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(54) **CONNECTION UNIT FOR A LIFTING ARRANGEMENT AND SUCH A LIFTING ARRANGEMENT**

VERBINDUNGSEINHEIT FÜR EINE HUBEINRICHTUNG UND EINE HUBEINRICHTUNG

UNITÉ DE CONNEXION POUR UN AGENCEMENT DE LEVAGE ET UN TEL AGENCEMENT DE LEVAGE

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Description

Field of the Invention

[0001] The present invention relates to a connection unit for a lifting frame for lifting a weak or disabled person, when the person has to be moved from one place to another, said connection unit comprising a housing with a vertical and a horizontal direction and having a through-going horizontal hole and a shaft for mounting a lifting frame construction.

[0002] The invention further relates to a lifting arrangement comprising such a lifting frame with the connection unit and a method for lifting.

Background of the Invention

[0003] Lifting arrangements of the above kind are commonly known and used in hospitals and (nursing) homes when a weak or disabled person needs to be moved from e.g. a sitting position in a chair to a laying position in a bed.

[0004] An apron is arranged under the person to be lifted and the apron is attached to the lifting frame, which is attached to a hoist. The hoist is usually arranged on a stationary or moveable stand or frame. Alternatively the hoist is suspended from wall-mounted or ceiling-mounted rails. A moveable frame is a two-stand frame e.g. with wheels for positioning of the hoist prior to a lifting procedure and/or for removing after a lifting procedure. A stationary frame may be e.g. a four-stand frame with a rail suspended there between.

[0005] During such relocation of a person the lifting frame construction may be rotated back and forth about a vertical axis, and further respective frame parts of the lifting frame construction may be angle rotated relative to each other in order to change the position of the person being lifted from a sitting position to a laying position or vice versa. During such operation the lifting frame construction may due to a rigid connection between the connection unit and the lifting frame construction tilt so that the mass center of the lifting frame construction including the person being lifted is not lying on a straight vertical line below the suspension point under the hoist.

[0006] This may cause some unfortunate forces to occur in the connection unit and furthermore that the person is sitting or lying in an uncomfortable manner.

[0007] Known lifting frame constructions or arrangements are often suspended under a hoist hanging from e.g. a ceiling rail or a stand via a strap or wire, in the following called a lifting strap. The lifting strap may in an unfortunate manner be twisted when the lifting frame construction is rotated about a vertical axis. This may result in the lifting strap getting stuck in the hoist if the lifting strap is rolled up in the hoist when the lifting strap is twisted.

[0008] In some cases the known lifting arrangements comprise electrical components, such as an actuator for moving the individual parts of the lifting frame construction relative to each other. In such cases the electrical cord, which supplies electricity or control signals to the electrical actuator, may be twisted and wrapped around the lifting frame construction in an unfortunate way, and thus preventing any movement of the person, which may become stuck in the hoist because he or she cannot be lowered. CA 2374118 and DE 29503098U1 disclose a connection unit in a lifting arrangement for lifting a weak or disabled person.

[0009] Thus, there is room for improving the lifting equipment to further reducing such situations during lifting of persons and to further improve easy and smooth moving and/or lifting procedure and less discomfort for the person when lifted.

Object of the Invention

[0010] The object of the present invention is to provide a lifting arrangement and method by which the above mentioned disadvantages are reduced or eliminated.

[0011] A further object is to provide a lifting arrangement and where the lifting frame construction may be freely rotated about a vertical axis without the strap in which the lifting arrangement is twisted.

[0012] A further object is to provide a lifting arrangement and method where the lifting frame construction may be freely rotated about a vertical axis without the strap in which the lifting arrangement is twisted, and freely rotatable about a second horizontal axis to improve comfort for the person who is lifted or lowered.

[0013] A further object is to provide a lifting arrangement and method where the lifting frame construction provides no risk that electrical cords, which supply power and/or control signals to an electrical actuator on the lifting frame, are twisted and wrapped around the lifting frame construction.

Description of the Invention

[0014] The present invention relates to a lifting frame in a lifting arrangement according to claim 1..

[0015] In this way the mounting shaft for mounting the lifting frame construction and thus also the lifting frame construction itself will rotate about the central axis of said mounting shaft. This ensures that the mass center of the lifting frame construction including the person being lifted is lying on a straight vertical line below the suspension point. Hence, the connection unit is always suspended vertically under the hoist and thus in a straight line under the strap or wire in which the lifting frame is suspended. Thus, any unfortunate force occurring in the connection unit is kept at a minimum and the person is sitting or lying in the lifting arrangement in a more comfortable manner. In addition, in order to avoid that the hoist strap or wire, in which the lifting arrangement is suspended, becomes twisted it is preferred that the connection unit is divided in an upper part and a lower part, which parts are rotatable relative to each other about a vertical axis via a rotational

joint. In this way the lifting frame construction may be freely rotated about the vertical axis without twisting the strap or wire, in which the lifting arrangement is suspended. This also ensures that the hoist does not stop because the twisted strap or wire is rolled up into the hoist body and gets stuck inside the hoist body.

[0016] The housing of the connection unit comprises an upper part and a lower part. The upper part of the connection unit comprises a vertical central shaft (when seen as in suspension under the hoist). The upper end of the central shaft comprises connection means for attaching the connection unit to the strap or wire of the hoist.

[0017] The connection means are e.g. an eye or ring for attaching a hook member on the hoist's strap or wire. Alternatively, the connection means comprise a hook that engages a ring member on the hoist strap or wore.

[0018] A flange is provided at the lower end of the central shaft. The flange preferably extends perpendicularly from the outer surface of the central shaft. The flange connects the central shaft to the lower part of the housing via a rotational joint.

[0019] The rotational joint is preferably a bearing, and in particular a ball bearing or any corresponding type of bearing that allows free rotation of the upper and lower part of the housing while also being able to carry the load suspended in the lifting arrangement. This is necessary as this rotational joint carries the load because the lower part of the connection unit is also attached to the rotational joint and thus carries the entire load of the person being lifted.

[0020] The rotational joint is attached to the upper surface of the flange on the central shaft.

[0021] The lower part of the housing is attached to the other part of the rotational joint/ball bearing. The lower part comprises a hollow cylindrical housing having an inwardly extending flange at the upper end of the lower housing part's body.

[0022] The central shaft is arranged centrally inside the lower cylindrical part from below and with the rotational joint between the flanges.

[0023] Thus, the inwardly extending flange on the lower housing part is attached to the rotational joint at the opposite side in relation to the central shaft to allow the central shaft and the lower part of the housing to rotate freely in relation to each other.

