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(54) **Arrangement for lifting a transportable unit, transportable unit therewith and method of lifting a transportable unit**

(57) The invention provides a lifting arrangement for lifting a transportable unit, the arrangement comprising a first connector element (2) provided on the unit and to which a proximal end of an elongate lifting member (1) is movably connected so as permit lowering and raising of a distal end of the elongate member (1). The position of the first connector element (2) is fixed relative to the unit, towards or at a top edge of the unit. A second connector element (3) is provided at the proximal end of the elongate member (1) and is rotatable about the first connector element (2). A third connector element (4) is provided at a distal end of the elongate member (1) for connection to a hoist. A corresponding method for lifting a transportable unit is also provided by the invention.

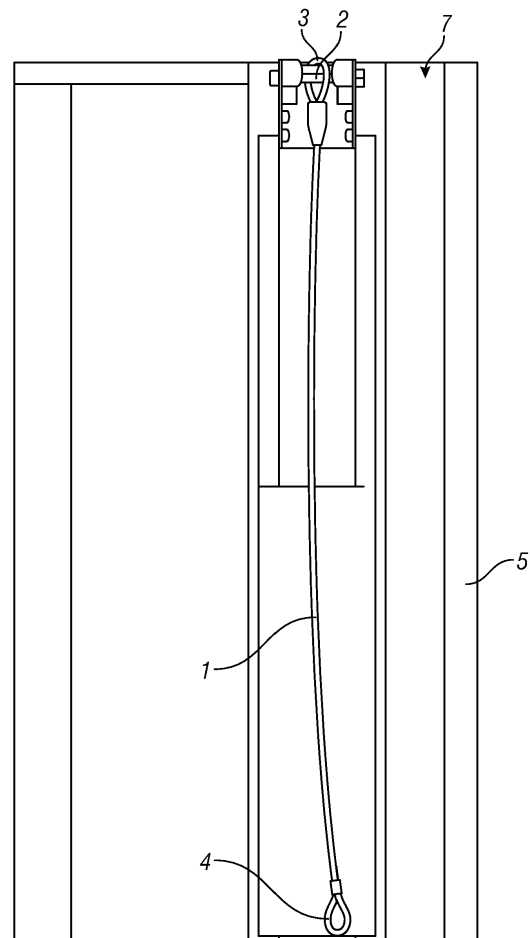


FIG. 2

Description

[0001] The present invention relates generally to lifting of transportable units such as metal shipping containers, accommodation units, welfare units, trailers and the like (hereafter referred to as 'transportable units').

[0002] Due to their purpose, transportable units often need to be moved from one location to another. For example, they need to be loaded onto ships, lorries or other means of transportation, or placed in situ on sites for the purpose of loading/unloading contents. It is common, therefore, to need to lift such transportable units in order to place them elsewhere.

[0003] Traditionally, transportable units are lifted by connecting the unit to a hoisting device such as a crane, winch or other hoisting means. This is typically achieved by hooking, or otherwise securing, chains or lines to the unit. Lifting eyes are typically provided, welded or otherwise secured to the unit, usually at the uppermost corners of such transportable units for this purpose. The eyes are sometimes provided as apertures formed at the top of the unit such that the hoist can be attached by passing a hook through the apertures. Once the lines are attached to the lifting eyes at the uppermost corners of the unit, the hoist is able to lift the unit.

[0004] However, this arrangement requires personnel to scale the unit or position a ladder and manually secure the lines via the apertures at the top corners. This poses a safety risk as there is a danger of the personnel falling from the container or ladder.

[0005] One known solution to this problem is disclosed in GB 2457076 which describes a slidable or rollable traveller retained within a channel or guide provided on the unit. The traveller has an eye formation to allow a hoist to be attached. Before use, the traveller rests at the bottom of the guide under the influence of gravity. When the hoist is attached and moved in an upward direction, the traveller is pulled up from its resting position towards the base of the unit along the guide until it hits an end stop towards the top of the unit. The unit is then lifted off the ground as the hoist is continued to be pulled.

[0006] While this solution overcomes the need for personnel to climb on top of the unit to attach the hoist, it comprises a number of components (some of which are configured for translational movement of the traveller) which contributes to an increased manufacturing cost.

