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(54) **A LIFTING AND TRANSPORTING DEVICE FOR DISABLED PERSONS**

HEBE- UND BEFÖRDERUNGSVORRICHTUNG FÜR KÖPERBEHINDERTE PERSONEN

DISPOSITIF DE LEVAGE ET DE TRANSPORT POUR PERSONNES HANDICAPEES

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(56) References cited:
EP-A- 0 617 942
DE-A- 19 647 498
US-A- 4 255 823
US-A- 4 947 497
US-A- 5 644 805

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a lifting and transporting device for disabled persons. One aspect of the invention relates to a device which is build up as a module system, wherein a plurality of different assisting members may be mounted. For example a plurality of different assisting members may be mounted at a time to one single base construction in order to increase the mobility of a disabled person with only one basic transporting device.

BACKGROUND OF THE INVENTION

[0002] It is known that disabled persons have difficulties in raising, sitting, visiting the lavatory, etc. Therefore, they often need a plurality of helping devices in their homes, e.g., one for helping them in raising, a second one for helping them in walking and a third one for helping them when visiting the lavatory etc., so as to be able to live a reasonably normal human life. Transporting devices for disabled persons are often developed to be fitted to an institutional environment which means that they often are relatively large and heavy, and it is presumed that a second person is needed in order to control the devices.

[0003] Different kind of helping devices for disabled persons are known.

EP 0 617 942 A2 discloses a lifting and transporting device for transporting a person from a bed. The device comprises a substantially U-shaped base frame which comprises rollers for rolling across the floor. The base frame comprises a vertically mounted post for lifting the seat in relation to the base frame. The seat is rotationally pivotally mounted to the post, so as to swivel the seat around a vertical axis and thereby move the centre of gravity of the person from a lifting position to a transporting position.

[0004] US 4,432,359 discloses a transporting and lifting device which comprises a wheeled chassis and a vertical column. The column comprises a handle for manually lifting three supporting surfaces that supports a sitting person. The device has a H-shaped base frame which comprises wheels for rolling across the floor.

[0005] WO 87/01583 discloses a wheel chair that comprises a U-shaped base frame and a post. Three supporting plates for supporting a sitting person are mounted on the top of the post, so that the post may lift or lower the supporting plates in relation to the base frame by use of motors. Furthermore, the supporting plates comprise conveyor belts for loading or unloading the person from the chair to e.g., the lavatory.

[0006] DE 196 47 498 describes a device for assisting a person in raising from a sitting position to a standing position and comprising a base frame onto which an upright is mounted. The upright comprises lifting means and a back supporting member which is adapted to be positioned around the back of the person. The person is supported by a foot support and raised by lifting the back supporting member.

[0007] US 4,947,497 describes an apparatus for lifting patients and comprising a U-shaped moving base, and an elevator column mounted to the moving base. The column comprises holes for receiving lateral bars each of which being suitable for receiving horizontal lifting arms. Support means for supporting the person are mounted on the arms.

[0008] NL 9 301 145 discloses an apparatus for assisting a person in raising from a sitting position to a standing position and comprising a rotatable lifting rod, at the free end of which a transversely extending assisting member is provided. Knee supports for the knees of the disabled person are provided.

[0009] WO 96/11658 discloses a posture change system and posture change method. The document describes a method for lifting a person from a sitting to a standing position, the method comprising rotating the persons torso around a pivot point while the person is supported by a chest pad.

[0010] US 4,255,823 discloses in Fig. 9 and the corresponding part of the description a lifting and/or transporting device for disabled persons. This known device comprises a base member and an upright extending upwardly from the base member. A cantilever arm extending transversely from the upright has at its free end a vertical pivot mounting a supporting member pivotable in a horizontal plane. The cantilever arm may be raised and lowered by lifting means arranged in the upright. If a seat is fixed to the mounting member the seat and a disabled person sitting therein may be moved along an arc of a circle in relation to the base member, while the weight of the person has to be transferred to the cantilever arm via the vertical pivot.

SUMMARY OF THE INVENTION

[0011] An object of the present invention is to provide one or more devices and/or methods which enable disabled persons to be self-helped and live normal lives in their private homes despite of severe handicaps or diseases. A further object of the present invention is to provide means for assisting disabled persons, the means being designed in such a way that they may be controlled by the disabled person himself. A still further object of the invention is to provide devices which can easily be moved around inside the private home of a disabled person.

[0012] The present invention provides a lifting and/or transporting device for disabled persons, said device comprising

a base member, which defines an inner area, a substantially horizontal plane an a geometrical centre axis extending perpendicular to said plane, and

an upright extending from the base member, the upright

comprising

- mounting means, which are adapted to receive one or more assisting members for assisting a disabled person, and
- lifting means for lifting or lowering the assisting member, which includes a seat, and which is rotationally mounted around an axis of rotation and carried by a supporting arm, which is mounted on and extends transversely from the upright in a direction towards the inner area of the base member, and the device according to the invention is

characterised in that the seat is mounted on the supporting arm by means of a bearing, on which the seat lies which comprises
a ring-shaped member, the centre of which defines said axis of rotation, and

bearing members, which are displaceable in relation to and along the ring-shaped member, the bearing members and the ring-shaped member constituting a guide for the rotational movement of the seat in relation to the ring-shaped member, the linear distance between said axis of rotation of the seat and the geometrical centre axis of the base member being at most 20 cm, when the seat is rotated around the axis of rotation within an angular range of at least 45°.

[0013] The lifting and transporting device may comprise one or more assisting members at a time, and thereby provide the disabled persons with one single lifting and transporting device for all needs or at least for a plurality of different needs. The lifting and transporting device for assisting disabled persons may be constructed as a module system having a base frame and an upright onto which a plurality of assisting members may be mounted, the upright comprising mounting means which are adapted to receive one or more assisting members for carrying or otherwise assisting a disabled person. The upright further comprises lifting means for lifting or lowering the assisting members in relation to the base frame.

[0014] In the present application, the term "lifting means" cover any means suitable for and/or capable of activating a lifting and/or lowering movement of any device or a person. The lifting means may comprise manually driven means, electrically driven means and/or hydraulically driven means in combination with one or more chains, telescopic cylinders, belts, wires and/or suspension bands.

[0015] According to the invention the lifting and/or transporting device for disabled persons comprises a base member and an upright extending from the base member and comprising a plurality of mounting means which are adapted to receive one or more assisting members for carrying or otherwise assisting a disabled person. The mounting means may be positioned at different positions along the height of the upright so as to allow one or more assisting members to be mounted at different positions along the height of the upright, and lifting means for lifting and lowering the upright in relation to the base member, and wherein the upright is displaceable along the base frame.

[0016] The base member may comprise a track, and in that case. the track may be integrated in a floor. The base frame may be stationary mounted, e.g., to a floor, or the base frame may comprise wheels and/or rollers for rolling and/or driving the device along a floor or ground surface.

[0017] The assisting members may comprise all kinds of devices or parts for assisting and/or carrying a disabled person. Thus, an assisting member may comprise a seat, optionally provided with a lavatory hole, one or more handgrips, a stretcher, a table surface, means for supporting specific body parts of the disabled person, such as, e.g., the thighs, the calves, the knees, the back, the buttocks, the torso, the arms, the neck and/or head or the feet. An assisting member alternatively may comprise straps for hoisting devices optionally comprised in the device.

[0018] An advantage of the above-mentioned aspect of the invention is that the upright is displaceably mounted to the base frame or track which provides improved flexibility of the device in relation to prior art devices. Thus, the device to a large extent is independent of the layout and design of, e.g., a bathroom, toilet, kitchen, doors etc. of a private home.

[0019] The mounting means which are adapted to receive one or more assisting members at a time allows mounting of a plurality of different assisting members on the upright, using only one single transporting device. The mounting means may comprise a sheet or plate which extends along the height of the upright and which is provided with mounting holes or other means for receiving the assisting members. The upright further comprises lifting means for lifting or lowering the assisting members. The lifting means may comprise an electrical power driven chain for lifting or lowering the assisting members or any other suitable means for lifting.

[0020] The base frame may be U-shaped or H-shaped and supported by a plurality of wheels or rollers for rolling the device over or along a ground or floor surface.

[0021] In the present application, the terms "wheels" or "rollers" cover any kind of driving or rolling means. All or some of the wheels or rollers of a device or frame may be driven by driving means, which may, e.g., comprise electrical means. Preferably, the driving means are adapted to drive the device in all and any directions. For some applications of the device, some or all of the driving wheels may be of the type disclosed in WO 99/01298, the disclosure of which document is hereby made part of the present application. For ensuring that the device does not roll when the person supported by the device is not ready for rolling, the wheels may further comprise braking means for stopping movement of the wheels or rollers. The driving and braking means may

be electronically controllable, if the device further comprises user control means for controlling braking and/or driving of the wheels.

[0022] As an alternative, the U-shaped base frame may be adapted to be stationary mounted in or to a floor or it may be adapted to be rotationally and/or displaceable mounted in relation to the floor.

[0023] The lifting and transporting device has the particular advantage that the upright comprises lifting means for lifting or lowering a plurality of assisting members at a time. Thereby, two assisting members for, e. g., the torso and the back, respectively, of a disabled person may be lifted at a time. Thus, the possibility is provided that the person is being lifted, so that he/she makes a normal human movement, which is a major advantage over the type of prior art devices, which are adapted to pull a belt which is wound around the disabled person's torso.

[0024] According to the present invention, the upright may be displaceable along the base frame or track, the base frame or track being mounted on or integrated in a floor or they may be mounted on a turntable which is mounted on or integrated in a floor.

[0025] Furthermore, the base frame may be U-shaped or H-shaped and have a length being larger than the width.

[0026] The lifting and/or transporting device may have an upright which comprises mounting means which are adapted to receive at least a first platform, and lifting means which are adapted to lift and lower the first platform. The device further comprises a second platform which is supported along at least a first and a second supporting line, one of which supporting lines is provided between the second platform and a floor support and another one of which is provided between the second platform and the first platform. The first supporting line provides a pivot for the pivotal movement of the second platform around said pivot, and the support provided by the second supporting line allows rotative movement between the second platform and the first platform or between the second platform and a floor support, so that when the first platform is lifted or lowered, the second platform pivots around the pivot and simultaneously slides along the first platform or along the floor support.

[0027] According to this aspect of the present invention the device provides the possibility that a person who is unable to overcome, e.g. a staircase or another level change may use the platforms. Thus, the disabled person may, e.g., place his/her wheelchair on the first platform, lift the platforms by activating the lifting means, and finally enter a floor on a higher level by rolling the chair over the second platform to the floor.

[0028] As an alternative, the pivot may be placed between the floor support and the second platform, and the slideable support may be placed between the first and second platform. The first and/or second platform may comprise banisters, which may be releasable mounted to the first and/or second platform.

[0029] In another embodiment of this aspect of the present invention, the assisting member may comprise only one lifting platform, which is horizontally mounted to the upright for lifting or lowering objects from one level to another.

[0030] The said axis of rotation may extend through a central part of the seat substantially perpendicularly to the seating surface, and preferabty, the rotation axis is substantially coincident with the longitudinal axis of the torso of a person sitting upright in the seat.