[0024] The lower end of the lower part of the housing is provided as an end plate or an end cap that is attached in the opening in the lower end of the cylindrical housing. The end cap may be attached to the cylindrical housing e.g. by a threaded connection, snap action locking mechanism or a male-female connection. A male-female connection may e.g. comprise a circumferential shoulder on the outer surface of the end cap that engages a corresponding groove on the internal surface of the cylindrical housing or vice versa.

[0025] The upper part of the central shaft extends upwardly from the top end of the cylindrical lower part of the housing. The central shaft may be surrounded by a housing top cap. This housing top cap is attached to the central shaft. This central shaft provides protection for the rotational joint.

[0026] The lower part of the housing comprises a through-going bore. The through-going bore is provided perpendicularly to the longitudinal axis of the lower housing part, i.e. horizontally when seen in suspension vertically under a hoist. Since the lower part of the housing is preferably hollow, the through-going bore is preferably made of two diametrically opposed holes in the lower part of the housing.

[0027] A mounting shaft is mounted in said through-going bore in a rotatable manner. The mounting shaft is longer than the diameter of the connection unit and thus extends through the connection unit and thus horizontally outwards from the connection unit housing (when seen in suspension under a hoist).

[0028] The mounting shaft is provided for mounting a lifting frame constriction to the connection unit as described in further details below. The mounting shaft is rotatable about the longitudinal axis of the mounting shaft, i.e. about an axis that is perpendicular to the central shaft. This allows the lifting frame construction to be tilted in relation to the connection unit.

[0029] In order to allow the mounting shaft to rotate freely in the connection unit, the mounting shaft may be arranged in said bore in one or two linings or slide bearings. The linings or slide bearings are preferably made of low friction resin material. The low friction material may e.g. be as nylon, ABS, or polyamide, optionally with one or more low friction additives, such as glass beads, Teflon and/or MoS2.

[0030] An adjustment screw may engage a threaded bore in the mounting shaft. The length at which the adjustment screw extends from the threaded bore may be adjusted to adjust and/or restrict the free rotation of the mounting shaft to each side. This ensures that that the mounting shaft cannot be rotated more than once around its own axis when the adjustment screw is engaged in the circumferential groove.

[0031] The restriction of the rotation of the mounting shaft may e.g. be up to $\pm$ 90 degrees in relation to a vertical plane, or preferably up to $\pm$ 75 degrees or more preferred or preferably up to $\pm$ 60 degrees.

[0032] The mounting shaft is for mounting of the lifting frame arrangement to the connection unit. The lifting frames of hoists are usually made of hollow pipes, e.g. aluminium or steel pipes or pipes made of suitable composite materials. Thus, the lifting frame is easily mounted by inserting the mounting shaft into the void. The lifting frame may then be secured to the mounting shaft by conventional attachment means, e.g. screws or rivets arranged in bores through the lifting frame pipes and corresponding bores provided in the mounting shaft. If screws are used, the bores in at least the mounting shaft are preferably threaded. Optionally, the corresponding bores in the lifting frame construction are threaded to engage with corresponding screws. Alternatively, the

screws may be secured by nuts.

[0033] The lifting frame according to the present invention further comprises at least two frame parts. These frame parts are connected via links that allow the two frame parts to be moveable in relation to each other, in particular by rotation.

[0034] Such lifting frame with moveable frame parts may be moved manually in relation to each other or by means of an electrical actuator. This allows to adjust the position of the person in the apron to sitting or lying position to adjust to the place or item, such as bed, chair, wheelchair etc. to and/or from which they are lifted. This improves the comfort of the person that is suspended in the apron.

[0035] The lifting frame according to the invention comprises an electrical actuator for changing the position of at least one frame part relative to another frame part, and wherein the actuator is connected to one or more cords being mounted inside the lifting frame construction and the connection unit. The electrical actuator is at its one end mounted to one of the frame parts and at its other end to the other frame part. The electrical actuator thus can change the position of the at least two frame parts relative to each other.

[0036] This enables the assisting person to adjust the position of the person to the place where the person is to be moved by adjusting the position during lifting without the need for manual labour. Further by arranging the cords inside the lifting frame, there is no risk that the lifting frame becomes entangled in the electrical cords for the electrical actuator. Similarly the risk of crushing the electrical cords between moving parts of the lifting frame is elegantly eliminated. In addition, by arranging the electrical cords inside the lifting frame, it becomes easier to clean and maintain clean and hygienic.

[0037] Preferably, the lifting frame construction comprises counterweights that are arranged inside the pipes of the lifting frame construction for ensuring balance of the construction, especially when an electrical actuator is arranged at one side of the lifting frame. This further assists to prevent that the lifting frame is suspended askew.

[0038] The connection unit according to the present invention thus preferably also comprise one or more electrical connections, usually cords that are arranged to pass through the housing and the mounting shaft. Hereby the electrical cords are completely removed from the exterior surface of the lifting frame construction. Thus, the electrical cord(s) enters the connection unit at the upper end, e.g. through the top cap and into an interior space of the vertical shaft of the connection unit. The central vertical shaft may comprise a radial and a central, vertical boring for insertion of the electrical cord(s).

[0039] In order to ensure that the electrical cords do not twist when the parts of the connection unit rotate in relation to each other, the connection unit preferably comprises a rotatable electrical connector with two parts that rotate with the upper and the lower part of the housing, respectively, to which parts a first and a second part of the electrical cord are attached. This type of sliding contact is sometimes called a slip ring connection. This eliminates the risk of the cords being twisted and potentially torn.

[0040] One part of the slip ring connector is connected to the vertical shaft and another part is connected to the cylindrical housing, e.g. via an internal flange. Thus, when the housing is rotated in relation to the vertical central shaft the slip ring ensures that the electrical cords are not twisted inside the connection unit.

[0041] The electrical cord(s) further extend into the interior of the lifting frame construction, i.e. inside the pipes. This may be accomplished by providing the mounting shaft in the connection unit which comprises a longitudinal groove for mounting of the one or more electrical cords. The longitudinal groove preferably extends in axial direction from near the middle of the mounting shaft and towards at least one of the ends of the mounting shafts, preferably in a straight or slightly helical manner.

[0042] Thus, when the lifting arrangement is assembled, the electrical cord may extend from the outside through first the radial boring, then the central boring and then the longitudinal groove in the frame part. In this way, the lifting frame construction may be rotated relative to the stationary portion, being the central vertical shaft, without the electrical cord being twisted and/or without being wrapped around the lifting frame construction.

[0043] The present invention also provides a lifting arrangement for lifting and/or moving weak or disabled persons, comprising a hoist such as a hoist arranged on a movable frame or a ceiling or wall mounted rail, and where said lifting arrangement further comprises a lifting frame arrangement as described above and with a connection unit as described above which is attached to a cable, wire or strap of the hoist.

