



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 595 520 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
16.11.2005 Bulletin 2005/46

(51) Int Cl.7: **A61G 7/10**

(21) Application number: **05076087.5**

(22) Date of filing: **10.05.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

(72) Inventor: **Van Scheppingen, Mattheas Robertus**
8077 TB Hulshorst (NL)

(74) Representative: **De Hoop, Eric**
Octrooibureau Vriesendorp & Gaade B.V.
P.O. Box 266
2501 AW Den Haag (NL)

(30) Priority: **12.05.2004 NL 1026184**

(71) Applicant: **Exodus Holding B.V.**
8071 RC Nunspeet (NL)

(54) **Hoist device for moving a person**

(57) The invention relates to a hoist device for moving a person from a recumbent to a sitting position, or vice versa, wherein the hoist device comprises a suspension assembly and first and second arm members extending in opposite direction for attaching a sling thereto, wherein the second arm members, intended for carrying the person's pelvic area, is rotatable about a substantially horizontal axis, and wherein the first arm members, intended for carrying the person's shoulder area, at least in a direction perpendicular to the axis, extend from the suspension assembly over a distance that exceeds the distance between an average person's shoulder and crown.

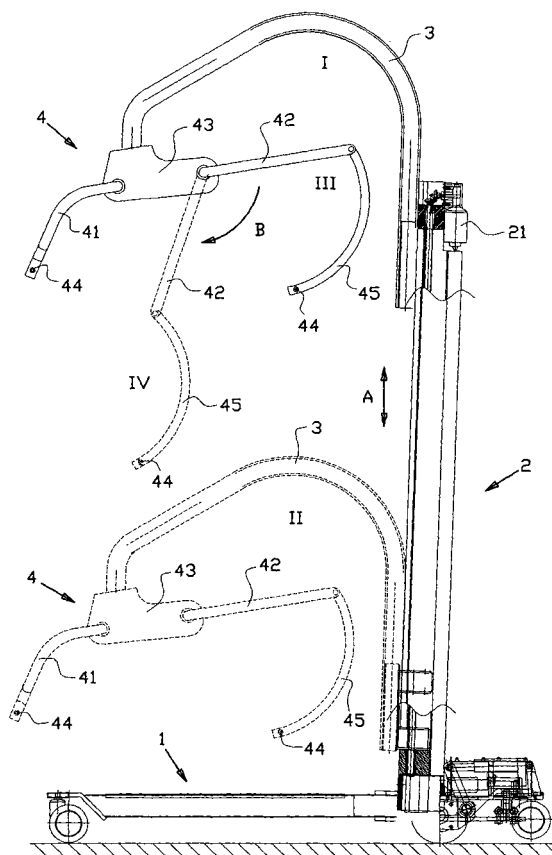


FIG. 1

EP 1 595 520 A1

Description

[0001] The invention relates to a hoist device for moving a person from a recumbent to a sitting position or vice versa. The invention in particular relates to a hoist device for lifting, placing down, transporting or manoeuvring a person requiring care. The invention further relates to a lift device and a ceiling lift comprising such a hoist device.

[0002] Such hoist devices are usually used in health care to reduce the physical load of persons giving care when lifting or placing down a person requiring care, such as for instance a patient, a disabled person or a sick person.

[0003] Known hoist devices for moving a patient from a recumbent to a sitting position, or vice versa, are provided with supporting arms for attaching a sling thereto. In this known hoist device the distance between the attachment of the sling to the supporting arms and the part of the sling supporting the patient is large. A drawback thereof is that when transferring the patient from the one to the other position, the patient may slide in the sling as a result of which the patient may not end up in the desired position. In case this happens the person giving care has to lift the patient in the desired position as yet, which usually has to be done by hand and thus is an extra physical exertion for the persons giving care.

[0004] The known hoist devices furthermore are provided with a mechanism wherein the supporting arms are movable about horizontal axes. A drawback thereof is that in this case as well the patient may slide in the sling during the transfer.

[0005] It is an object of the invention to improve on at least one of the said drawbacks.

[0006] To that end the invention provides a hoist device for moving a person from a recumbent to a sitting position, or vice versa, wherein the hoist device comprises a suspension assembly and first and second arm members extending in opposite direction for attaching a sling thereto, wherein the second arm members, intended for carrying the person's pelvic area, are rotatable about a substantially horizontal axis, and wherein the first arm members, intended for carrying the person's shoulder area, at least in a direction perpendicular to the axis, extend from the suspension assembly over a distance that exceeds the distance between an average person's shoulder and crown.