[0031] The linear distance between the axis of rotation and the geometrical centre axis may be at most 20 cm, such as at most 18 cm, such as at most 16 cm, such as at most 14 cm, such as at most 12 cm or even lower, such as at most 10 cm, such as at most 8 cm, such as at most 6 cm, or such as at most 5 cm, such as at most 4 cm, or even lower, such as at most 3 cm, such as at most 2 cm or at most 1.5 cm, such as at most 1 cm, at most 0.8 cm, at most 0.6 cm, at most 0.5 cm, at most 0.4 cm, 0.3 cm, 0.2 cm, such as 0.1 cm, such as 0.8 mm, such as 0.6 mm, such as 0.4 mm, such as at most 0.3 or at most 0.2 mm, such as at most 0.1 mm, or even closer to 0 mm or even 0 mm.

[0032] Preferably, the seat may be rotationally mounted to a supporting arm and be detachably mounted to the upright. Thus, when the seat is oriented such that the disabled person sitting on the seat faces a first direction, the transporting device has a first width which is approximately equal to the width of the base frame, and when the seat is oriented such that the disabled person sitting on the seat faces a second direction, the transporting device has a second width which is approximately equal to the length of the base frame. Thus, the transporting device may be designed so that it may pass through a standard door having a width of approximately 60 cm, while the device may be sufficiently long in order to ensure stability of the device. In comparison to some prior art devices which have dimensions in all directions which makes it impossible to pass such devices through standard doors.

[0033] The device may further comprise a locking device for locking the seat in relation to the supporting arm. Preferably, the locking device comprises one or more spring-biased pawls which are adapted to engage corresponding grooves provided in furnishings, and the furnishings may be mounted to the seat, and wherein the locking device may be mounted to the ring-shaped member, or vice versa.

[0034] The pawls may be retracted from the grooves of the furnishings by pulling a release handle, so as to release the seat and allow rotation thereof.

[0035] The seat mentioned above may further comprise a lavatory hole, so as to make it possible for a person to visit the lavatory without leaving the seat, and only rolling the transporting device to the toilet bowl and placing the seat over the lavatory bowl.

[0036] Preferably, the lavatory hole is arranged within the inner periphery of the ring-shaped member when

seen in plane projection. The lavatory hole may be covered by a sheet, which may be pivotally mounted to the seat either under or above the seat, so that it is removable between a cover position and a non-cover position.

[0037] A still further assisting member, which is adapted to be mounted to the upright, may be provided in order to pull the disabled person towards the upright and simultaneously pull the disabled person in an upward direction, so as to assist the disabled person in raising from a sitting to a standing position and/or in getting from a standing to a sitting position. This assisting member may in a preferred embodiment comprise a wire which is wound around a power driven reel connected to or integrated in the upright, the pulling movement towards the upright being provided by winding the wire around the reel, and the upward or downward movement is provided by the vertical movement of the upright. The wires may be of nylon wires, fibre reinforced wires, cables, suspension bands, etc.

[0038] This assisting member may be mounted to the upright together with a further assisting member, e.g., a plate that is adapted to assist the legs and feet of the person. An advantage of the mounting of these assisting members at the same time is that they provide a normal human movement of the disabled person when raising and sitting instead of the person being pulled by a torso belt only. The plate may provide a safe support for the feet of a disabled person and may ensure that the person does not slide on the floor when raising or sitting.

[0039] A still further assisting member mounted to the upright may comprise one or more handgrips, so as to assist the disabled person in raising from a sitting to a standing position and/or in getting from a standing to a sitting position when lifting or lowering the upright, respectively.

[0040] A further assisting member mounted to the upright may comprise a seat which is mounted on an arm, which is pivotally mounted around a substantially horizontal axis that may be mounted to the upright, whereby the seat may be swung between a supporting position and a non-supporting position. This assisting member allows the person to put on or take off a pair of trousers or a skirt, e.g., when visiting the lavatory. This is due to the fact that the seat can be displaced from the supporting position between the legs to the non-supporting position which may be on one side of the person. The arm may be spring biased, and furthermore, the arm may be either manually, electrical or hydraulic driven. The arm may further comprise one or more abdomen supporting members for supporting the abdomen of the person.

[0041] A still further assisting member may comprise a table sheet or plate mounted to the upright in mounting means, whereby the table sheet may be lowered or lifted by lifting means.

[0042] Another assisting member comprises at least two supporting plates which are pivotally interconnected along one of there respective edges, so that they in an aligned position define a supporting surface for a lying person, and so that they in a non-aligned position define supporting surfaces for a sitting person. This assisting member may comprise three supporting plates, wherein an edge of a first supporting plate is pivotally connected to a first edge of a second supporting plate, and an edge of a third supporting plate being pivotally connected to a second edge of the second supporting plate, the second edge of the second supporting plate being opposite to the first edge. Preferably, the assisting member may comprise locking means for interlocking the two or three supporting plates in different mutual positions. The pivotal movement of the supporting plates may be driven by manual means, such as a wire and a hand crank or they may be driven by power driven means. It is a possibility that at least one of the supporting plates is provided with a driving belt for loading or unloading a lying person to or from the supporting surface defined by the supporting plates. Thereby, the person is being cared in a gently way.

[0043] An assisting member is pivotally mounted to the uprigh and may comprise a supporting plate for abutting the chest of a disabled person, so as to assist the disabled person when raising from a sitting to a standing position and/or when getting from a standing to a sitting position. An advantage of this design is that the pivotal mounting of the supporting plate provides the possibility that the disabled person leans forward towards the supporting plate which abuts the torso or parts of the torso while simultaneously being lifted, so that the movement of the torso of the person comprises at least two movements, a linear lifting/lowering movement and a rotational bending forward/leaning backward movement. Thereby, a normal human movement is allowed for. Furthermore, the person may lean towards the supporting plate when taking off or putting on his/her trousers or skirt while simultaneously being supported by the assisting member.

[0044] All of the above-mentioned assisting members may be mounted to the upright one, two, three, four, five or all at a time and in any combination, and they may be mounted to an upright that has any of the lifting means that are described above. The upright may be fixed or displaceable mounted to a base frame which may be substantially U-shaped or circular or rectangular and comprises wheels or rollers that are manually or power driven. It should be understood that any combination of frame configurations, lifting means, assisting members, wheels or rollers and other features mentioned above are possible within the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0045]

Fig. 1 shows a lifting and transporting device according to an aspect of the invention,

Figs. 2a-e show an assisting member mounted to

the upright in a device according to the invention,

Figs. 3a and 3b show a locking device for locking the rotation of the assisting member of Figs. 2a-e,

Figs. 3c and 3d show details of the assisting member of Figs. 2a-e,

Fig. 3e shows a further locking device for interlocking a first and a second part,

Fig. 4 shows a second assisting member mounted to the upright in a device according to the invention,

Figs. 5a-b show an embodiment of the invention, wherein three assisting members mounted to the upright,

Figs. 6a-b show a device having further assisting members mounted to the upright,

Fig. 7 shows a device having a table plate or sheet mounted to the upright.

Fig. 8 shows a device having an assisting member, which is adapted to support a lying person, and which is divided into three parts,

Fig. 9 shows an assisting member mounted to the upright in a device according to a further aspect of the invention, and

Fig. 10 shows a device having further assisting members mounted to the upright.

DETAILED DESCRIPTION OF THE DRAWINGS

[0046] Fig. 1 shows a first device according to the invention. The device comprises a U-shaped base frame 1 and a vertical upright 2 extending upwardly from the base frame. The upright is releasable mounted to the base frame, so that the upright may be displaced to different positions along the U-shaped base frame. The upright comprises mounting means 3 for receiving assisting members, so as to allow a plurality of assisting members to be mounted to the upright at a time. The base frame comprises wheels 4, and the upright further comprises lifting means (not shown) for lifting or lowering of the mounting means in relation to the base frame. The lifting means are controlled via the remote control 5.

[0047] Figs. 2a-e show embodiments of a device according to the invention, wherein an assisting member 30 is rotationally mounted on an arm 31, which is mounted to an upright 32. The upright 32 is mounted to a U-shaped base frame 33. The assisting member 30 comprises a seat 34 for supporting the thighs and buttocks of a person, the seat 34 being mounted around a pivot defining an axis of rotation. The seat 34 is rotationally mounted on a ring-shaped member 39. As illustrated in Figs. 3c and 3d, bearing members 39a are mounted to the underside of a frame of the seat, the bearing members 39a and the ring-shaped member 39 together defining a bearing for the rotational movement of the seat.

[0048] The assisting member further comprises a backrest 35, two armrests 36, and a footrest 37. The upright 32 comprises lifting means for lifting the assisting member. The assisting member 30 is rotationally mounted on the arm 31, so that the seat 34 may be rotated around its axis of rotation. The U-shaped base frame 33 defines an inner area 38, which has a geometrical centre axis. The seat 34 may be pivoted 90° around its axis of rotation, so that the device, with a person sitting in the seat, may pass through a relatively narrow passage, such as, e.g., a door. The seat 34 comprises a lavatory hole 41, which may be covered by the cover 40.

[0049] Figs. 3a-d shows a locking device 10 for locking the rotation of the seat of the assisting member of Figs. 2a-e. The locking device comprises a release handle 11 that is springloaded via the spring 12. The device comprises mounting means 13 for mounting it to the ring-shaped member 14 of Fig. 3b onto which the seat is rotationally mounted. By pulling the release handle, the pawl 15 may be released from the furnishing 16, and the seat may be rotated until the pawl grips the furnishing and locks the seat.

[0050] The ring-shaped member 14 is mounted on an arm 17 which is mounted to the upright by mounting means 18.

[0051] Fig. 3e shows a device for interlocking two parts 201 and 202. A first part 201 which is cylindrical has neck 203 in the form of a reduced diameter portion and a conical head 204. The second part 202 has a through-going bore 205 and a pawl 206 for engaging the reduced diameter portion 203 of the first part 201 when the first part is inserted into the bore 205. The pawl 206 is pivotally mounted around a pivot 207, around which pivot a grip 208 is mounted. The pawl 206 is biased towards the position shown in Fig. 3e due to gravity acting on the grip 208. When the first part 201 is inserted into the bore 205, the conical head 204 slides along the pawl 206 which at the same time performs a rotating movement around the pivot 207. When the conical head 204 has passed the pawl 206, the pawl snaps into engagement with the reduced diameter portion 203, and the first and second parts, 201 and 202, respectively, are interlocked. When the locking is to be released, the grip 208 is pressed in the direction of the arrow 209, whereby the pawl 206 is moved away from the reduced diameter portion 203, and the first part 201 may be retracted. The locking device may be used, e.g., for locking the armrests 36 to a frame of the seat 34, the first part 201 thereby being connected to or integrated in connecting portions 36a of the armrests 36, the second part 202 being part of the frame of the seat 34, cf. Fig. 2a.