[0044] The present invention also provides a method for lifting and/or moving weak or disabled persons. The method comprises arranging a lifting frame with a connection unit as described above on a hoist, and arranging a person in a lifting apron and attaching the apron to the lifting frame. The method further comprises the step of activating the hoist for lifting and/or lowering the person and /or moving the person suspended under the hoist while being lifted.

Description of the Drawing

[0045] The present invention will in the following be described in more detail with reference to the figures in which

Fig. 1 shows a lifting frame construction,

Fig. 2 shows a connection unit and part of the lifting frame construction,

Figs. 3a-3b show a cross section of the connection

unit and part of the lifting frame construction, and a top view of the connection unit respectively,

Fig. 4 shows an exploded view of the connection unit and part of the lifting frame construction, and

Fig. 5 shows a lifting frame construction suspended in a rail mounted hoist.

Detailed Description of the Invention

[0046] Fig. 1 shows a lifting frame construction 1 and fig. 5 shows a lifting frame construction 1 suspended in a hoist 2. The hoist 2 is in fig. 5 arranged in moveable manner in rails 3, which are typically mounted in a ceiling in a room or a number of rooms. The hoist 2 may alternatively be arranged in a stationary or moveable frame (not shown) as discussed above. The lifting frame construction 1 is suspended in a strap 4 and can be lowered or raised by the hoist 2 by lowering or raising the strap 4.

[0047] The lifting frame construction 1 shown in fig. 1 comprises a first frame part 5 and a second frame part 6, which are connected via links 8 allowing the two frame parts 5,6 to be rotated in relation to each other. This provides a sitting position or a lying position for the person to be lifted. The rotation of the two frame parts 5, 6 relative to each other are performed manually (not shown) in a per se known manner or preferably by means of an electrical actuator 7. The electrical actuator 7 is at its one end mounted to the first frame part 5 and at its other end to the second frame part 6.

[0048] The lifting frame construction 1 further comprises a number of arms 9, which are connected to one of the frame parts 5, 6 via links 10. The arms 9 comprise projections 9a for mounting of an apron (not shown) to support the person to be lifted.

[0049] As shown in fig. 1 the lifting frame construction 1 is connected to a connection unit 11, from which an attachment means 15 projects at the top end for allowing it to be attached to the strap 4 of the hoist 2. In the figures the attachment means 15 are shown as a ring-like member to which a hook member attached to the hoist strap 4 may be attached. The attachment means 15 attached to the top of the connection unit 11 may also be a hook member if the hoist strap 4 comprises a ring member for attachment of the lifting frame construction 1.

[0050] In figs. 2-4 the connection unit 11 is shown. Fig. 3a and 4 show the connection unit 11 in a cross section and exploded view. The connection unit 11 comprises an upper part and a lower part. The upper and lower parts can rotate freely in relation to each other about a vertical axis (when seen suspended under a hoist). The upper part comprises a vertical central shaft 12 surrounded by a top cap 13. The attachment means 15 for attachment to the hoist strap 4 is attached to the upper end of the central shaft 12 with attachment means e.g. screws/bolts and 16 nuts 17.

[0051] The central shaft 12 is arranged from below and inside the lower part and extends upwards from the upper end of the lower part. The lower part comprises a hollow cylindrical housing 14. A locking ring 18 may secure the vertical position of the central shaft 12 and the cylindrical housing 14. An end cap 19 closes the lower end of the cylindrical housing 14.

[0052] A horizontal flange 20 extends outwardly from the lower end of the central shaft 12 in perpendicular manner from the outer surface of the central shaft 12.

[0053] Similarly, a horizontal flange 21 extends inwardly and perpendicularly from the inner surface of the cylindrical housing 14.

[0054] A ball bearing 22, is arranged between the flanges 20, 21. Each side flange part of the ball bearing 22 is attached to each of the flanges 20, 21 on the central shaft 12 and the cylindrical housing 14, respectively, and thus provides free rotation around the vertical axis of the connection unit 11. The ball bearing 22 is dimensioned to be able to carry the entire load of the lifting frame construction 1 including the person in the apron during a lifting procedure. Tests have shown that the rotational joint must be a ball bearing 22 in order to be able to carry the load and to provide low enough friction to allow for top and bottom parts to rotate freely in relation to each other.

[0055] A mounting shaft 24 and a portion of the frame part 5 are connected to the connection unit 11. The connection unit 11 comprises an upper part portion 12, 13 and a lower part 14 of the connection unit 11. The lifting frame part 5 is attached to the lower frame part 5 of the lifting frame construction 1 by being connected to the mounting shaft 24. The mounting shaft 24 comprises a longitudinal groove 31 in which the cord 27 is mounted. Thus, the cord 27 is mounted at and introduced into the upper portion of the connection unit 11, extends axially down through the connection unit 11, more detailed shown in fig. 3a , and then further in the longitudinal groove 31 to the electrical actuator 7 (not shown in figs. 2-4).

[0056] Fig. 3a is a cross section of the connection unit 11 and the mounting shaft 24 for mounting of a portion of the frame part 5, and shows in greater details these parts of the lifting arrangement. Thus, the connection unit 11 comprises a central vertical shaft 12. The central vertical shaft 12 may comprise a radial bore 29 and a central, vertical bore 30 for insertion of the electrical cord 27. At its lower end the central vertical shaft 12 comprises a horizontally outwardly extending annular bearing surface 20 or flange. The cylindrical housing 14 comprises an upper inwardly directed horizontal annular bearing surface 21 or flange to cooperate with the bearing surface 20 of the central shaft 12. Between the annular bearing surfaces 20, 21 a ball bearing 22 is provided to assure free rotation of cylindrical housing 14, in relation to the central shaft 12. The cylindrical housing 14 further comprises holes 23 in its side walls for mounting of the mounting shaft 24. The mounting shaft 24 is intended for the mounting of the lifting frame construction 1. Slide bear-

ings 25 are shown to be mounted in the holes 23 to allow rotation of the lifting frame construction 1.

[0057] In fig. 4 is shown an exploded view of the connection unit 11 and a portion of the frame part 5.

[0058] The cylindrical housing 14 comprises a through-going bore 23. The through-going bore 23 is provided perpendicularly to the longitudinal (vertical) axis of the lower housing part, i.e. horizontally when the connection unit 11 is seen in suspension vertically under a hoist. Since the cylindrical housing 14 is hollow, the through going bore 23 is preferably made of two diametrically opposed holes 23.