[0007] Thus, it is an object of the invention to provide a means of lifting a transportable unit without the need for personnel to scale the unit, thus eliminating the risk of injury posed by falling, whilst reducing the manufacturing costs associated with known solutions.

[0008] An improved solution has now been devised.

[0009] Thus in accordance with the present invention, there is provided a lifting arrangement and corresponding method as defined in the appended claims.

[0010] Thus, there is provided a lifting arrangement for lifting a transportable unit, the arrangement comprising a first connector element provided on the unit and to

which a proximal end of an elongate lifting member is movably connected so as permit lowering and raising of a distal end of the elongate member.

[0011] Preferably, the first connector element is provided on a wall of the unit. The wall may be a side wall.

[0012] The transportable unit may be a shipping container, accommodation unit, welfare unit or trailer.

[0013] Preferably, the proximal end of the elongate lifting member is moveably connected so as to permit lowering and raising of a distal end of the elongate member relative to the proximal end.

[0014] Preferably, the lifting arrangement further comprises:

a second connector element provided at the proximal end of the elongate member, the second connector element being rotatable about the first connector element; and

a third connector element provided at a distal end of the elongate member for connection to a hoist.

[0015] Thus, the second and third connector elements may be provided at or towards opposite ends of the elongate member.

[0016] Preferably, the position of the first connector element is fixed relative to the unit. Thus, the elongate member remains attached to the unit at the same point during use of the lifting arrangement.

[0017] Preferably, the length of the elongate member is selected to facilitate connection of the unit to the hoist by the user standing at or towards the base or lower edge of the unit.

[0018] The elongate lifting member may be an arm. The elongate lifting member may be rigid. It may be curved. If curved, it may be curved such that when the elongate member is in the lowered position, it forms a C shape with the back of the C resting against the unit. Alternatively, the elongate member may be substantially straight.

[0019] The elongate lifting member may be flexible and may be provided in the form of a lanyard, chain or other flexible line. The elongate member may be formed from any suitable material. For example, it could be formed using a metal such as steel, or a fabric having sufficient strength to effect safe lifting of the unit.

[0020] Preferably, rotation of the second connector element about the first connector element enables the elongate arm to be moved between a first position wherein the third connector element is raised, and a second position wherein the third connector element is lowered to facilitate connection of the arm to the hoist by a user positioned at the base of the unit. Thus, the arm is operable to move between a lowered and a raised position. In the lowered position, the third connector element is within reach of someone standing on the ground, or level with a lower portion of the unit, such that the elongate element can be connected to the hoist without the user having to climb a ladder or scale the unit.

[0021] During use, the hoist is connected to the third connector element and subsequently lifted, causing the third connector element to move upwards into a raised position.

[0022] The third and/or second connector element may be an eye formation or hook.

[0023] Preferably, the first connector element is provided towards or at the top of the unit. It may be flush with a wall of the unit, or provided adjacent a wall of the unit. It may comprise a projection, pin, branch or bar. It may comprise a portion of the unit bordering an aperture formed in the unit.

[0024] The first connector element may be formed integrally with the unit, or may be attached to the unit by securing means such as welding, bolting or any other attachment means. It may be provided on a plate or other component which is secured to the unit. It may be detachable from the unit. It may be retro-fitted to an existing unit.

[0025] The second connector element may be configured to pivot about the first connector element. At least a portion of the first connector element may be confined or encircled by at least a portion of the second connector element. For example, the second connection element may be an eye formation and the first connection element may be a bar arranged to pass through the eye. Alternatively, the second and first connector elements may form a hinged arrangement. Alternatively still, the first connector element may comprise an aperture or channel formed in the unit and the second connector element may be a hook, eye formation configured to pass through the aperture.

[0026] However, the invention is not limited in respect of the form of the connector elements or the way in which they interconnect. Other arrangements may be readily apparent to the skilled addressee which provide the same functionality i.e. a component attached to a unit, about which one end of an elongate arm is able to rotate such that the other end of the arm can be raised or lowered during use.

[0027] At least a portion of the lifting arrangement may be recessed into the unit. For example, the first connector element may be provided in a groove or channel formed in a wall of the unit. The elongate member may be suitably dimensioned to fit at least partially within the recess.