[0052] Fig. 4 shows a further embodiment, wherein an

assisting member comprising a plate 70 is pivotally mounted to the upright 72 that comprises lifting means for lifting or lowering the plate. The plate 70 is adapted to support the chest or torso of a person and to abut the chest of the person when raising or sitting from, e.g., a bed 73. When the person leans forward, the plate pivots around a horizontal axle 71, whereby a normal human movement is made possible for the person when raising. One part of the raising movement is provided when lifting the plate 70, and another part of the movement is provided when pivoting the plate. In the standing position, the person is supported at the chest only, and consequently the person is capable of taking off or putting on e.g., the trousers, as no assisting members for supporting the buttocks or thighs are positioned between the legs. The plate further comprises hand grips 74.

[0053] Figs. 5a-b show a further embodiment of a device according to the invention, wherein three assisting members are mounted to the upright for assisting a person in raising or sitting from, e.g., a bed 55. The assisting members comprise a feet support 50, a belt 51 for supporting the back of a person, and handgrips 52. The belt 51 is fastened to the upright. When lifting the upright, the belt 51 rolls on the two rollers 53,54 and pulls the back of the person towards the upright, while the handgrips 52 simultaneously move upwards.

[0054] Figs. 6a-b show a further embodiment of a device according to the invention. Two assisting members are mounted to the upright, one member comprising handgrips 80 and arm supporting plates 81 and another one comprising a supporting seat 82 and stomach supporting plates 83. Thus, the supporting seat 82 is adapted to support the buttocks of the person when using the transporting device, and the supporting plates 83 is adapted to support the stomach so that the person does not is better supported when walking and does not overbalance.

[0055] The supporting seat 82 may be pivotally mounted on a horizontal arm mounted to the upright, so that the seat may be displaced from a horizontal supporting position to a vertical non-supporting position by swinging it downwards, whereby the person is able to take off the trousers when visiting the lavatory while still using the handgrips for raising or sitting. Further supports 83 for supporting the abdomen portion of the disabled person are provided.

[0056] Fig. 7 shows a further embodiment of a device according to the invention, wherein an assisting member comprising a table sheet 90 is mounted to the upright 91. This embodiment is adapted not only for disabled person, but for anyone who need the possibility of lifting or lowering the table sheet in dependency of the preferred working height.

[0057] Fig. 8 shows a further device, wherein an assisting member is mounted to the upright, the assisting member comprising three supporting plates 100 for supporting a lying person, and driving belts 101 for loading or unloading the person. The three supporting plates 100 are pivotally interconnected to each other along one their respective edges, so as to provide the possibility of converting the lying surface defined by the three supporting plates 100 into a seat. Each of the driving belts may be driven in sideways direction in relation to a bed on which a person is lying.

[0058] Fig. 9 shows an assisting member comprising two platforms 22,23 which are mounted to the upright 21. The first platform 22 is horizontally mounted to the upright 21 and is lifted or lowered by the lifting means (not shown) which are provided in the upright. The second platform 23 is supported at two supporting lines 24,25, a first supporting line 24 extending along the first platform and the second supporting line 25 extending along on a floor at the elevated level. The first supporting line 24 is established by a pivot, so as to provide a pivotal movement between the first and second platform 22 and 23, respectively, and the second supporting line 25 is established by the edge of the floor at the elevated level. When lifting the first platform 22 by the lifting means, the second platform 23 pivots around the first supporting line 24 and slides on the floor at the elevated level. The first platform 22 further comprises banisters 26.

[0059] Fig. 10 shows a further embodiment of the device, wherein two assisting members are mounted to the upright, the assisting members comprising handgrips 60 and a footrest 61.

Claims

1. 1. A lifting and/or transporting device for disabled persons, said device comprising

a base member (1, 33), which defines an inner area, a substantially horizontal plane an a geometrical centre axis extending perpendicular to said plane, and

an upright (2, 21, 32, 72, 91) extending from the base member, the upright comprising

- mounting means (3), which are adapted to receive one or more assisting members (22, 33, 30, 60, 61, 50-52, 70, 80-83, 90, 100) for assisting a disabled person, and
- lifting means for lifting or lowering the assisting member, which includes a seat (34), and which is rotationally mounted around an axis of rotation and carried by a supporting arm (31), which is mounted on and extends transversely from the upright in a direction towards the inner area (38) of the base member,

characterised in that the seat (34) is mounted on the supporting arm (31) bv means of a bearing, on which the seat lies and which comprises

a ring-shaped member (39), the centre of which defines said axis of rotation, and

bearing members (39a), which are displace-

able in relation to and along the ring-shaped member, the bearing members and the ring-shaped member constituting a guide for the rotational movement of the seat in relation to the ring-shaped member, the linear distance between said axis of rotation of the seat (34) and the geometrical centre axis of the base member (1, 33) being at most 20 cm, when the seat is rotated around the axis of rotation within an angular range of at least 45°.

2. A device according to claim 1, wherein the bearing members (39a) are mounted to the seat (34), and wherein the ring-shaped member (39) is mounted to the supporting arm (31).

3. A device according to claim 1 or 2, wherein a lavatory hole (41) is provided in the seat (34), the lavatory hole being arranged within the inner periphery of the ring-shaped member (39) when seen in plane projection.

4. A device according to any of claims 1-3, wherein the base member (1, 33) is U-shaped.

5. A device according to claim 4, wherein the U-shaped base member is adapted to be rotationally and/or displaceable mounted in relation to the floor.

6. A device according to claim 5, wherein the U-shaped base member is supported by a plurality of wheels or rollers.

7. A device according to claim 6, wherein the base member comprises driving means for driving the wheels or rollers.

8. A device according to any of the claims 1-7, further comprising a locking device (10) for locking the seat (34) in relation to the supporting arm (31).

9. A device according to claim 8, wherein the locking device comprises one or more spring-biased pawl (s) (15), which is/are adapted to engage corresponding grooves provided in furnishings (16).

10. A device according to claim 8 or 9, wherein the locking device (10) further comprises a release handle (11) for retracting the one or more pawl(s) (15) from the grooves of the furnishings, so as to release the seat and allow rotation thereof.

11. A device according to any of the claims 1-10, wherein the axis of rotation is substantially coincident with the longitudinal axis of the torso of a person sitting upright in the seat (34).

12. A device according to any of the claims 1-11, wherein the mounting means (3) comprise a sheet or plate, which extends along the height of the upright and is provided with mounting holes or other means for receiving the assisting members.

13. A device according to any of the claims 1-12, wherein the base member comprises a track.

14. A device according to any of the claims 1-13, wherein the base member is mounted on or integrated in a floor.

15. A device according to any of the claims 1-14, wherein the base member or track is mounted on a turntable, which is mounted on or integrated in a floor.

16. A device according to any of claims 1-15, further comprising an assisting member adapted to pull the disabled person towards the upright and simultaneously pull the disabled person in an upward direction, so as to assist the disabled person in raising from a sitting to a standing position and/or in getting from a standing to a sitting position.

17. A device according to claim 16, wherein the assisting member is connected to the upright by a wire e. g., a suspension band (51), which is wound around a power driven reel connected to or integrated in the upright, the pulling movement towards the upright being provided by winding the wire around the reel (53,54), the upward or downward movement being provided by vertical movement of the upright.

18. A device according to claim 16 or 17, further comprising a foot or leg rest for assisting the feet and/or legs of the disabled person.

19. A device according to any of the claims 1-18, wherein the assisting members comprise a further seat (82) mounted on an arm, which may be mounted on the upright so as to be pivotable around a substantially horizontal axis, whereby said seat may be swung between supporting and non-supporting positions.

20. A device according to claim 19, further comprising one or more abdomen supporting member(s) (83) mounted to the arm so as to support the abdomen of the person.

21. A device according to any of claims 1-20, wherein the assisting members comprise a table sheet (90) mounted to the upright by said mounting means so as to be lowered or lifted.

22. A device according to any of claims 1-21, wherein the assisting members comprise at least two supporting plates (140-143), which are pivotally interconnected along one of there respective edges, so

that they in an aligned position define a supporting surface for a lying person, and so that they in a non-aligned position define supporting surfaces for a sitting person.

23. A device according to claim 22, further comprising locking means for interlocking the two supporting plates in different mutual positions.

24. A device according to claim 22 or 23, further comprising power driven means for the pivotal movement of the supporting plates in relation to each other.

25. A device according to any of claims 22-24, comprising three supporting plates, an edge of a first supporting plate being pivotally connected to a first edge of a second supporting plate, and an edge of a third supporting plate being pivotally connected to a second edge of the second supporting plate, the second edge of the second supporting plate being opposite to the first edge.

26. A device according to any of claims 22-25, wherein at least one of the supporting plates is provided with a driving belt for loading or unloading a lying person to or from the supporting surface defined by the supporting plates.

Patentansprüche

1. Hebe- und/oder Beförderungseinrichtung für körperbehinderte Personen, welche folgendes umfaßt;

ein Basiselement (1, 33), weiches eine innere Fläche, eine im wesentlichen horizontale Ebene, und eine geometrische Zentralachse, die sich senkrecht zu dieser Ebene erstreckt, definiert, und
ein aufrechtes Element (2, 21, 32, 72, 91), welches sich vom Basiselement erstreckt und folgendes umfaßt

- Montagemittel (3), die zur Aufnahme von einem oder mehreren Hiffselementen (22, 33, 30, 60, 61,50-52,70,60-83,90, 100) adaptiert sind, um einer körperlich behinderten Person behilflich zu sein, und
- Hebemittel zum Heben oder Herablassen des Hilfselements, die einen Sitz (34) mit beinhalten, der drehbar um eine Rotationsachse montiert ist und von einem stützenden Arm (31) getragen wird, der am aufrechten Element montiert ist und sich vom aufrechten Element transversal In einer Richtung zur inneren Fläche (38) des Basiselaments erstreckt.

dadurch gekennzeichnet, daß der Sitz (34) auf dem stützenden Arm (31) mittels einer Lagerung, auf welcher der Sitz liegt, befestigt ist, welche folgendes umfaßt:

ein ringförmiges Element (39), dessen Mitte die Rotationsachse definiert,
und
Lagerelemente (39a), die relativ zum und entlang dem ringförmigen Element verschoben werden können, wobei die Lagerelemente und das ringförmige Element eine Führung für die Drehbewegung des Sitzes relativ zum ringförmigen Element darstellen, wobei der lineare Abstand zwischen der Rotationsachse des Sitzes (34) und der geometrischen Zentralachse des Basiselements (1, 33) höchstens 20 cm beträgt, wenn der Sitz innerhalb eines Winkelbereichs von mlndestens 45° um die Rotationsachse gedreht wird.

2. Vorrichtung gemäß Anspruch 1, wobei die Lagerelemente (39a) am Sitz (34) montiert sind, und wobei das ringförmige Element (39) am stützenden Arm (31) montiert ist.

3. Vorrichtung gemäß Anspruch 1 oder 2, wobei ein Toilettentoch (41) im Sitz (34) vorgesehen ist, wobei das Toilerienloch innerhalb des Umfangs des ringförmigen Elements (39), gesehen in der Projektion auf die Ebene, angeordnet ist.

4. Vorrichtung gemäß einem der Ansprüche 1 bis 3, wobei das Basiselement (1, 33) U-förrnig ist.

5. Vorrichtung gemäß Anspruch 4, wobei das U-förmige Basiselement so eingerichtet ist, daß es drehbar und/oder verschiebbar relativ zum Fußboden montiert werden kann.