[0059] A mounting shaft 24 is mounted in said through-going bore 23 in rotatable manner. The mounting shaft 24 is longer than the diameter of the connection unit 11 and thus extends through the connection unit 11 and thus horizontally outwards from the connection unit housing (when seen in suspension under a hoist).

[0060] The mounting shaft 24 is provided for mounting the lifting frame construction 1 to the connection unit 11. The mounting shaft 24 is rotatable about its longitudinal axis.

[0061] In order to allow the mounting shaft 24 to rotate freely in the connection unit 11, the mounting shaft 24 may be arranged in said bore 23 in one or two linings or slide bearings 25. The linings or slide bearings 25 are preferably made of low friction resin material as discussed above, in particular low friction slide bearings.

[0062] An adjustment screw 26 may engage a threaded bore 26a in the mounting shaft 24. This adjustment screw 26 restricts the free rotation of the mounting shaft 24 to at least one of the sides and thus avoid that the mounting shaft 24 can be rotated more than once around its own axis when the adjustment screw 26 is engaged in the circumferential groove.

[0063] The restriction of the rotation of the mounting shaft 24 may e.g. be up to $\pm$ 90 degrees in relation to a vertical plane, or preferably up to $\pm$ 75 degrees or more preferred or preferably up to $\pm$ 60 degrees.

[0064] The mounting shaft 24 is for mounting of the lifting frame construction 1 to the hoist strap 4 via the connection unit 11. Lifting frames 1 of hoists are usually made of hollow pipes, e.g. steel or aluminium pipes. Thus, the lifting frame part 5 is easily mounted on the connection unit 11 by inserting the mounting shaft 24 into the void of the pipes 5. The lifting frame may then be secured to the mounting shaft by conventional attachment means, e.g. screws or rivets arranged in bores through the lifting frame pipes and corresponding bores through the mounting shaft. If screws/bolts are used, the bores in at least the mounting shaft are preferably threaded. Optionally, the corresponding bores in the lifting frame construction are threaded to engage with the screw. Alternatively, the screws may be secured by nuts (not shown).

[0065] Further, a cord connection 27 for supplying electricity and/or control signals to the electrical actuator 7 is attached to the connection unit 11, in particular through the top cap 13.

[0066] When the lifting frame construction 1 comprises an electrical actuator 7, the electrical actuator 7 is at its one end mounted to one of the frame parts 5 and at its other end to the other frame part 6. The electrical actuator 7 thus can change the position of the at least two frame parts 5, 6 relative to each other.

[0067] By arranging the cords 27 to pass through the connection unit 11 and into the lifting frame construction 1, there is no risk that the lifting frame construction 1 becomes entangled in the electrical cords 27 for the electrical actuator 7, e.g. during a lifting procedure. Similarly the risk of crushing the electrical cords 27 between moving parts of the lifting frame construction 1 is elegantly eliminated.

[0068] The connection unit 11 thus preferably also comprises one or more electrical connections 27 that are arranged to pass through the housing and the mounting shaft 24. Hereby the electrical cords 27 are completely removed from the exterior surface of the lifting frame construction 1. Thus, the electrical cord(s) 27 enters the connection unit 11 at the upper end, e.g. through the top cap 13 and into an interior space 28 of the central vertical shaft 12 of the connection unit 11. The central vertical shaft 12 may comprise a radial 29 and a central, vertical bore 28 for insertion of the electrical cord(s) 27.

[0069] In order to ensure that the electrical cords 27 do not twist when the parts of the connection unit 11 rotate in relation to each other, the connection unit 11 preferably comprises a rotatable electrical connector 30 with two parts that rotate with the upper and the lower part of the housing, respectively, to which parts a first and a second part of the electrical cord are attached. This type of sliding contact 30 is sometimes called a slip ring connection 30. This eliminates the risk of the cords 27 being twisted and potentially torn.

[0070] One part of the slip ring connector 30 is connected to the vertical central shaft 12, e.g. the flange 20 thereof. Another part can rotate freely in relation to the attached part of the slip ring connector 30. Thus, when the cylindrical housing 14 is rotated in relation to the vertical central shaft, the slip ring connector 30 ensures that the electrical cords 27 are not twisted inside the connection unit 11.

[0071] The electrical cord(s) 27 further extends into the interior of the lifting frame construction 1, i.e. inside the pipes. This may be accomplished by providing a longitudinal groove 31 in the mounting shaft 24 for mounting of the one or more electrical cords 27. The longitudinal groove 31 extends in axial direction from near the middle of the mounting shaft and towards at least one of the ends of the mounting shafts, preferably in a straight or slightly helical manner to provide room for the electrical cords 27 to extend interior the lifting frame construction 1.

Reference numbers

[0072]

1. Lifting frame construction
2. Hoist
3. Rail
4. Strap
5. First frame part
6. Second frame part
7. Electrical actuator
8. Link
9. Arm
10. Link
11. Connection unit
12. Central shaft, upper part
13. Top cap upper part
14. Cylindrical housing, lower part
15. Attachment means, eye
16. Screw/bolt
17. Nut
18. Locking ring
19. End cap
20. Horizontal bearing surface/flange on central shaft
21. Horizontal bearing surface/flange on cylindrical lower part
22. Ball bearing
23. Bore for mounting shaft
24. Mounting shaft for lifting frame
25. Slide bearings
26. Adjustment screw
27. Cord
28. Central, vertical bore
29. Radial bore
30. Slide ring connection
31. Longitudinal groove

Claims

1. A lifting frame for a lifting arrangement for lifting a weak or disabled person, the lifting frame comprising a connection unit (11) and a lifting frame construction (1), which is mounted on a mounting shaft (24) of the connection unit (11), said connection unit (11) comprising a housing, having connection means (15) arranged at the top end of the connection unit (11) for connecting to a hoist (2) and where said connection unit (11) comprises a housing divided in an upper part and a lower part, the upper and lower part of said housing which rotate freely in relation to each other about a longitudinal axis of the housing, and where said connection unit (11) further comprises a through-going horizontal bore (23) in the lower part of the housing, and where a mounting shaft (24) is mounted in rotatable manner about the longitudinal axis of the mounting shaft in said through-going bore (23), where said mounting shaft (24) is provided for mounting the lifting frame construction (1) to the connection unit (11), **characterized in that** the lifting frame construction (1) comprises at least two frame parts (5, 6), which are connected via links (8) allowing the two frame parts (5, 6) to be moveable in relation to each other, in particular by rotation and the lifting frame further comprising an electrical actuator (7) for changing the position of at least one frame part relative to another frame part, the actuator (7) being connected to one or more cords (27) being mounted inside the lifting frame construction (1) and the connection unit (11), and being arranged to pass through the housing and the mounting shaft (24).