[0028] Also in accordance with the present invention there is provided a transportable unit having at least one lifting arrangement according to any preceding claim. A lifting arrangement as described above may be provided at each corner of the unit.

[0029] The first connector element of at least one of the lifting arrangements may comprise an aperture or channel formed in or on the unit, and at least a portion of the proximal end of the elongate member may be configured to pass partially or completely there through.

[0030] Also in accordance with the present invention there is provided a method of lifting a transportable unit, comprising the step:

moveably connecting a proximal end of an elongate lifting element to a connector element provided on the unit so as to permit lowering and raising of a distal end of the elongate member.

[0031] The method may further comprise the steps:

providing a second connector element at the proximal end of the elongate member, the second connector element being rotatable about the first connector element; and

providing a third connector element at a distal end of the elongate member for connection to a hoist.

[0032] The method may also include the step of providing the first connector element on a wall of the unit. The wall may be a side wall.

[0033] The elongate member may be an arm. It may be a rigid arm.

[0034] The transportable unit may be a shipping container, accommodation unit, welfare unit or trailer.

[0035] The proximal end of the elongate lifting member may be moveably connected so as to permit lowering and raising of a distal end of the elongate member relative to the proximal end of the elongate member.

[0036] The method may further comprise the step:

fixing the position of the first connector element relative to the unit.

[0037] These and other aspects of the present invention will be apparent from and elucidated with reference to, the embodiment described herein.

[0038] An embodiment of the present invention will now be described, by way of example only, and with reference to the accompany drawings, in which:

Figure 1 shows a first connector element for use with an embodiment of the invention, the connector element being attached to the wall of a transportable unit.

Figure 2 shows an embodiment of the invention having an elongate member attached to the connector element of Figure 1, the elongate member being shown in the lowered position prior to use.

Figure 3 shows in more detail the proximal end of the elongate member of Figure 2, wherein the first connector element of Figure 1 is shown passing through an eye formation provided on the proximal end of the elongate member.

[0039] The lifting arrangement of Figure 2 is shown having an elongate arm 1 attached to a first connector element 2 provided on a transportable unit. The arm 1 is shown in figure 2 as a rigid steel cable although a flexible line could also be used to the same effect.

[0040] The arm 1 has second 3 and third 4 connector elements provided at each end. The second 3 and third 4 connector elements are shown in this embodiment as eye formations. The third connector element 4 is provided at the distal end of the arm 1 (hereinafter referred to as the 'distal eye') and enables the distal end of the arm to be attached to a hoist by passing a hook provided on the hoist (not shown) through the distal eye 4.

[0041] The second connector element 3 is provided at the other (proximal) end of the arm. This is hereinafter referred to as the 'proximal eye' 3.

[0042] The first connector element 2 comprises a bar provided on the unit. The bar 2 passes through the proximal eye 3 so that the proximal end of the arm is securely connected to the unit 5 but is able to rotate about the bar 2.

[0043] In the figures the bar 2 is shown provided on a plate 6 which is bolted within an elongate, upright recess 8 formed in a side wall of the unit 5. This is most clearly shown in Figure 1. However, the bar 2 could be secured to the unit 5 in any other suitable manner, or the bar 2 could be integrally formed with the unit 5. Alternatively still, the proximal end of the arm may form a hook which passes through an aperture formed in the unit 5 such that a portion of the unit surrounding the aperture serves as the bar. Other configurations may be used to connect the proximal end of the arm to the unit, but essentially the connection is such that the proximal end of the arm is able to pivot or rotate at the point of connection to the unit so that the other, distal end of the arm can be raised or lowered during lifting or lowering of the unit. During use, the distal end of the arm is raised or lowered relative to the proximal end of the arm.

[0044] The connection between the proximal end of the arm and the unit may be permanent such that the arm 1 cannot be disconnected from the unit 5, or may be configured to permit removal (disconnection) of the arm 1 when it is not required for lifting or lowering of the unit 5. The invention is not intended to be limited with respect to the manner or configuration of the connection between the arm 1 and the unit 5.