6. Vorrichtung gemäß Anspruch 5, wobei das U-förmige Basiselement von einer Mehrzahl von Rädern oder Rollen getragen wird.

7. Vorrichtung gemäß Anspruch 6, wobei das Basiselement Antriebsmittel zum Antreiben der Räder oder Rollen aufweist.

8. Vorrichtung gemäß einem der Ansprüche 1 bis 7, zusätzlich aufweisend eine Festklemmvorrichtuog (10) zum Festklemmen des Sitzes (34) relativ zum stützenden Arm (31).

9. Vorrichtung gemäß Anspruch 8, wobei die Festklemmvorrichtung eine oder mehrere mit Fedem gespannte Klintce(n) (15) aufweist, die zum Eingreifen in entsprechende Nuten in den Beschlägen

(16) eingerichtet ist/sind.

10. Vorrichtung gemäß Anspruch 8 oder 9, wobei die Festklemmvonichtung (10) zusätzlich einen Freigabegriff (11) aufweist, um eine oder mehrere der Klinke(n) (15) aus den Nuten in den Beschlägen zurückzuziehen, um den Sitz freizugeben, so daß er gedreht werden kann.

11. Vorrichtung gemäß einem der Ansprüche 1 bis 10, wobei die Rotationsachse im wesentlichen mit der Längsachse des Körperrumpfes einer aufrecht auf dem Sitz (34) sitzenden Person zusammenfällt.

12. Vorrichtung gemäß einem der Ansprüche 1 bis 11, wobei die Montagemittel (3) ein Blech oder eine Platte umfassen, weiche(s) sich entlang der Vertikalachse des vertikalen Elements erstreckt und mit Montagelöchem oder sonstigen Mitteln versehen ist, um die Hilfselemente aufzunehmen.

13. Vorrichtung gemäß einem der Ansprüche 1 bis 12, wobei das Basiselement eine Fahrbahn aufweist.

14. Vorrichtung gemäß einem der Ansprüche 1 bis 13, wobei das Basiselement auf dem Fußboden montiert oder im Fußboden integriert ist.

15. Vorrichtung gemäß einem der Ansprüche 1 bis 14, wobei das Basiselement oder die Fahrbahn auf einem Drehgesteli montiert ist, welches auf dem Fußboden montiert oder im Fußboden integriert ist.

16. Vorrichtung gemäß einem der Ansprüche 1 bis 15, zusätzlich aufweisend ein Hilfselement, welches zum Ziehen der körperbehinderten Person in die aufgerichtete Stellung, und gleichzeitig nach oben, eingerichtet ist, um der körperbehinderten Person behilflich zu sein, sich von der sitzenden in eine stehende Position, oder von der stehenden in die sitzende Position zu bringen.

17. Vorrichtung gemäß Anspruch 16, wobei das Hilfselement mit dem aufrechten Element über einen Draht, z.B. ein Aufhängeband (51), verbunden ist, welches um eine kraftangetriebene Haspel gewikkelt ist, welche am aufrechten Element montiert oder mit diesem integriert ist, wobei die ziehende Bewegung in aufgerichtete Position dadurch bewirkt wird, daß der Draht um die Haspel (53,54) gewickelt wird, und die Bewegung nach oben oder nach unten durch vertikale Bewegung des aufrechten Elements bewirkt wird.

18. Vorrichtung gemäß Anspruch 16 oder 17, zusätzlich aufweisend eine Fußoder Beinstütze, um die Füße und/oder die Beine der körperlich behinderten Person zu stützen.

19. Vorrichtung gemäß einem der Ansprüche 1 bis 18, wobei die Hilfselemente einen zusätzlichen Sitz (82) umfassen, der auf einem Arm montiert ist, der am aufrechten Element montiert sein kann, so daß er um eine im wesentlichen horizontale Achse geschwankt werden kann, wobei dieser Sitz zwischen stützenden und nichtstützenden Positionen geschwenkt werden kenn.

20. Vorrichtung gemäß Anspruch 19, zusätzlich aufweisend ein oder mehrere, den Bauch stützende Element(e) (83), die so am Arm montiert sind, daß sie den Bauch der Person stützen.

21. Vorrichtung gemäß einem der Ansprüche 1 bis 20, wobei die Hilfselemente eine Tischplatte (90) umfassen, die am aufrechten Element mit den genannten Montagemitteln montiert ist, so daß sie abgesenkt oder gehoben werden kann.

22. Vorrichtung gemäß einem der Ansprüche 1 bis 21, wobei die Hilfselemente wenigstens zwei Stützplatten (140-143) umfassen, die schwenkbar miteinander verbunden sind entlang einer ihrer respektiven Kanten, so daß sie in ausgerichteter Position eine tragende Fläche für eine liegende Person bilden und in nicht ausgerichteter Position die tragenden Flächen für eine sitzende Person definieren.

23. Vorrichtung gemäß Anspruch 22, zusätzlich aufweisend Feststellmittel zum Festklemmen der zwei tragenden Platten in verschiedenen gegenseitigen Stellungen.

24. Vorrichtung gemäß Anspruch 22 oder 23, zusätzlich aufweisend kraftangetriebene Mittel für die Schwenkbewegung der tragenden Platten relativ zueinander.

25. Vorrichtung gemäß einem der Ansprüche 22 bis 24, drei Tragplatten umfassend, wobei eine Kante einer ersten Tragplatte schwenkbar mit einer ersten Kante einer zweiten Tragplatte, und eine Kante einer dritten Tragplatte schwenkbar mit einer zwelten Kante der zweiten Tragplatte verbunden sind, wobei die zweite Kante der zweiten Tragplatte der ersten Kante gegenüberliegt.

26. Vorrichtung gemäß einem der Ansprüche 22-25, wobei wenigstens eine der tragenden Platten mit einem Autriebsgurt versehen ist, um eine liegende Person auf die mit den tragenden Platten definierte Stützfläche zu legen oder von ihr herunterzuholen.

Revendications

1. Dispositif de levage et / ou de transport pour des

personnes handicapées, ledit dispositif comprenant :

un élément de base (1, 33), qui définit un secteur intérieur, un plan sensiblement horizontal et un axe central géométrique qui s'étend perpendiculaire audit plan, et un montant (2, 21, 32, 72, 91) qui s'étend à partir de l'élément de base, le montant comprenant :

- des moyens de montage (3), qui sont conçus pour recevoir un ou plusieurs éléments d'aide (22, 33, 30, 60, 61, 50 - 52, 70, 80 - 83, 90, 100) pour aider une personne handicapée, et

- des moyens de levage pour lever ou abaisser l'élément d'aide, qui comprennent un siège (34), et qui sont montés de manière rotative autour d'un axe de rotation et portés par un bras de support (31), qui est monté dessus et s'étend de manière transversale à partir du montant dans une direction vers le secteur intérieur (38) de l'élément de base,

caractérisé en ce que le siège (34) est monté sur le bras de support (31) à l'aide d'un palier, sur lequel se trouve le siège et qui comprend :

un élément en forme d'anneau (39), dont le centre définit ledit axe de rotation, et des éléments de palier (39a), qui peuvent de déplacer par rapport à, et le long de, l'élément en forme d'anneau, les éléments de palier et l'élément en forme d'anneau constituant un guide pour le déplacement en rotation du siège par rapport à l'élément en forme d'anneau, la distance linéaire entre ledit axe de rotation du siège (34) et l'axe central géométrique de l'élément de base (1, 33) étant au plus de 20 cm, lorsque le siège tourne autour de l'axe de rotation à l'intérieur d'une plage angulaire d'au moins 45 °.

2. Dispositif selon la revendication 1, dans lequel les éléments de palier (39a) sont montés sur le siège (34), et dans lequel l'élément en forme d'anneau (39) est monté sur le bras de support (31).

3. Dispositif selon l'une quelconque des revendications 1 ou 2, dans lequel un orifice de toilettes (41) est fourni dans le siège (34), l'orifice de toilettes étant agencé à l'intérieur de la périphérie intérieure de l'élément en forme d'anneau (39) lorsqu'il est vu en projection dans le plan.

4. Dispositif selon l'une quelconque des revendications 1-3, dans lequel l'élément de base (1, 33) est en forme de U.

5. Dispositif selon la revendication 4, dans lequel l'élément de base en forme de U est conçu pour être monté de manière rotative et / ou mobile par rapport au plancher.

6. Dispositif selon la revendication 5, dans lequel l'élément de base en forme de U est supporté par une pluralité de roues ou de rouleaux.

7. Dispositif selon la revendication 6, dans lequel l'élément de base comprend des moyens d'entraînement pour entraîner les roues ou les rouleaux.

8. Dispositif selon l'une quelconque des revendications 1 - 7, comprenant de plus un dispositif de verrouillage (10) pour verrouiller le siège (34) par rapport au bras de support (31).

9. Dispositif selon la revendication 8, dans lequel le dispositif de verrouillage comprend un ou plusieurs cliquets chargés par un ressort (15), qui sont conçus pour mettre en prise des rainures correspondantes fournies dans l'ameublement (16).

10. Dispositif selon l'une quelconque des revendications 8 ou 9, dans lequel le dispositif de verrouillage (10) comprend de plus une poignée de libération (11) pour rétracter un ou plusieurs cliquets (15) des rainures de l'ameublement, afin de libérer le siège et permettre la rotation de celui-ci.

11. Dispositif selon l'une quelconque des revendications 1 - 10, dans lequel l'axe de rotation coïncide sensiblement avec l'axe longitudinal du torse d'une personne assise tout droit sur le siège (34).

12. Dispositif selon l'une quelconque des revendications 1-11, dans lequel les moyens de montage (3) comprennent une tôle ou une plaque, qui s'étend le long de la hauteur du montant et est fournie avec des trous de montage ou d'autres moyens pour recevoir les éléments d'aide.

13. Dispositif selon l'une quelconque des revendications 1 - 12, dans lequel l'élément de base comprend une voie.

14. Dispositif selon l'une quelconque des revendications 1 - 13, dans lequel l'élément de base est monté sur, ou intégré dans, un plancher.

15. Dispositif selon l'une quelconque des revendications 1 - 14, dans lequel l'élément de base ou la voie est monté sur une plaque tournante qui est montée sur, ou intégrée dans, un plancher.

16. Dispositif selon l'une quelconque des revendications 1 - 15, comprenant de plus un élément d'aide conçu pour tirer la personne handicapée vers le montant et pour tirer simultanément la personne handicapée dans une direction vers le haut, afin d'aider la personne handicapée en la levant d'une position assise dans une position debout et / ou en la plaçant d'une position debout dans une position assise.

17. Dispositif selon la revendication 16, dans lequel l'élément d'aide est relié au montant par un câble par exemple, une sangle de suspension (51), qui est enroulé autour d'une bobine motorisée reliée au, ou intégrée dans le, montant, le mouvement de traction vers le montant étant fourni en enroulant le fil autour de la bobine (53, 54), le mouvement vers le haut ou vers le bas étant fourni par le mouvement vertical du montant.