[0007] By designing the first arm members for carrying a person's shoulder area in such a way that they extend over a distance exceeding the distance between an average person's shoulder and crown, a sling can be used wherein the attachment points of the sling to said first arm members can be placed close to a shoulder of the person in the sling, without the person in the sling bumping his/her head to the other parts of the hoist device. Preferably the attachment points of the sling at said first arm members remain close to the person's shoulder or shoulders during moving the person from a recum-

bent to a sitting position or vice versa. Because the attachment points of the sling are placed close to the person's shoulder, the shape and thus the fit of the sling is predominantly defined by the shape of the first arm members, instead of by the shape of a sagging sling like in the known devices. As a result a better fit of the sling can be achieved due to which the person in the sling can be more stably supported and as a result of which the risk of the person in the sling sliding during transfer can be reduced.

[0008] In the hoist device according to the invention the dimensions of said hoist device, and particularly those of the arm members, are derived from human sizes. Preferably said arm members are adapted to the person to be moved. However when using a hoist device according to the invention for several different persons the dimensions of the hoist device are at least partially derived from the sizes of an average person. The sizes of an average person are the subject of studies for designing for instance furniture or stairs and doors. The inventor realised that the results of these studies can also be used in the design of hoist devices for persons requiring care. By basing the dimensions of the hoist device on the sizes of an average person, a hoist device can be designed in which a person requiring care can be accommodated with a better fit or more stably.

[0009] In an embodiment the dimensions of the hoist device, and particularly of its arm members, can be adapted to the sizes and dimensions of an average child, an average adolescent, an average adult, an average male or an average female.

[0010] In one embodiment the first arm members are rotation fixedly placed at the suspension assembly. When moving a person from a sitting to a recumbent position by means of this embodiment of the device according to the invention, only the second arm members are rotated about the horizontal axis. The sling is then pulled underneath the person. As the position of first arm members for carrying a person's shoulder area is fixed with respect to the hoist device and the sling is pulled underneath the person, it can at least to a large extent be prevented that the person slides in the sling during the transfer.

[0011] In an embodiment the second arm members comprise a connection member that is placed thereon so as to hinge, wherein the connection member at an end thereof extending away from the second arm members is provided with attachment means for attaching the sling thereto. In this case as well the dimensions of the second arm members and the connection member are preferably based on the dimensions of the average person. The length of the second arm members and the connection member are selected such that an average person can be placed in a substantially horizontal recumbent position with raised legs. The attachment points of the sling to the connection member can in this case preferably be placed close to a knee or upper leg of the person in the sling. Preferably the attachment

points of the sling to the connection member also remain close to a knee or upper leg of the person during moving said person from a recumbent to a sitting position or vice versa. Because the attachment points of the sling are placed close to the person's knee or upper leg, the shape and as a result the fit of the sling is defined predominantly by the shape of the second arm members with connection member, instead of by the shape of a sagging sling like in the known devices. As a result a better fit of the sling can be achieved at least as regards the section supporting the pelvis, as a result of which the person in the sling can be more stably supported.

[0012] Preferably the dimensions of the first arm members, the second arm members and the connection member are based on the sizes of an average person, so that the attachment points of the sling to the first arm members are placed close to a shoulder of an average person in the sling, and so that the attachment points of the sling to the connection member are placed close to a knee or upper leg of an average person in the sling. Preferably the attachment points of the sling remain close to the shoulder or shoulders and close to a knee or upper leg of the average person when moving a person from a recumbent to a sitting position, or vice versa.

[0013] Preferably the connection member is curved. Due to the curved shape a person in the sling can be more easily pushed to the back of a chair or wheelchair, so that after placing this person using the hoisting device according to the invention a better sitting position is realised. In addition the curved connection member is able to create more distance between the connection member and the front side of a person in the sling, as a result of which this person has more room to move.

[0014] In an embodiment the second arm members are rotatable for placing the hoist device in a first position for supporting the person in a sitting position and in a second position for supporting the person in a recumbent position. Preferably the angle of rotation of the second arm members between the first position and the second position exceeds 90°. Preferably the angle of rotation exceeds 120°. Due to the large angle of rotation the hoist device can both be placed in a first position for supporting the person in the sling in a proper sitting position, and be placed in a second position for supporting the person in the sling in a recumbent position, preferably with raised legs.

[0015] Preferably the second arm members are rotatable over an angle exceeding the angle of rotation between the first and second position. As a result the person in the carrying path can be lifted past the sitting and/or recumbent position.