[0045] The arm 1 is attached to the unit 5 at or towards the upper edge of the unit 7. Before use, the arm 1 hangs downwardly from the bar 2 in a lowered position under its own weight such that the distal end of the arm lies within reach of the user (not shown) without the user needing to scale the unit or use climbing apparatus. The length of the arm 1 is selected as appropriate so that the distal eye 4 is within reach of the user.

[0046] A plurality of lifting arrangements is secured to the unit to facilitate lifting. Therefore, in a preferred embodiment a lifting arrangement as described above is provided on each corner of the unit.

[0047] During use, the user attaches the distal end of the arm to the hoist by passing a hook through the distal eye 4 of each lifting aid. As the hoist moves upwardly, each arm 1 rotates about the bar 2 passing through its respective proximal eye 3. Thus, the distal end of the arm moves in an arcuate motion from the lowered position to

the raised position as the proximal end of the arm rotates about the bar 2. When the lines of the hoist become taught, the inner rim of the proximal eye 3 is pulled against the bar 2 and continued hoisting causes the unit 5 to be pulled upwardly. To lower the unit 5, the operation is reversed.

[0048] Thus, the invention provides a lifting arrangement which is mechanically simple and comprises fewer moving components than the prior art arrangements. This reduces manufacturing costs.

[0049] The user can stand on the ground to attach or detach the hoisting equipment rather than having to scale the unit and therefore risk injury.

[0050] It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be capable of designing many alternative embodiments without departing from the scope of the invention as defined by the appended claims. In the claims, any reference signs placed in parentheses shall not be construed as limiting the claims. The word "comprising" and "comprises", and the like, does not exclude the presence of elements or steps other than those listed in any claim or the specification as a whole. The singular reference of an element does not exclude the plural reference of such elements and vice-versa. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

Claims

1. A lifting arrangement for lifting a transportable unit, the arrangement comprising a first connector element provided on the unit and to which a proximal end of an elongate lifting member is movably connected so as permit lowering and raising of a distal end of the elongate member.
2. A lifting arrangement according to claim 1 wherein:
 - i) the position of the first connector element is fixed relative to the unit; and/or
 - ii) the first connector element is provided towards or at a top edge of the unit; and/or
 - iii) the first connector element comprises a projection, pin, branch or bar; and/or
 - iv) the first connector element is provided on a wall of the unit, preferably a side wall; and/or
 - v) the proximal end of the elongate lifting member is moveably connected so as to permit lowering and raising of a distal end of the elongate member relative to the proximal end; and/or
 - v) the transportable unit is a shipping container, accommodation unit, welfare unit or trailer.
3. A lifting arrangement according to any preceding

claim and further comprising:

a second connector element provided at the proximal end of the elongate member and being rotatable about the first connector element; and
a third connector element provided at a distal end of the elongate member for connection to a hoist.

4. A lifting arrangement according to claim 3 wherein rotation of the second connector element about the first connector element enables the elongate element to be moved between a first position wherein the third connector element is raised, and a second position wherein the third connector element is lowered to facilitate connection of the elongate member to the hoist by a user positioned at a lower edge or base of the unit.

5. A lifting arrangement according to claims 3 or 4 wherein:

i) the third and/or second connector element is an eye formation or hook; and/or
ii) at least a portion of the first connector element is confined or encircled by at least a portion of the second connector element; and/or
iii) the second connector element is configured to pivot about the first connector element; and/or
iv) the second and first connector elements form a hinged arrangement.

6. A lifting arrangement according to any preceding claim wherein:

i) the elongate member is a rigid arm; and/or
ii) the elongate member is a flexible line; and/or
iii) at least a portion of the lifting arrangement is recessed into unit; and/or
iv) the first connector element is flush with a wall of the unit, or adjacent a wall of the unit; and/or
v) the elongate member is curved, or substantially straight.

7. A lifting arrangement according to any preceding claim wherein the first connector element:

i) is formed integrally with the unit; or
ii) is detachable from the unit.

8. A lifting arrangement according to any preceding claim wherein the length of the elongate member is selected to facilitate connection of the unit to the hoist by a user standing at or towards the base of the unit.

9. A transportable unit having at least one lifting arrangement according to any preceding claim.

10. A unit according to claim 9 wherein a lifting arrangement as claimed in any of claims 1 to 9 is provided at each corner of the unit.