18. Dispositif selon l'une quelconque des revendications 16 ou 17, comprenant de plus un repose-pied ou un repose-jambe pour supporter les pieds et / ou les jambes de la personne handicapée.

19. Dispositif selon l'une quelconque des revendications 1 - 18, dans lequel les éléments d'aide comprennent un autre siège (82) monté sur un bras, qui peut être monté sur le montant afin de pivoter autour d'un axe sensiblement horizontal, grâce à quoi ledit siège peut être tourné entre des positions de support et de non support.

20. Dispositif selon la revendication 19, comprenant de plus un ou plusieurs éléments de support d'abdomen (83) montés sur le bras afin de supporter l'abdomen de la personne.

21. Dispositif selon l'une quelconque des revendications 1 - 20, dans lequel les éléments d'aide comprennent une tôle de table (90) montée sur le montant par lesdits moyens de montage afin d'être abaissée ou levée.

22. Dispositif selon l'une quelconque des revendications 1-21, dans lequel les éléments d'aide comprennent au moins deux plaques de support (140 - 143), qui sont interconnectées de manière pivotante le long d'un de leurs bords respectifs, de telle sorte qu'elles définissent dans une position alignée une surface de support pour une personne allongée, et de telle sorte qu'elles définissent dans une position non alignée des surfaces de support pour une personne assise.

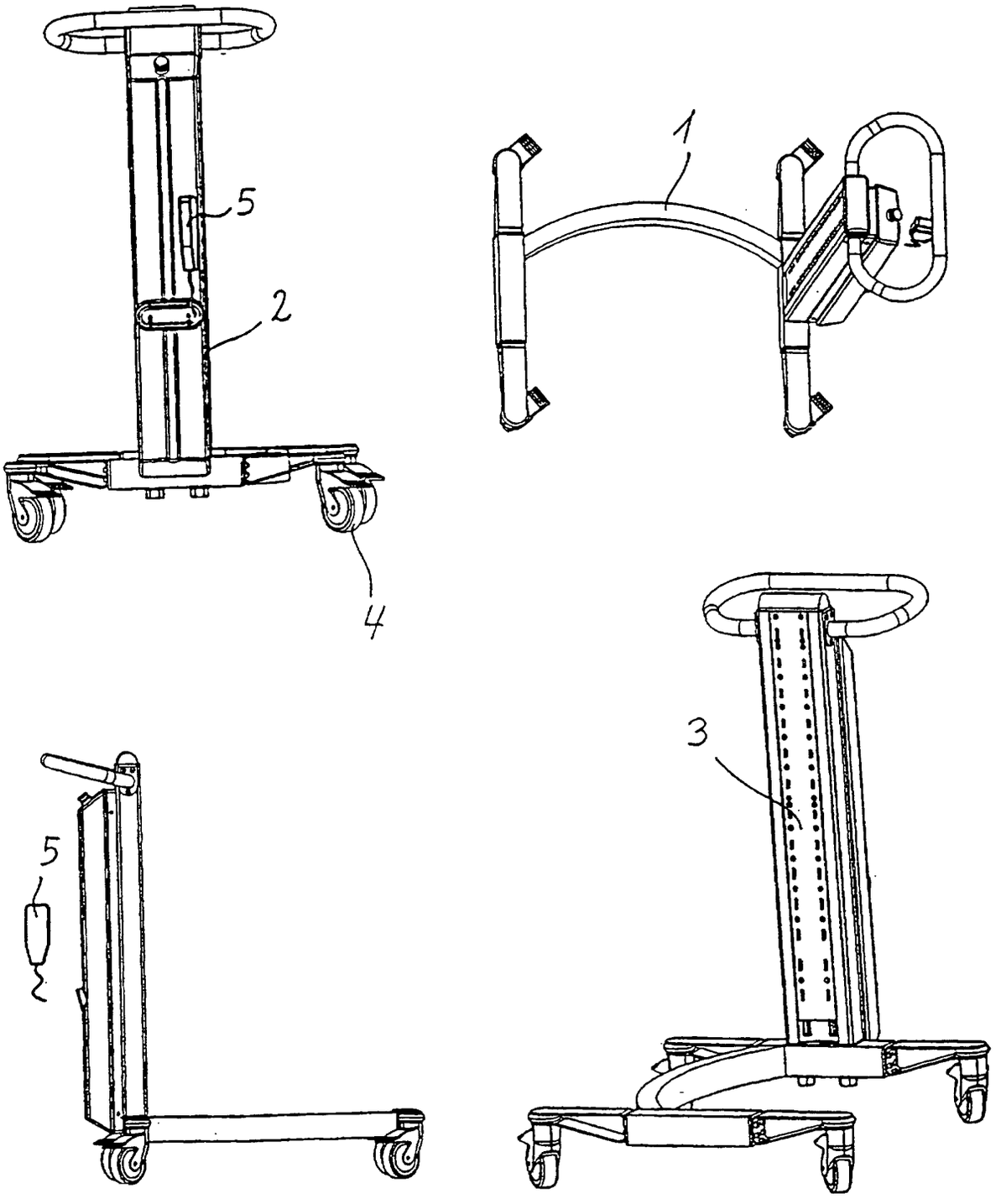
23. Dispositif selon la revendication 22, comprenant de plus des moyens de verrouillage pour verrouiller ensemble les deux plaques de support dans différentes positions mutuelles.

24. Dispositif selon l'une quelconque des revendications 22 ou 23, comprenant de plus des moyens motorisés pour déplacer en rotation les plaques de support l'une par rapport à l'autre.

25. Dispositif selon l'une quelconque des revendications 22 - 24, comprenant trois plaques de support, un bord d'une première plaque de support étant relié de manière pivotante à un premier bord d'une deuxième plaque de support, et un bord d'une troisième plaque de maintien étant relié de manière pivotante à un deuxième bord de la deuxième plaque de support, le deuxième bord de la deuxième plaque de support étant opposé au premier bord.

26. Dispositif selon l'une quelconque des revendications 22 - 25, dans lequel au moins l'une des plaques de support est fournie avec une sangle d'entraînement pour charger ou décharger une personne allongée vers, ou depuis, la surface de support définie par les plaques de support.