[0016] When lifting the person past the sitting position, he/she is brought in a slightly headlong position. In this position the person can more easily be pushed into the back of a chair or wheelchair.

[0017] When lifting a person past the recumbent position, the person's pelvic area is lifted slightly higher than the person's shoulder area. In this position first the

person's shoulder area can be placed on a supportive surface of for instance a bed. Subsequently, when the shoulder area is properly positioned, the person's pelvic area can also be placed on the supportive surface.

[0018] In an embodiment the hoist device comprises two first arm members that are placed substantially parallel and spaced apart. As a result the head of the person in the sling can move between the first arm members. Preferably each of the two first arm members can be placed close to an average person's shoulder. Preferably the distance between the arm members exceeds the average person's shoulder width.

[0019] In an embodiment the second arm members comprise a substantially closed handle or hoop. The handle-shaped or hoop-shaped second arm members thus form a support to which the person in the sling can hold on during moving from a recumbent to a sitting position, or vice versa.

[0020] In an embodiment the hoist device comprises drive means for driving the second arm members. Preferably the drive means comprise an electromotor. In this way the physical load of the persons giving care when moving a person requiring care from a recumbent to a sitting position, or vice versa, can be further reduced.

[0021] According to a second aspect the invention provides a lift device comprising a base, a post placed on the base, the post having a hoist device as described above. Preferably the base is provided with running wheels.

[0022] According to a third aspect the invention provides a ceiling lift comprising a trolley to be placed in a ceiling rail and movable along said rail, the trolley having a hoist device as described above.

[0023] According to a fourth aspect the invention provides a hoist device for moving a person from a recumbent to a sitting position, or vice versa, wherein the hoist device comprises a suspension assembly and first and second arm members extending in opposite direction from the suspension assembly for attaching a sling thereto, wherein the first and/or second arm members are rotatable about at least one substantially horizontal axis for placing the hoist device in a first position for supporting the person in a sitting position and in a second position for supporting the person in a recumbent position, wherein the first and/or second arm members are rotatable over an angle of rotation exceeding the angle of rotation between the first and the second position.

[0024] According to a fifth aspect the invention provides a method for moving a person by means of a hoist device from a recumbent to a sitting position, or vice versa, wherein the person during moving, at least temporarily, is lifted past the sitting and/or recumbent position. In an embodiment the person is placed in a sling attached to the hoist device, wherein the hoist device can be placed in a first position for supporting the person in a sitting position and in a second position for supporting the person in a recumbent position. In an embodiment the person, during moving the person from the second

to the first position, can at least temporarily be moved or lifted past the first position. In a further embodiment the person, during moving the person from the first to the second position, can at least temporarily be moved or lifted past the second position.

[0025] The invention will be elucidated on the basis of the exemplary embodiment shown in the attached drawings, in which:

Figure 1 shows a schematic side view, partially in cross-section, of an exemplary embodiment of a lift device provided with a hoist device according to the invention;

Figure 2 shows a schematic side view of a hoist device according to the invention, wherein the hoist device is placed in a position for supporting a person in a recumbent position;

Figure 3 shows a schematic side view of a hoist device according to the invention, wherein the hoist device is placed in a position for supporting a person in the sitting position; and

Figure 4 shows a schematic view in perspective of the hoist device according to the invention.

[0026] The exemplary embodiment of a hoist device for moving a person from a recumbent to a sitting position, or vice versa, as schematically shown in figure 1, comprises a mobile base 1 provided with a post 2. The post 2 is provided with a supporting jib 3 to which a hoist device 4 is connected. The supporting jib 3 with hoist device 4 can be moved up and down (along arrow A) along the post 2 between a highest position I and a lowest position II. In this exemplary embodiment the post 2 is provided with a drive 21 for driving the movement of the supporting jib 3 with hoist device 4. The hoist device 4 comprises a suspension assembly 43 with which the hoist device 4 is connected to the supporting jib 3. Preferably the suspension assembly 43 is connected to the supporting jib 3 so as to be rotatable about a substantially vertical axis.

[0027] The hoist device 4 comprises first arm members 41 and second arm members 42 that extend in opposite direction from a suspension assembly 43. The ends of the first arm members 41 are provided with connection means 44 for attaching a sling (not shown) thereto in which a person requiring care can be placed.