2. A lifting frame according to claim 1, **characterized in that** the mounting shaft (24) is arranged in said bore (23) in one or two linings or slide bearings (25).

3. A lifting frame according to claim 1 or 2, **characterized in that** rotation of the upper and lower part in relation to each other is provided by arranging a bearing, such as a ball bearing (22) between the upper and the lower part of the housing.

4. A lifting frame according to claim 3, **characterized in that** the connection unit (11) comprises a rotatable electrical connector (30) with two parts that rotate with the upper and the lower part of the housing, respectively, to which parts a first and a second part of the electrical cord are attached

5. A lifting frame according to claim 4, **characterized in that** the shaft comprises a longitudinal groove (31) for mounting of the one or more electrical cords.

6. A lifting frame according to claim 5, **characterized in that** the lifting frame construction (1) comprises counterweights.

7. A lifting arrangement for lifting and/or moving weak or disabled persons, comprising a hoist (2) such as a hoist arranged on a moveable frame or a ceiling or wall mounted rail (3), and where said lifting arrangement further comprises a lifting frame according to any of claims 1 - 6 which connection unit (11) is attached to a cable, wire or strap (4) of the hoist (2).

8. A method for lifting and/or moving weak or disabled persons comprising arranging a lifting frame according to any of claims 1 -6 on a hoist (2), arranging a person in a lifting apron and attaching the apron to the lifting frame, and activating the hoist (2) for lifting and/or lowering the person and /or moving the person suspended under the hoist (2) while being lifted.

Patentansprüche

1. Hubgestell für eine Hubanordnung zum Heben einer schwachen oder behinderten Person, wobei das Hubgestell eine Verbindungseinheit (11) und eine

Hubgestellkonstruktion (1) umfasst, die auf einem Montageschaft (24) der Verbindungseinheit (11) montiert ist, wobei die Verbindungseinheit (11) ein Gehäuse mit einer Verbindungseinrichtung (15), die am oberen Ende der Verbindungseinheit (11) zum Verbinden mit einem Hebezeug (2) angeordnet ist, umfasst, und wobei die Verbindungseinheit (11) ein Gehäuse umfasst, das in einen oberen Teil und einen unteren Teil unterteilt ist, wobei sich der obere Teil und der untere Teil des Gehäuses frei in Bezug zueinander um eine Längsachse des Gehäuses drehen, und wobei die Verbindungseinheit (11) ferner eine durchgehende horizontale Bohrung (23) im unteren Teil des Gehäuses umfasst, und wobei ein Montageschaft (24) drehbar um die Längsachse des Montageschafts in der durchgehenden Bohrung (23) montiert ist, wobei der Montageschaft (24) zum Montieren der Hubgestellkonstruktion (1) an der Verbindungseinheit (11) bereitgestellt ist, **dadurch gekennzeichnet, dass** die Hubgestellkonstruktion (1) mindestens zwei Gestellteile (5, 6) umfasst, die über Verbindungsglieder (8) verbunden sind, welche ermöglichen, dass die beiden Gestellteile (5, 6) relativ zueinander bewegbar sind, insbesondere durch Drehung, und wobei das Hubgestell ferner ein elektrisches Betätigungselement (7) zum Ändern der Position des mindestens einen Gestellteils relativ zu einem anderen Gestellteil umfasst, wobei das Betätigungselement (7) mit einem oder mehreren Kabeln (27) verbunden ist, die innerhalb der Hubbestellkonstruktion (1) und der Verbindungseinheit (11) montiert und so angeordnet sind, dass sie durch das Gehäuse und den Montageschacht (24) hindurchgehen.

2. Hubgestell nach Anspruch 1, **dadurch gekennzeichnet, dass** der Montageschaft (24) in der Bohrung (23) in einem oder zwei Auskleidungen oder Gleitlagern (25) angeordnet ist.

3. Hubgestell nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Drehung des oberen und des unteren Teils in Bezug zueinander durch Anordnen eines Lagers, wie beispielsweise eines Kugellagers (22), zwischen dem oberen und dem unteren Teil des Gehäuses bereitgestellt ist.

4. Hubgestell nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Verbindungseinheit (11) einen drehbaren elektrischen Verbinder (30) mit zwei Teilen umfasst, die sich mit dem oberen bzw. unteren Teil des Gehäuses drehen, wobei an diesen Teilen ein erster und ein zweiter Teil des elektrischen Kabels befestigt sind.

5. Hubgestell nach Anspruch 4, **dadurch gekennzeichnet, dass** der Schaft eine Längsnut (31) zum Montieren des einen oder der mehreren elektrischen Kabel umfasst.

6. Hubgestell nach Anspruch 5, **dadurch gekennzeichnet, dass** die Hubgestellkonstruktion (1) Gegengewichte umfasst.

7. Hubanordnung zum Heben und/oder Bewegen von schwachen oder behinderten Personen, umfassend ein Hebezeug (2), wie etwa ein Hebezeug, das an einem beweglichen Rahmen oder einer an der Decke oder an der Wand befestigten Schiene (3) angeordnet ist, und wobei die Hubanordnung ferner ein Hubgestell nach einem der Ansprüche 1-6 umfasst, wobei die Verbindungseinheit (11) an einer Leitung, einem Draht oder Band (4) des Hebezeugs (2) befestigt ist.

8. Verfahren zum Heben und/oder Bewegen von schwachen oder behinderten Personen, umfassend Anordnen eines Hebegestells nach einem der Ansprüche 1-6 an einem Hebezeug (2), Anordnen einer Person in einer Hebeschürze und Befestigen der Schürze an dem Hebegestell, und Aktivieren des Hebezeugs (2) zum Heben und/oder Senken der Person und/oder Bewegen der unter dem Hebezeug (2) hängenden Person während des Anhebens.