Fig. 1



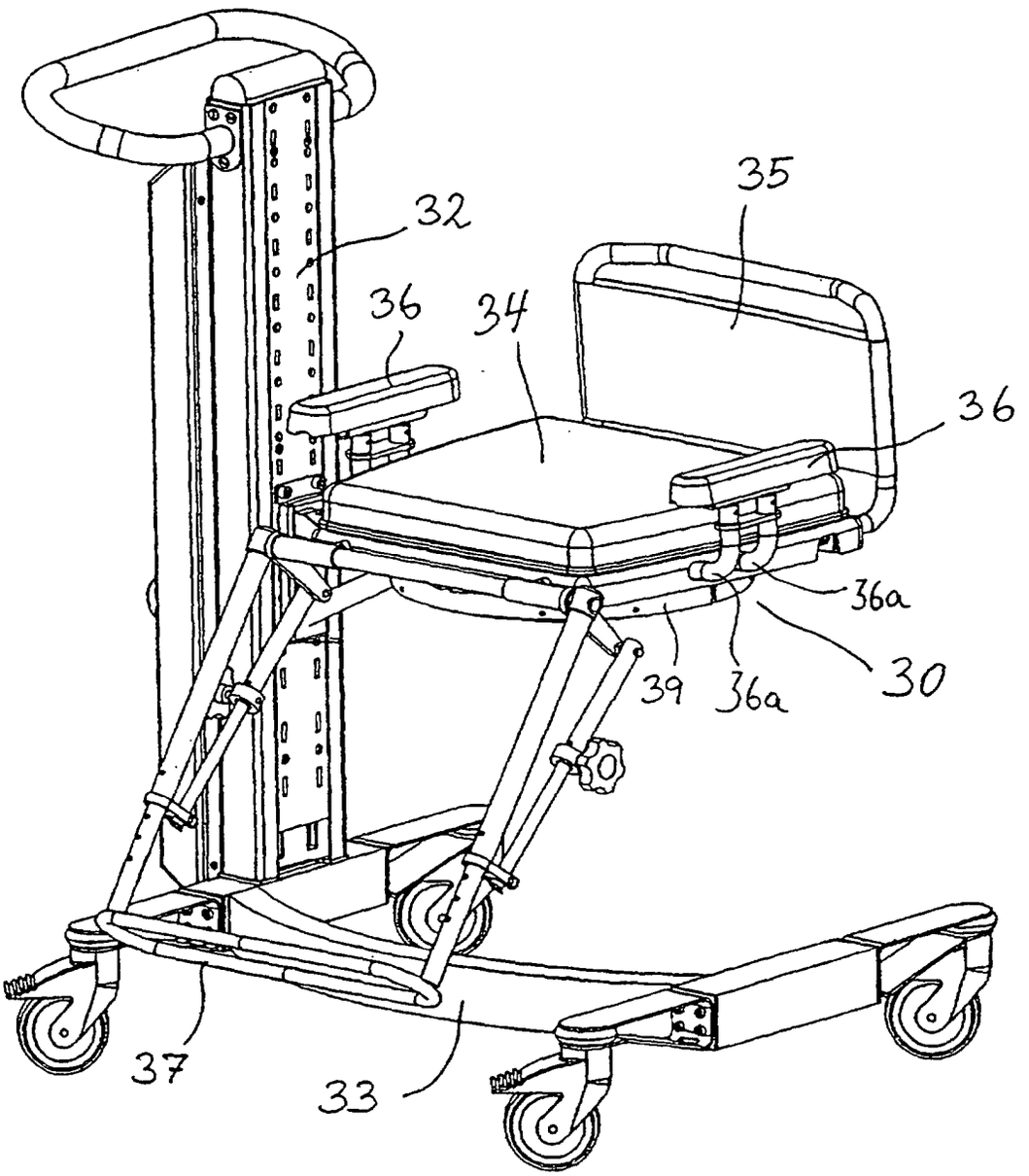


Fig. 2a

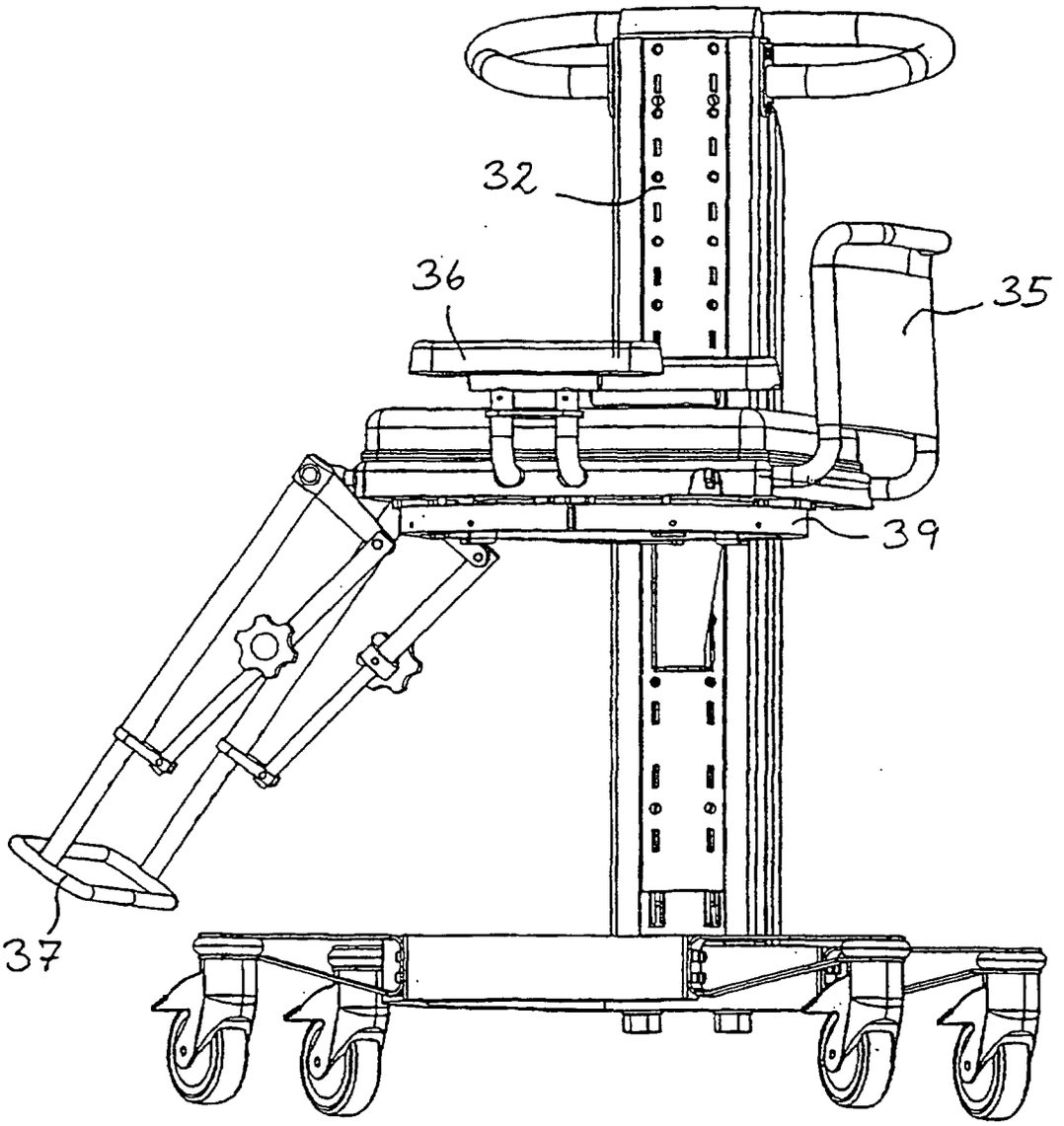


Fig. 2b

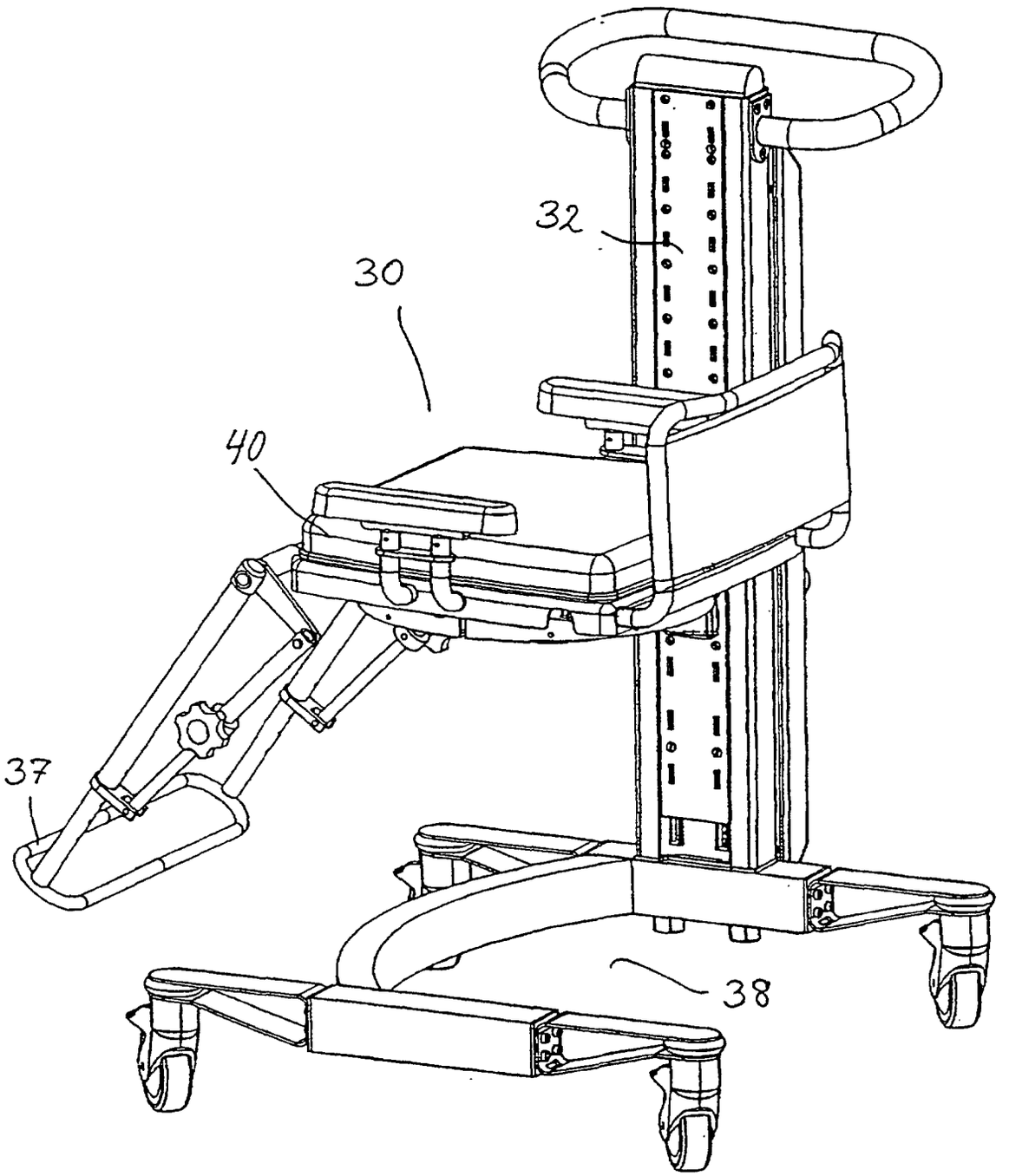


Fig. 2c

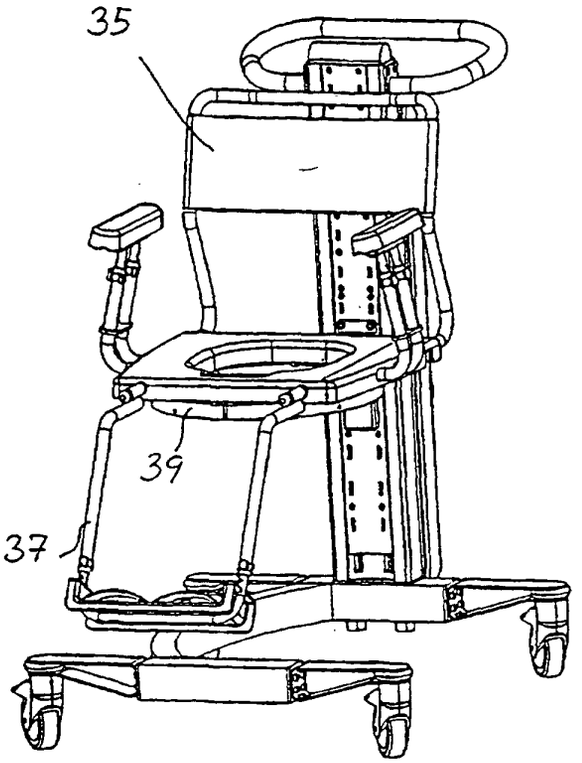


Fig. 2d

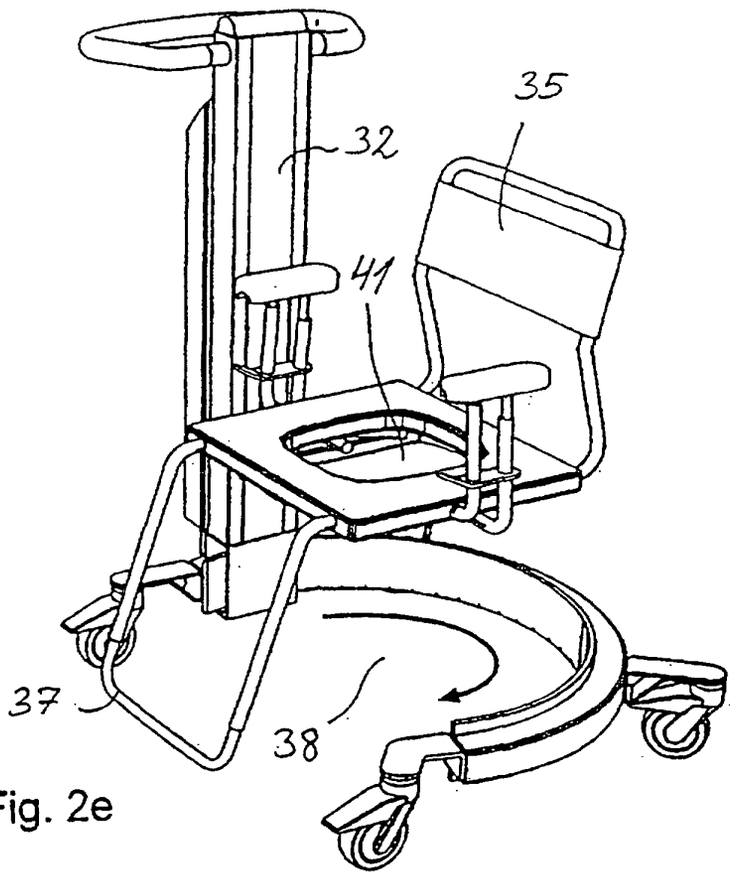


Fig. 2e

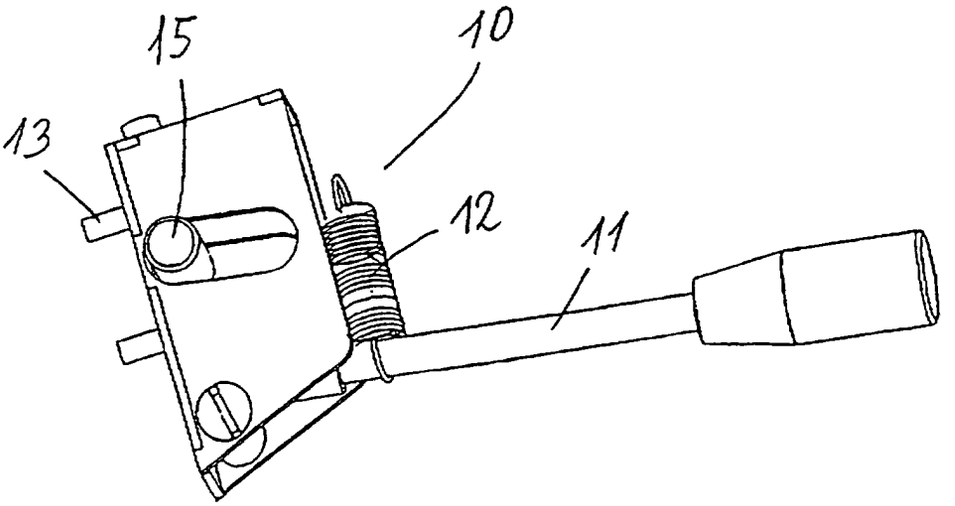


Fig. 3a