11. A unit according to claim 9 or 10 wherein the first connector element of at least one of the lifting arrangements comprises an aperture formed in or on the unit and at least a portion of the proximal end of the elongate member is configured to pass partially or completely through the aperture.

12. A method of lifting a transportable unit, comprising the step moveably connecting a proximal end of an elongate lifting element to a connector element provided on the unit so as to permit lowering and raising of a distal end of the elongate member.

13. A method according to claim 12 further comprising:

providing a second connector element at the proximal end of the elongate member, the second connector element being rotatable about the first connector element; and
providing a third connector element at a distal end of the elongate member for connection to a hoist.

14. A method according to claim 12 or 13 further comprising:

i) fixing the position of the first connector element relative to the unit; and/or
ii) providing the first connector element on a wall of the unit, preferably a side wall.

15. A method according to claim 12 to 14 wherein:

i) the elongate member is an arm, preferably a rigid arm; and/or
ii) the proximal end of the elongate lifting member is moveably connected so as to permit lowering and raising of a distal end of the elongate member relative to the proximal end of the elongate member; and/or
iii) the transportable unit is a shipping container, accommodation unit, welfare unit or trailer.

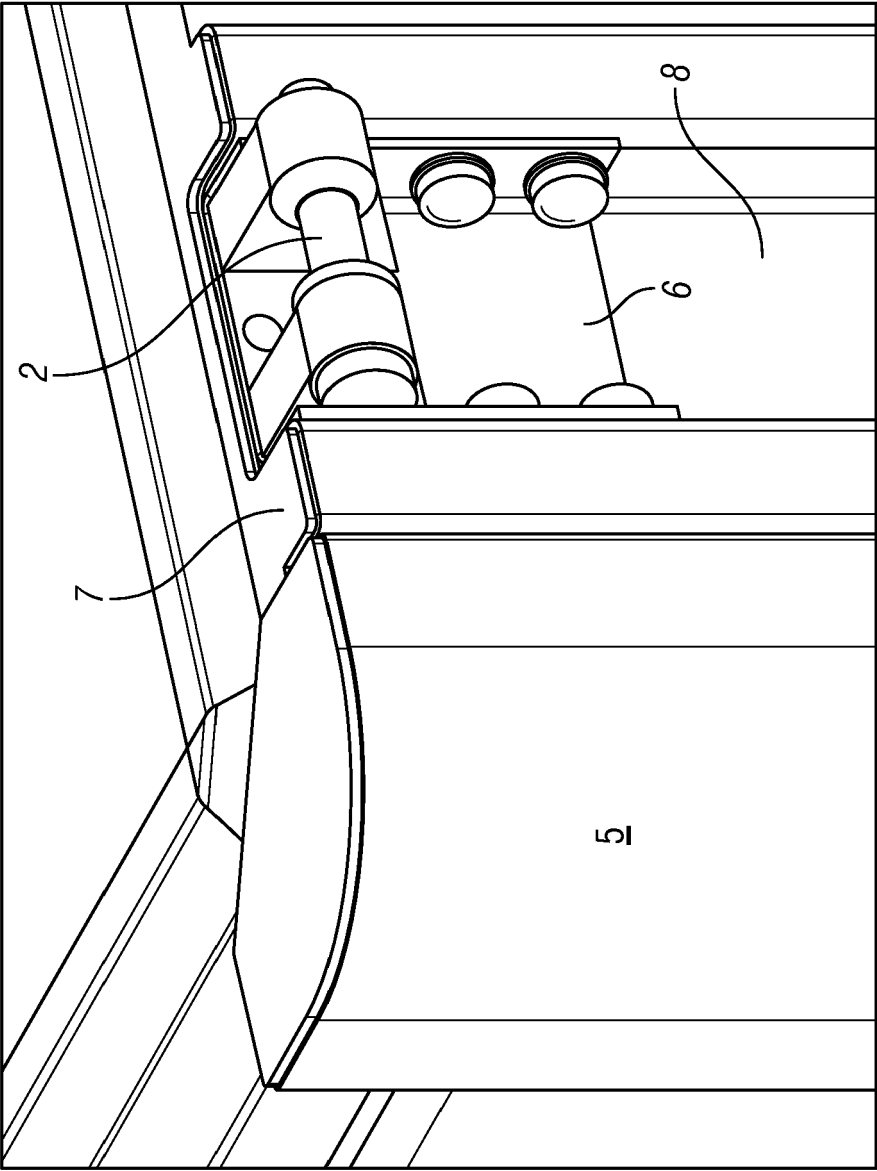


FIG. 1

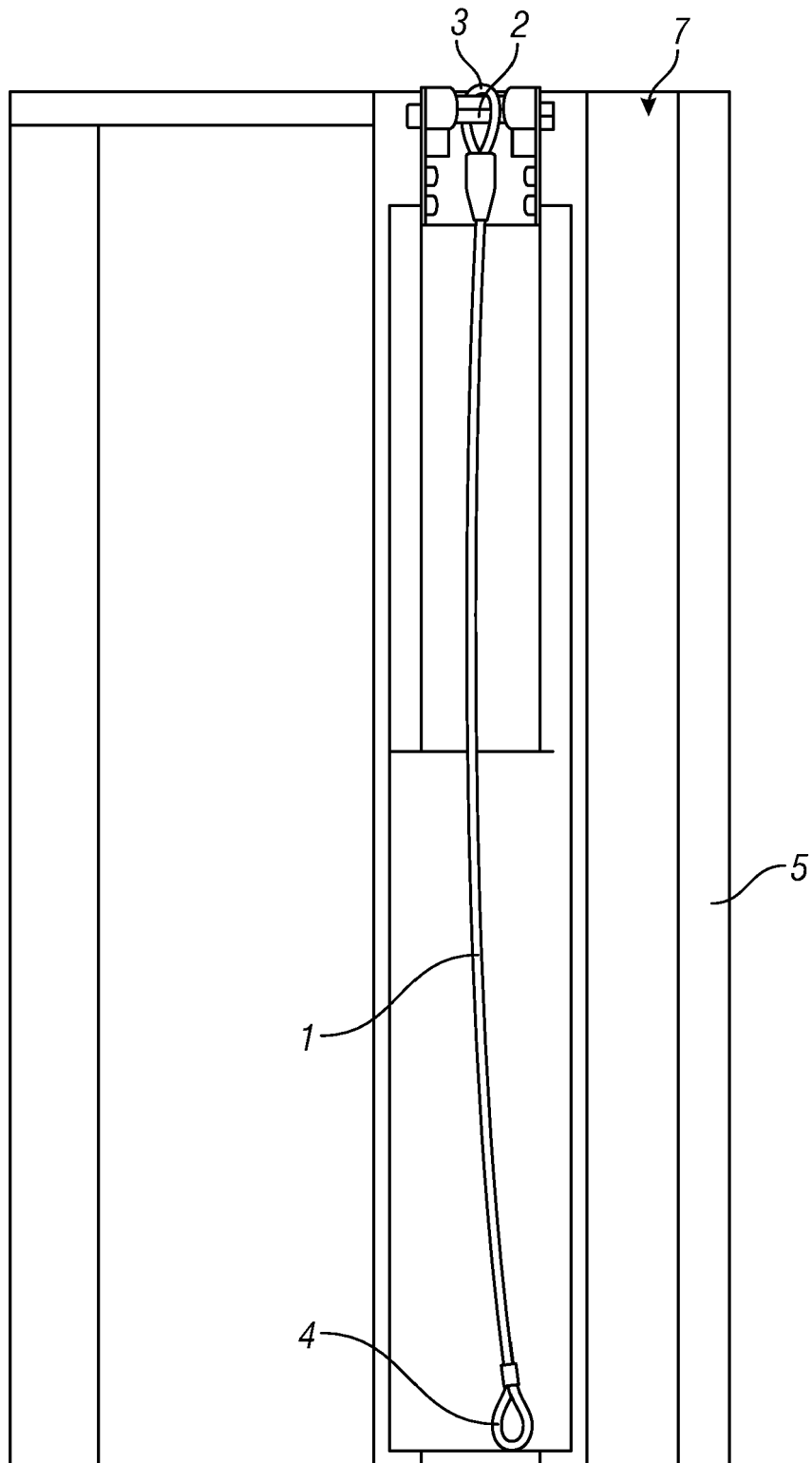


FIG. 2

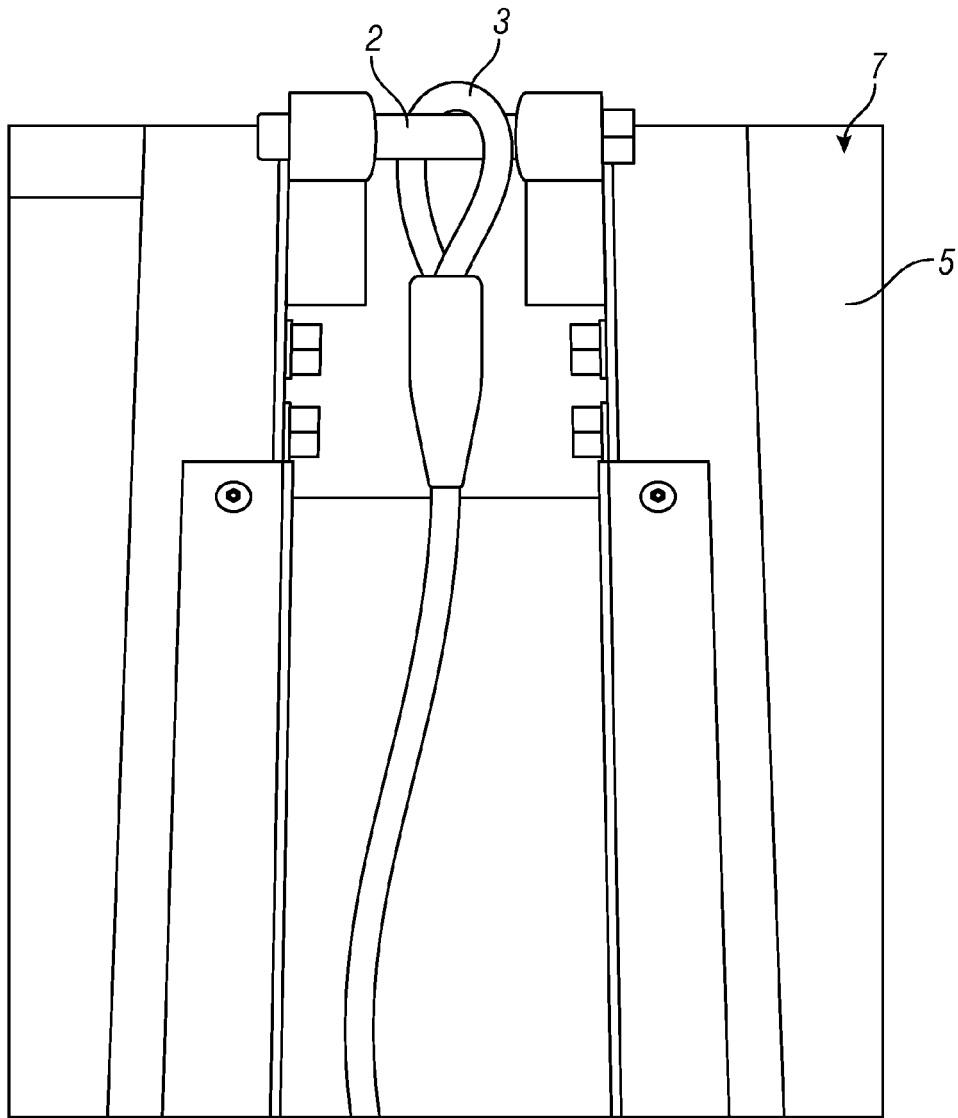


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 12 19 7066

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 1 271 299 A (BRITISH ROPES LTD) 19 April 1972 (1972-04-19) * page 1, column 2, line 70 - page 2, column 2, line 90 * * figures 1-7 *	1-15	INV. B65D90/00
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X	US 7 520 707 B1 (NESS DANIEL W [US]) 21 April 2009 (2009-04-21) * column 2, line 57 - column 3, line 31 * * figures 1-4, 6 *	1-15	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D B66C
3	Place of search Munich	Date of completion of the search 6 March 2013	Examiner Piolat, Olivier
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1503 03.82 (P04C01)

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

EP 12 19 7066

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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06-03-2013

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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