Revendications

1. Cadre de levage pour un agencement de levage permettant de lever une personne affaiblie ou handicapée, le cadre de levage comprenant une unité de raccordement (11) et une construction de cadre de levage (1), qui est montée sur une tige de montage (24) de l'unité de raccordement (11), ladite unité de raccordement (11) comprenant un logement, ayant des moyens de raccordement (15) agencés à l'extrémité haute de l'unité de raccordement (11) pour un raccordement à un treuil (2) et où ladite unité de raccordement (11) comprend un logement divisé en une partie supérieure et une partie inférieure, les parties supérieure et inférieure dudit logement qui tournent librement l'une par rapport à l'autre autour d'un axe longitudinal du logement, et où ladite unité de raccordement (11) comprend en outre un alésage horizontal traversant (23) dans la partie inférieure du logement, et où une tige de montage (24) est montée de manière rotative autour de l'axe longitudinal de la tige de montage dans ledit alésage traversant (23), où ladite tige de montage (24) est prévue pour monter la construction de cadre de levage (1) sur l'unité de raccordement (11), **caractérisé en ce que** la construction de cadre de levage (1) comprend au moins deux parties de cadre (5, 6), qui sont raccordées via des articulations (8) permettant aux deux parties de cadre (5, 6) d'être mobiles l'une par rapport à l'autre, en particulier par une rotation et le ca-

dre de levage comprenant en outre un actionneur électrique (7) pour changer la position d'au moins une partie de cadre par rapport à une autre partie de cadre, l'actionneur (7) étant raccordé à un ou plusieurs cordons (27), qui sont montés à l'intérieur de la construction de cadre de levage (1) et de l'unité de raccordement (11), et étant agencé pour traverser le logement et la tige de montage (24).

2. Cadre de levage selon la revendication 1, **caractérisé en ce que** la tige de montage (24) est agencée dans ledit alésage (23) dans un ou deux revêtements ou paliers lisses (25).

3. Cadre de levage selon la revendication 1 ou 2, **caractérisé en ce qu'**une rotation des parties supérieure et inférieure l'une par rapport à l'autre est fournie par l'agencement d'un palier, tel qu'un palier à billes (22) entre les parties supérieure et inférieure du logement.

4. Cadre de levage selon la revendication 3, **caractérisé en ce que** l'unité de raccordement (11) comprend un connecteur électrique rotatif (30) avec deux parties qui tournent avec les parties supérieure et inférieure du logement, respectivement, parties auxquelles sont fixées une première et une seconde partie du cordon électrique.

5. Cadre de levage selon la revendication 4, **caractérisé en ce que** la tige comprend une rainure longitudinale (31) permettant de monter les un ou plusieurs cordons électriques.

6. Cadre de levage selon la revendication 5, **caractérisé en ce que** la construction de cadre de levage (1) comprend des contrepoids.

7. Agencement de levage permettant de lever et/ou déplacer des personnes affaiblies ou handicapées, comprenant un treuil (2) tel qu'un treuil agencé sur un cadre mobile ou un rail monté au plafond ou au mur (3), et où ledit agencement de levage comprend en outre un cadre de levage selon l'une quelconque des revendications 1 à 6, laquelle unité de raccordement (11) est fixée à un câble, un fil ou une sangle (4) du treuil (2).

8. Procédé de levage et/ou de déplacement de personnes affaiblies ou handicapées comprenant l'agencement d'un cadre de levage selon l'une quelconque des revendications 1 à 6 sur un treuil (2), l'agencement d'une personne dans un tablier de levage et la fixation du tablier sur le cadre de levage, et l'activation du treuil (2) permettant de lever et/ou descendre la personne et/ou de déplacer la personne suspendue sous le treuil (2) pendant qu'elle est levée.