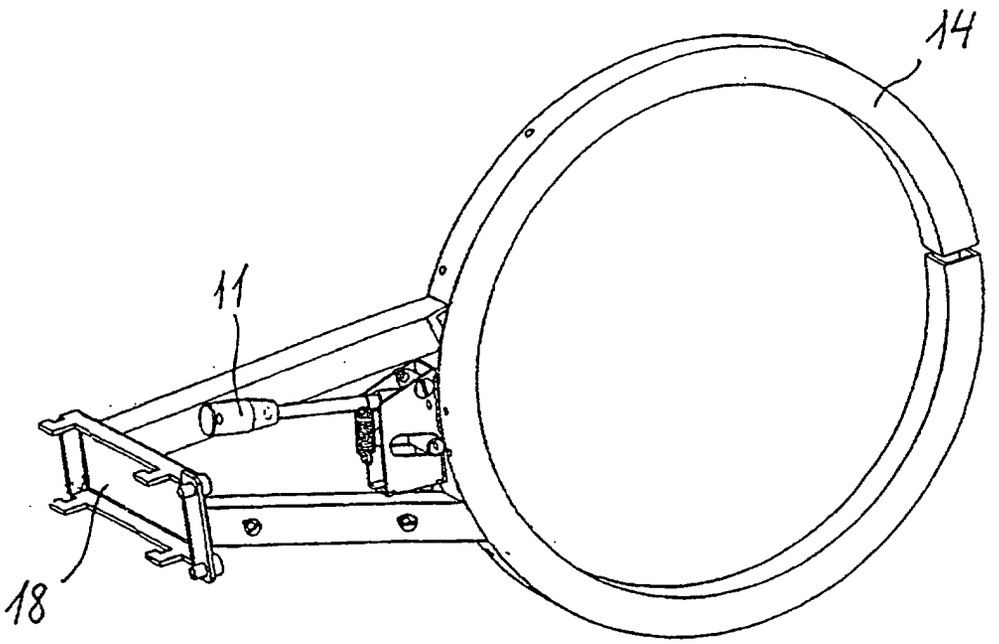


Fig. 3b

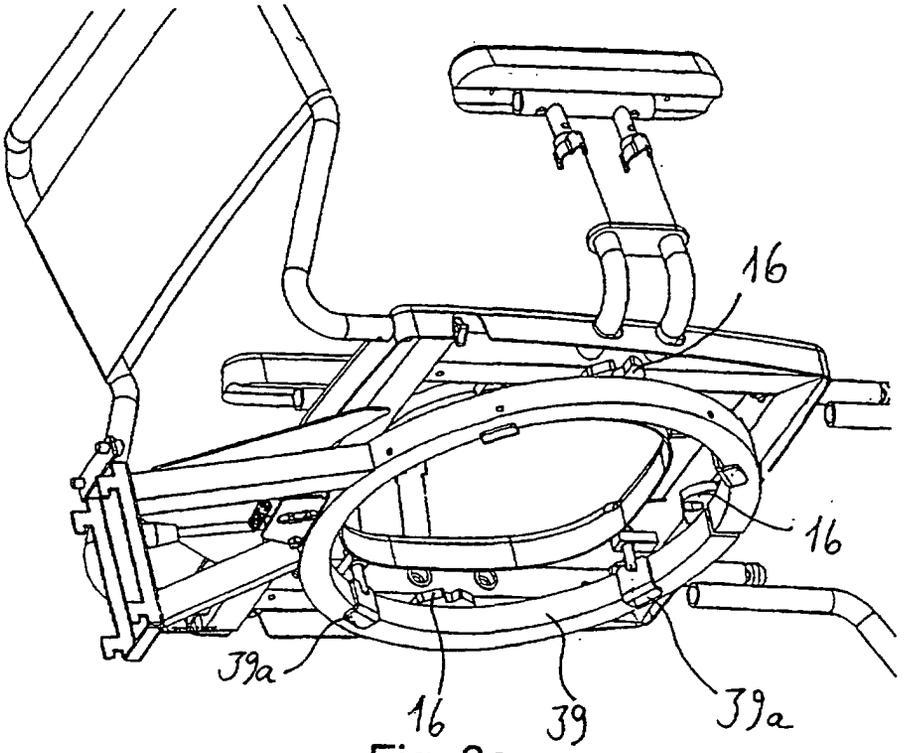


Fig. 3c

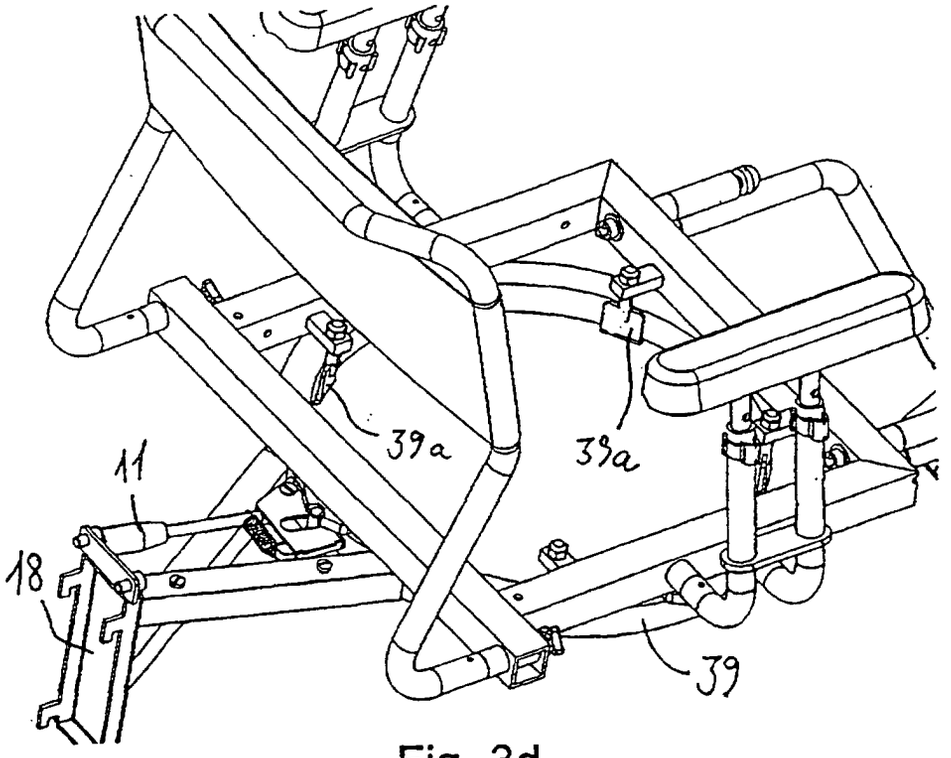


Fig. 3d

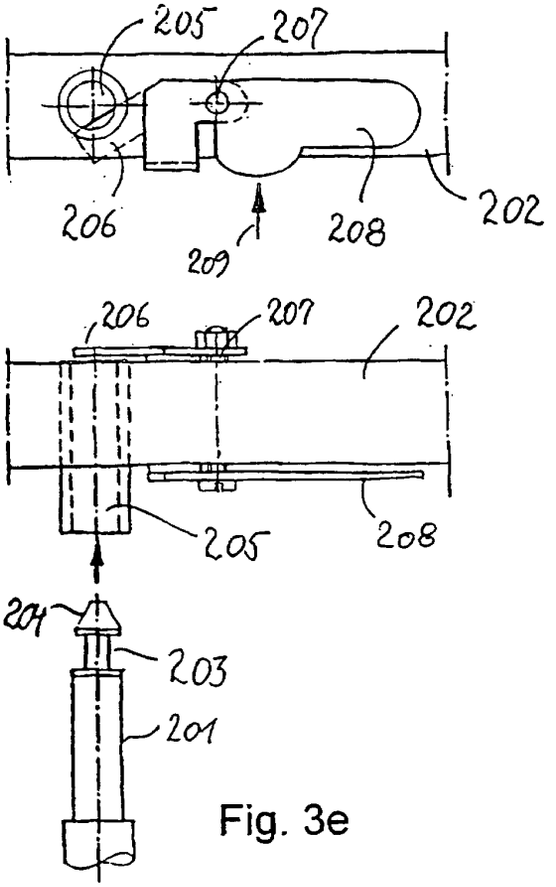

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Fig. 3e

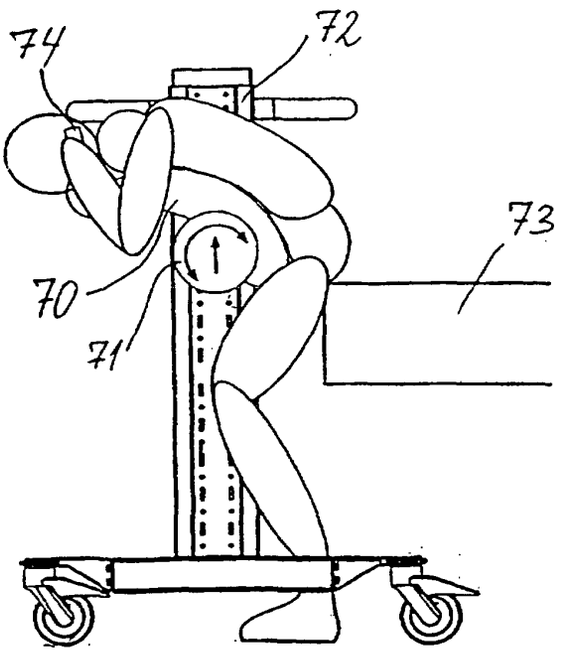
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Fig. 4

