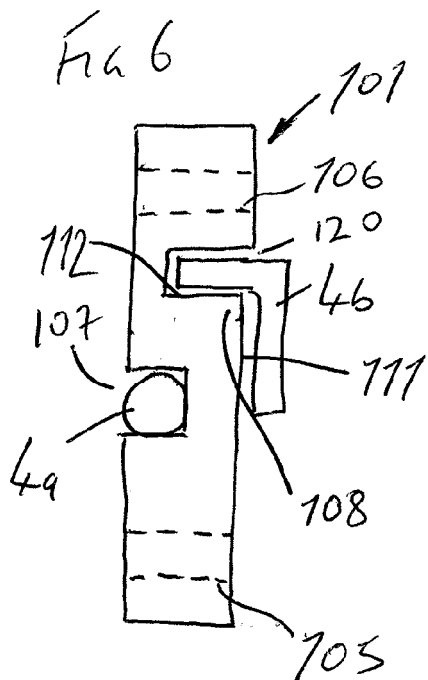
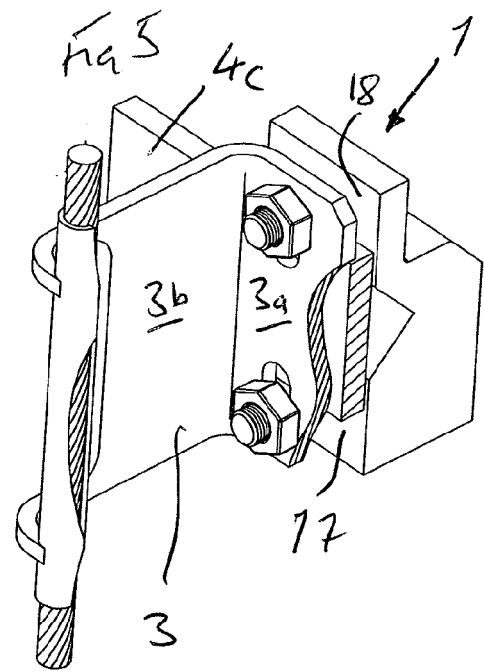
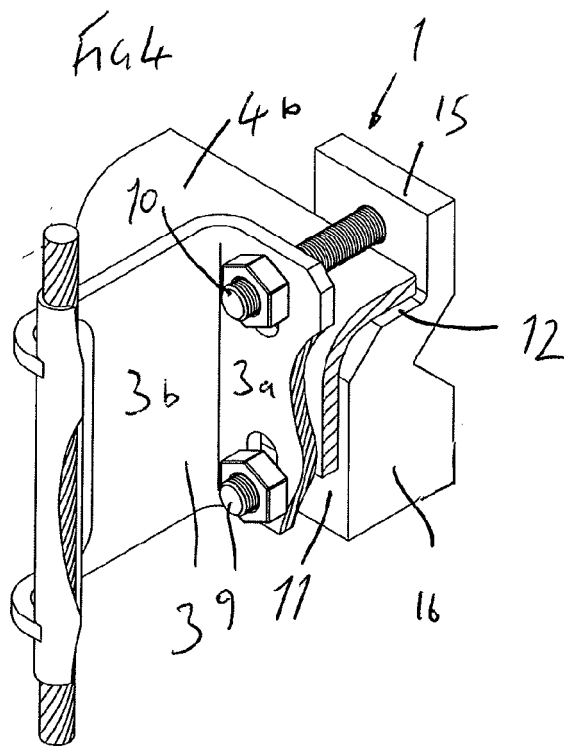
and a second mounting aspect, each mounting aspect enabling mounting to a differently shaped structure, wherein one of the mounting aspects comprises a recess formation and the other of the mounting aspects comprises a shoulder formation.

2. A mounting device according to claim 1, wherein the mounting device is provided with the recess formation and the shoulder formation on opposed sides of the device, and wherein the recess formation is capable of receiving a circular and/or square section ladder rung and the shoulder formation is provided with substantially perpendicular reaction surfaces against which an L shaped ladder rung can be anchored.
3. A mounting device according to claim 1 or claim 2, wherein the device includes securing means for securing to the safety line anchor.
4. A mounting device according to claim 3, wherein the securing means comprises one or more apertures extending through the device from one side to the other, preferably wherein the recess and the shoulder formations are provided in a zone between the securing apertures.
5. A mounting device according to claim 3 or claim 4, wherein the securing means are provided one on either side of the recess.
6. A mounting device according to any preceding claim, wherein the recess formation is configured to receive a cylindrical structure with the outer circumference seating in the recess formation.
7. A mounting device according to any preceding claim, wherein the recess formation is configured to taper from a relatively wide mouth to a narrow apex.
8. A mounting device according to any preceding claim, wherein the shoulder formation is provided with reaction surfaces arranged substantially at right angles.
9. A mounting device according to claim 8, wherein an inclined surface extends between the reaction surfaces.
10. A mounting device according to any preceding claim wherein the shoulder formation defines a step between a relatively thicker portion of the device and a relatively narrower portion of the device, preferably wherein securing means are provided one on either side of the step.
11. A mounting device for a safety line anchor, the mounting device comprising a first mounting aspect

and a second mounting aspect, each mounting aspect enabling mounting to a differently shaped structure.

12. A mounting device for securing to a rung of a climbing ladder secured to a structure, the mounting device comprising a different mounting aspects, each mounting aspect enabling mounting to a differently shaped rung comprising two or more of a cylindrical rung, a flat plate rung or an L shaped rung.
13. A mounting system for a safety line, the mounting system comprising a mounting device according to any preceding claim, in combination with an anchor bracket having:
 - i) a planar clamping flange; and/or,
 - ii) an arm extending outwardly from the mounting device to a distal portion securing the safety line.
14. A safety line system having an anchor mounted to a structure by means of a mounting device according to any preceding claim.
15. A method of mounting a safety line to a structure by means of clamping a safety line anchor to a structure using a mounting device according to any preceding claim.





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1054708 A [0004]
- US 4399890 A [0004]
- EP 1050687 A [0004]