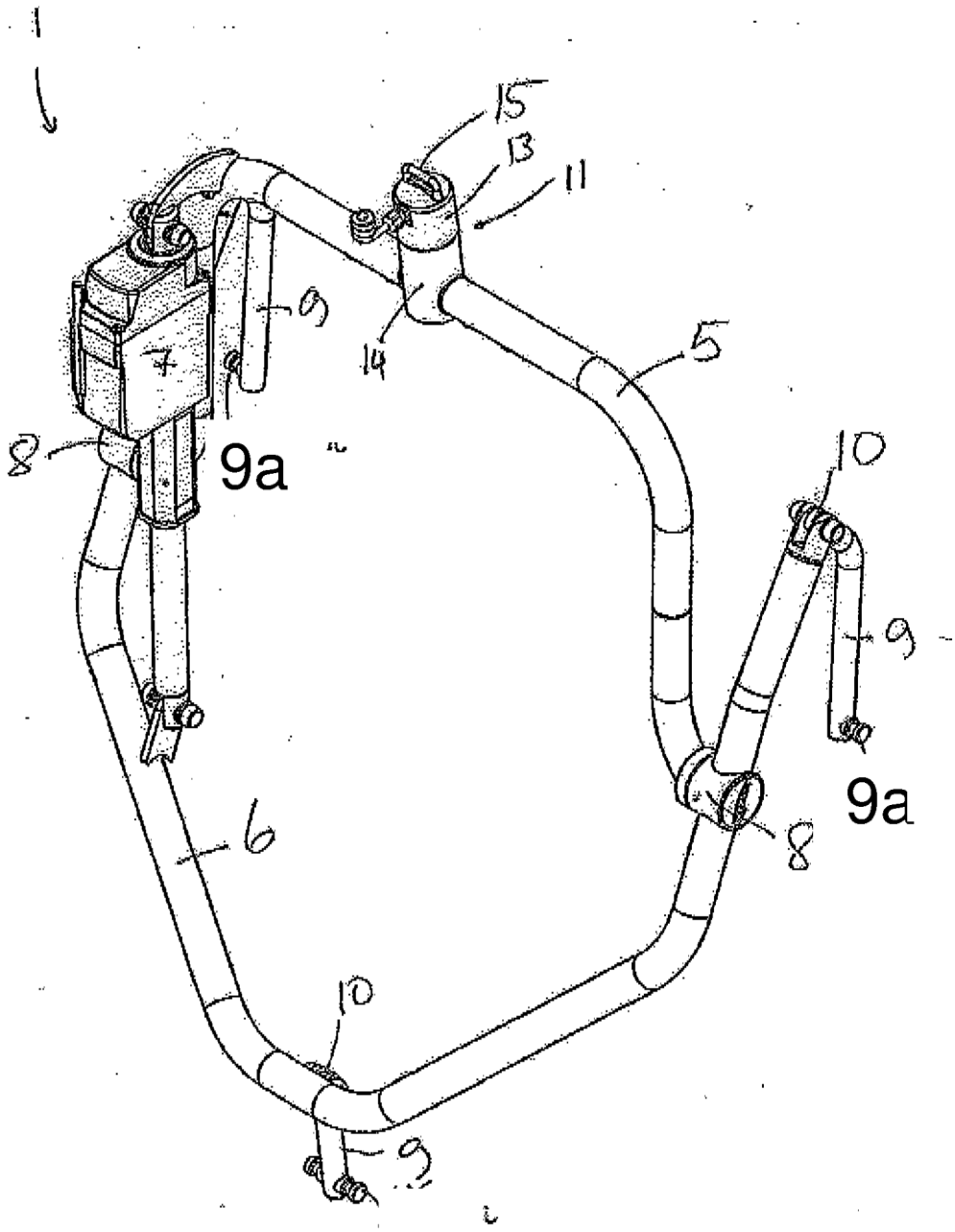

Fig. 1

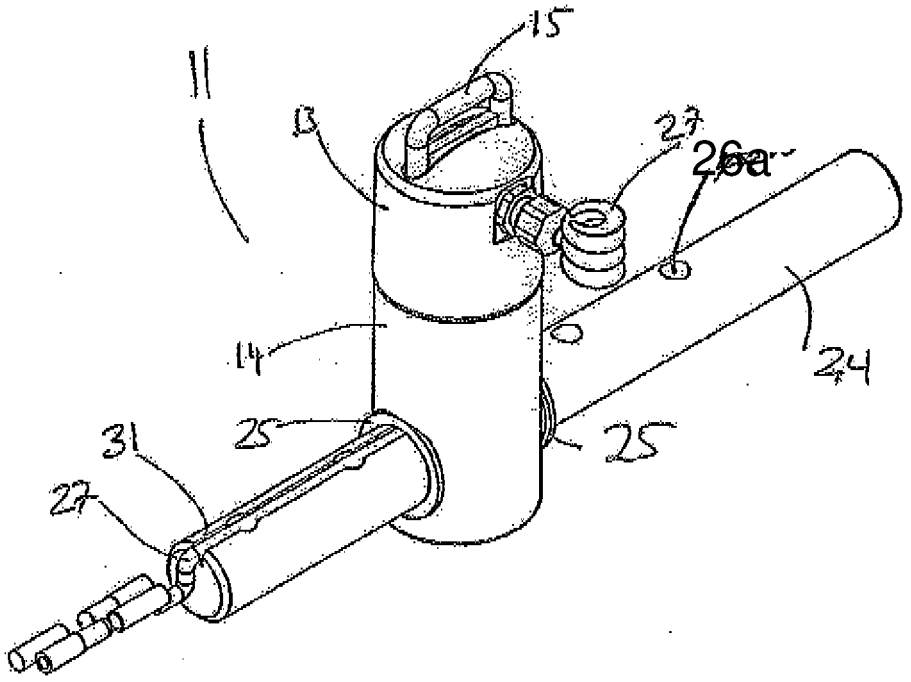

Fig. 2

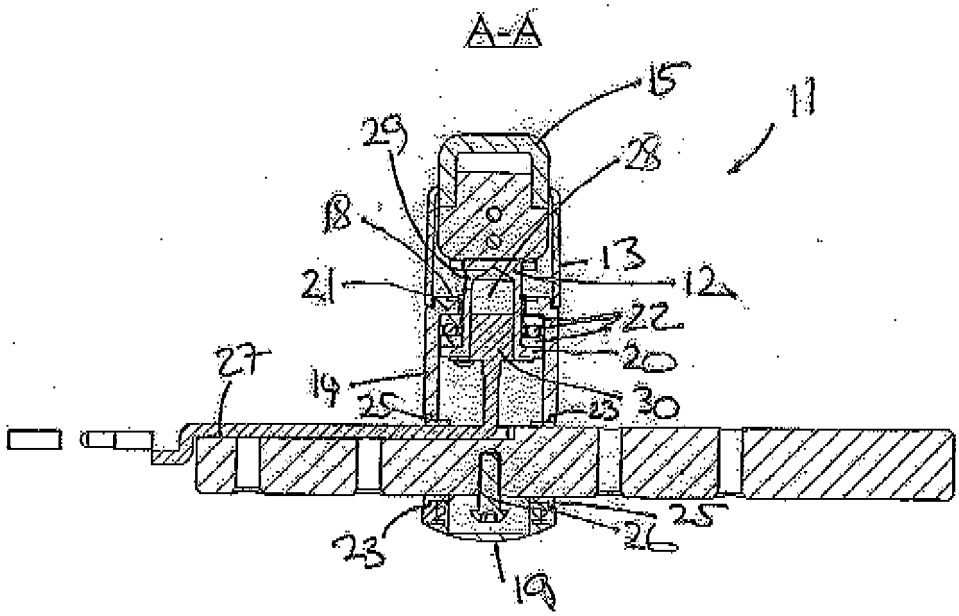
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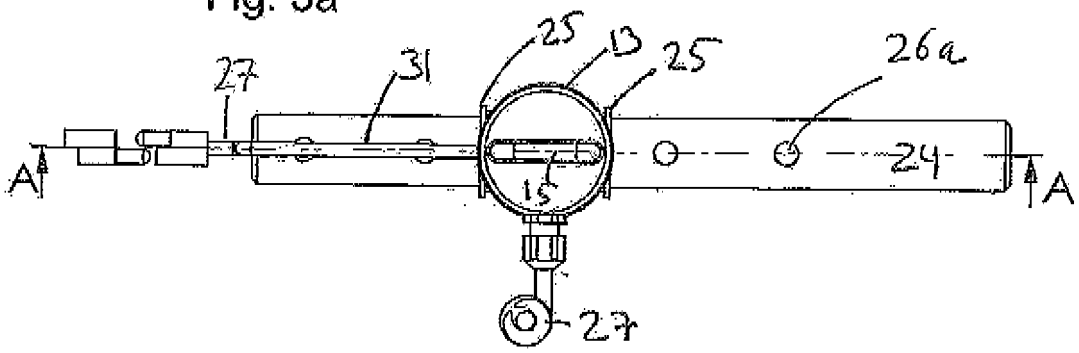
Fig. 3a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24
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27