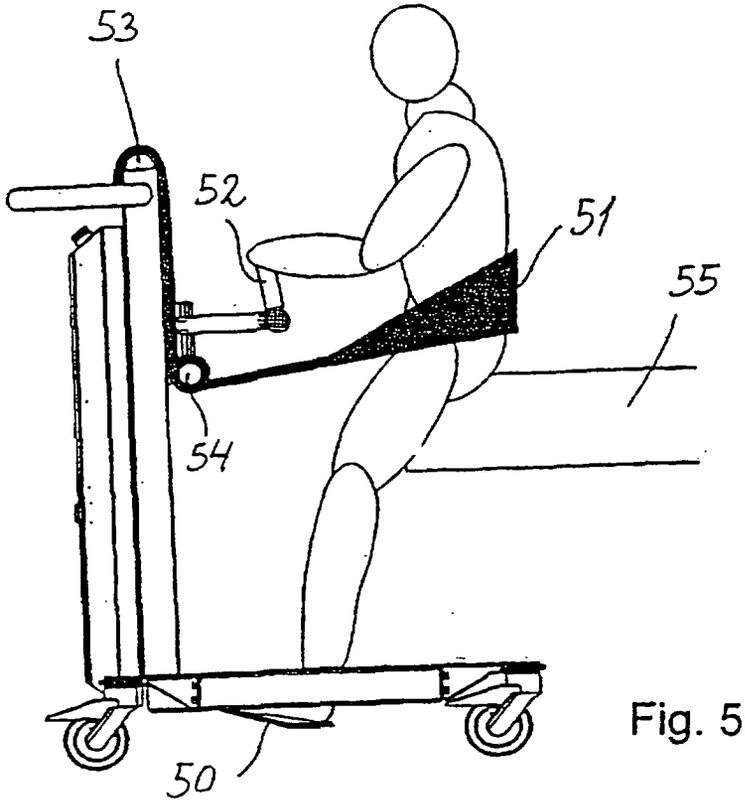

Fig. 5a

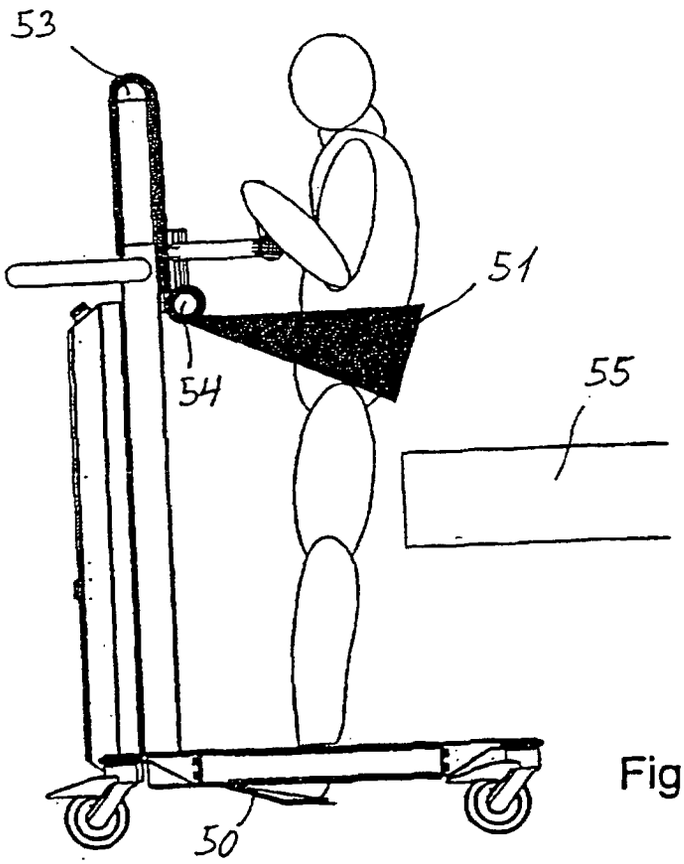

Fig. 5b

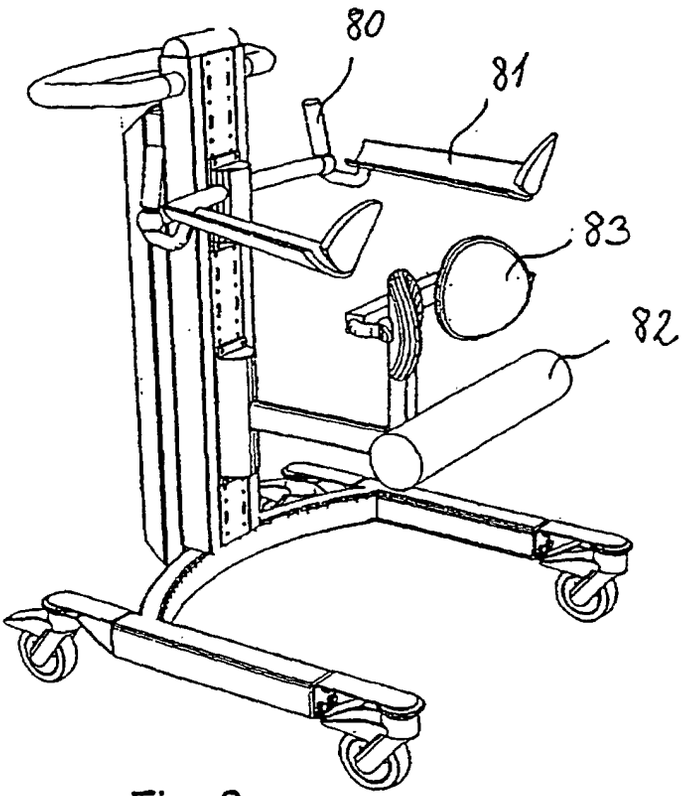

Fig. 6a

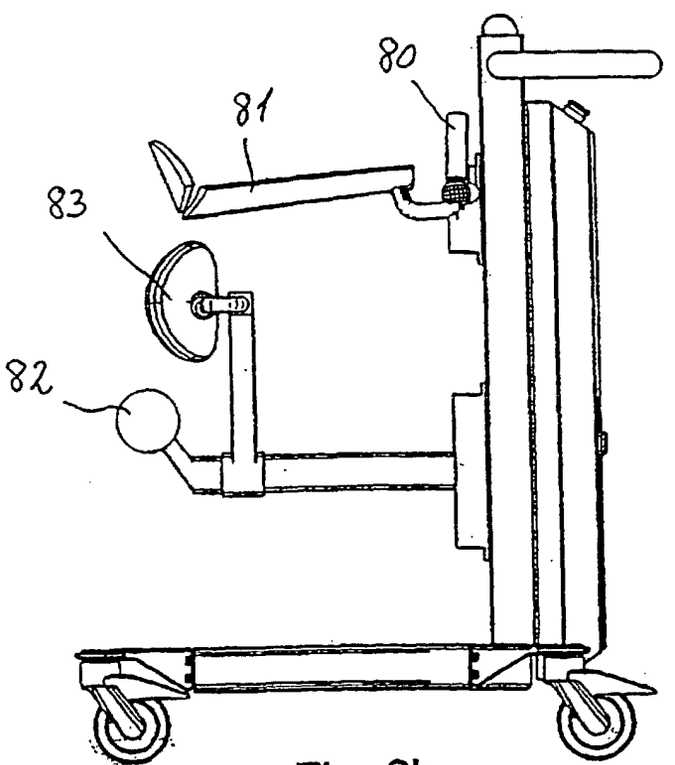

Fig. 6b

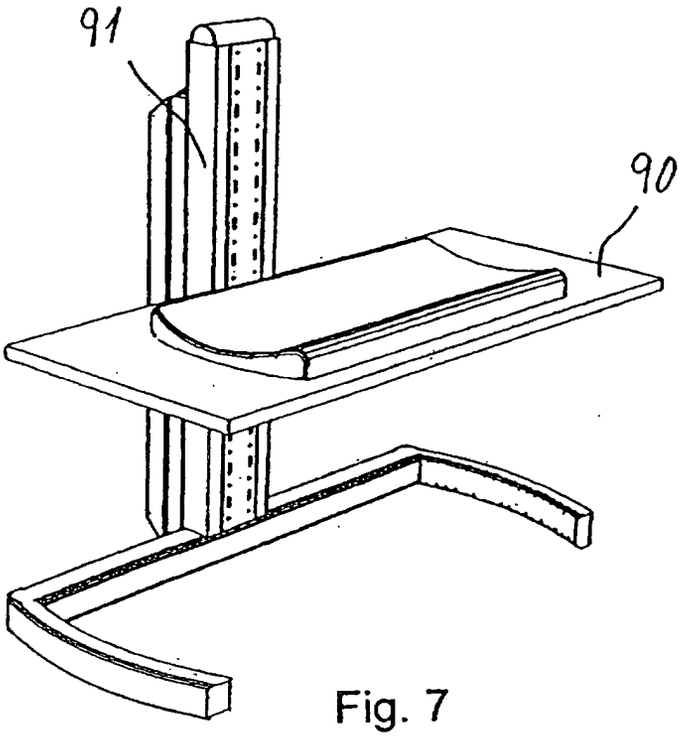

Fig. 7

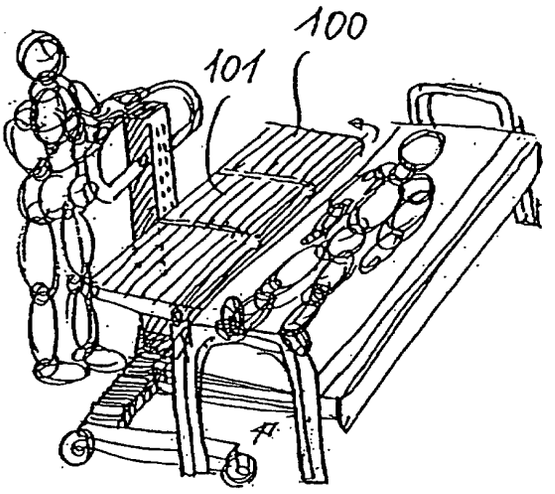

Fig. 8

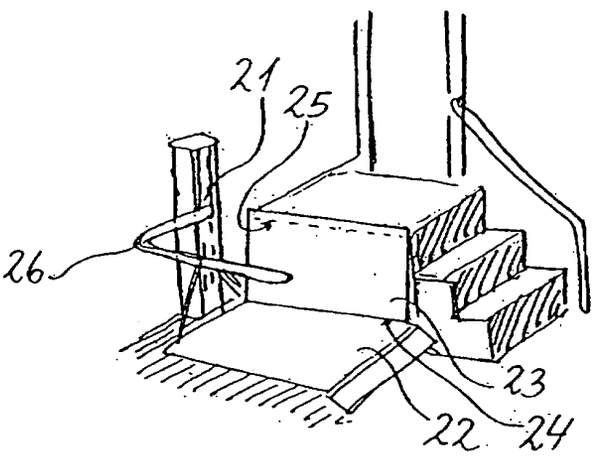

Fig. 9

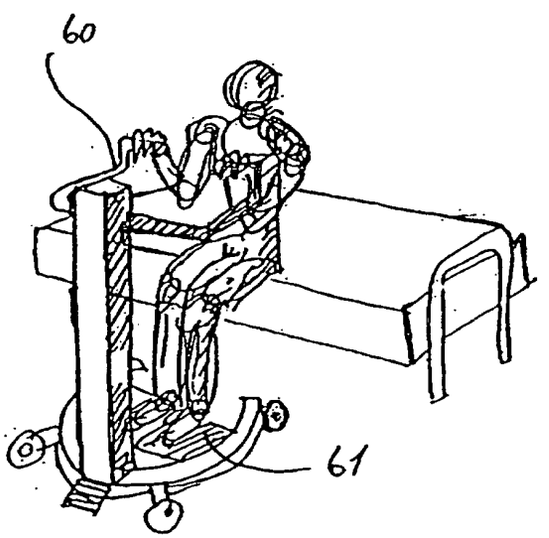

Fig. 10