Fig. 3b

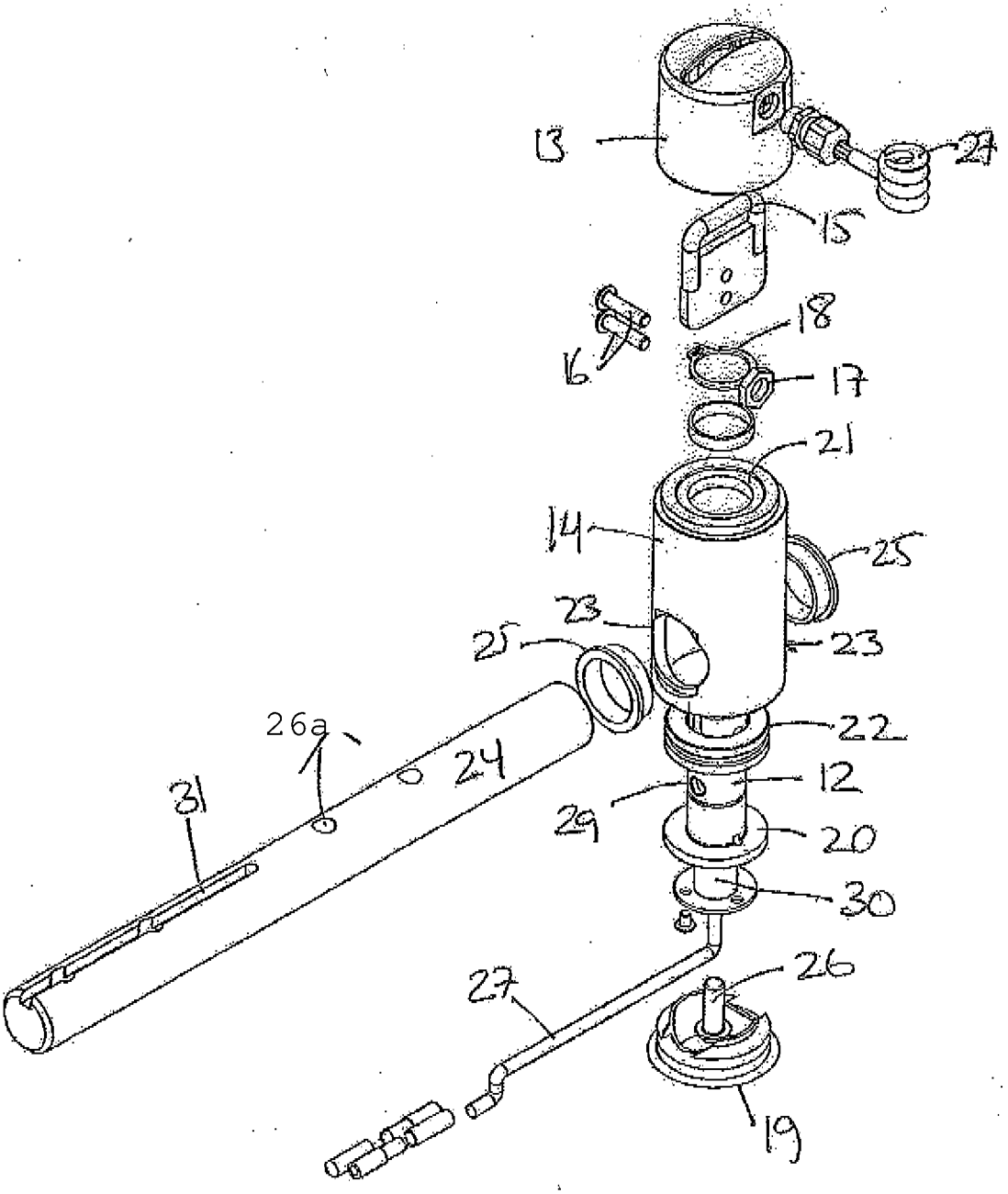

Fig. 4

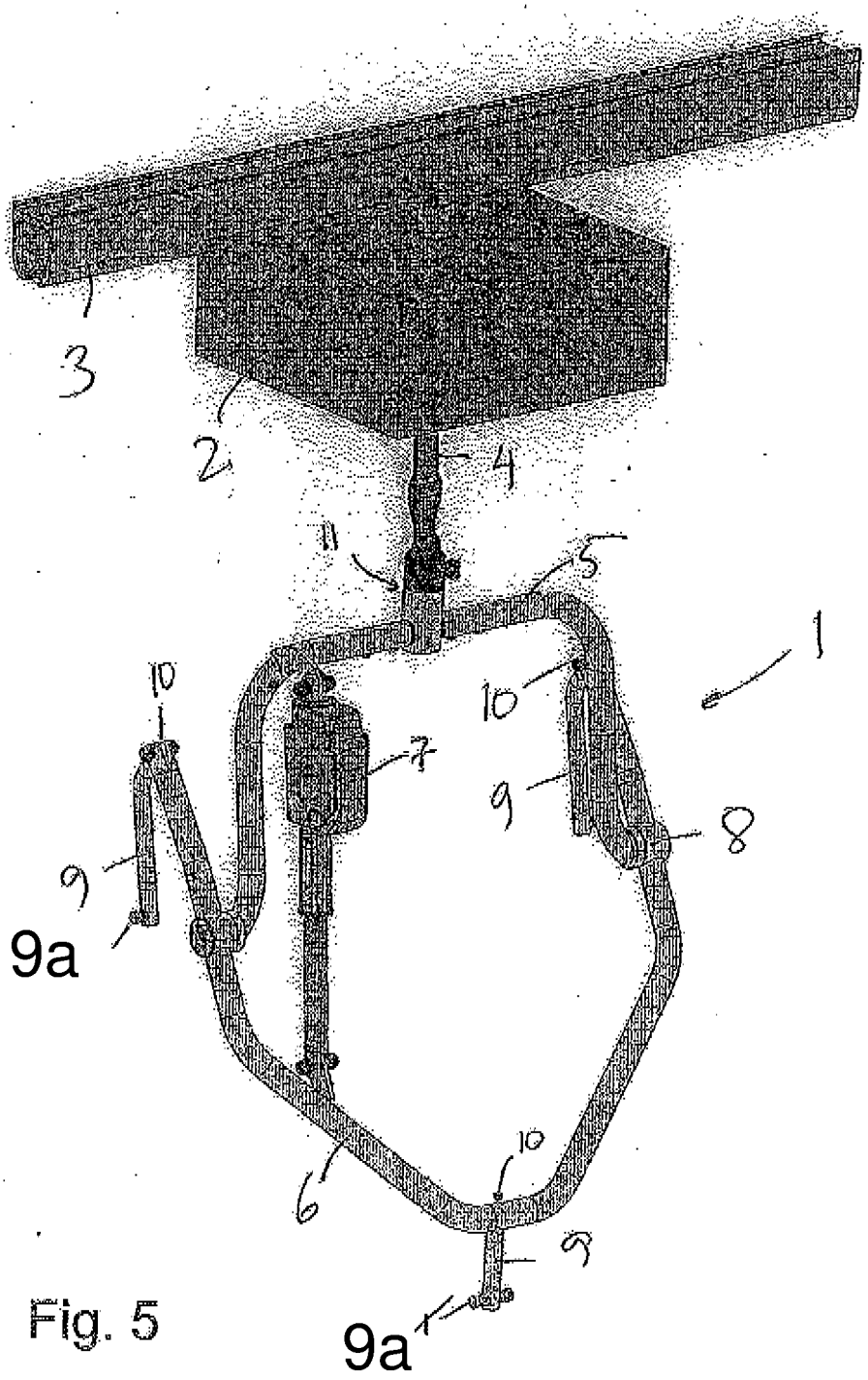

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- DE 29503098 U1 **[0008]**