[0028] At the side of the second arm members 42 facing away from the suspension assembly 43 a connection member 45 is placed that is connected thereto so as to hinge freely, wherein the connection member 45 at an end thereof extending away from the second arm members 42 is provided with connection means 44 for attaching the sling (not shown) thereto.

[0029] When lifting a person requiring care from a recumbent position for instance on the floor, the support-

ing jib 3 with hoist device 4 is placed in the lowest position II near the person requiring care. The sling is placed under the person requiring care wherein the part supporting the shoulder area of the person requiring care is connected to the first arm members 41 and wherein the part supporting the pelvic area of the person requiring care is connected to the second arm members 42. After that the supporting jib 3 with hoist device 4 can be moved upward along the post 2 for lifting the person requiring care.

[0030] The second arm members 42 are coupled to a drive for swinging the second arm members 42 with connection member 45 from a first position III for supporting the person requiring care in a recumbent position, to a second position IV for supporting the person requiring care in a sitting position, in the direction B, or vice versa. Said drive, for instance in the form of an electromotor, preferably is entirely or partially placed at the suspension assembly 43 or in its housing.

[0031] Position III with a schematically shown person requiring care is shown in figure 2. Figure 2 schematically shows the mutual position of the person requiring care 5 in a sling (not shown) in a recumbent position with raised legs and the hoist device 4.

[0032] Position IV with a schematically shown person requiring care is shown in figure 3. Figure 3 schematically shows the mutual position of the person requiring care 5 in a sling (not shown) in a sitting position and the hoist device 4.

[0033] The dimensions of the exemplary embodiment as shown in figures 2 and 3 are based on the sizes of an average adult. There are several sources for the average human size. An example of the sizes relevant to the hoist device are indicated by means of letters in the figures 2 and 3, wherein:

a = 22.8 cm
b = 38.1 cm
c = 89 cm
d = 38 cm
e = 53 cm
f = 70.5 cm

Based on said sizes an exemplary embodiment of the hoist device was designed, the sizes of which are indicated by means of letters in the figures 2 and 3, wherein:

g = 20.3 cm
h = 30.9 cm
i = 10 cm
j = 28.9 cm
k = 29.5 cm
l = 12 cm
m = 27 cm
o = 69.9 cm
p = 18.7 cm
q = 18.2 cm

[0034] It is noted here that the embodiment of the in-

vention described above and its sizes are meant to be an illustration of the invention and are not meant to limit the invention. An expert will certainly be capable of designing alternative embodiments that fall within the scope of protection of the attached claims. It is furthermore observed that mainly the ratios between the sizes are of importance, for instance:

$h + i + k f$

or

$o-g \cdot c-b$

[0035] It will furthermore be clear that if the sizes of the average person change, the sizes of the hoist device according to the invention, particularly newly to be built hoist devices, will also have to be regularly adapted or updated.

[0036] Figure 4 shows a view in perspective of the hoist device 4 of figure 1 in position IV. This exemplary embodiment is provided with a suspension assembly 43 comprising connection means 431 for connecting the hoist device with a supporting jib or ceiling trolley. The connection means 431 are rotatably bearing mounted to the other parts of the suspension assembly 43, so that the connection means 431 are rotatable about a substantially vertical axis with respect to the bearing housing 432.

[0037] An electromotor 433 is placed at the bearing housing 432, which electromotor by means of a drive shaft 434 is coupled to a transmission 435 for driving the second arm members 42. The bearing housing 432, the electromotor 433, the drive shaft 434 and the transmission 435 are kept from view by a housing when the hoist device 4 is used normally. In said housing control means and/or energy storage means for the electromotor 433 can furthermore be placed. As a result a modular hoist device 4 is obtained that can be connected as one unity to a lift device or ceiling lift.

[0038] The first arm members 413, 414 are fixedly connected to the bearing housing 432. As shown in figure 4 the hoist device 4 is provided with two first arm members 413 and 414 placed parallel. Said first arm members 413, 414 comprise sideways extending sections 411, 412 for spacing the first arm members 413, 414 apart from each other. The distance of said sideways extending sections 411, 412 is selected such that the mutual distance between the first arm members 413, 414 exceeds the average person's shoulder width. In a further exemplary embodiment the length of the sideways extending sections 411, 412 is adjustable so that the mutual distance of the first arm members 413, 414 can be adapted to the shoulder width of the person requiring care.

[0039] As shown in figure 4 the second arm members 42 are annular or hoop-shaped. Said second arm members 42 are connected to the transmission 435. At a side across the transmission 435, said second arm members 42 are furthermore provided with a curved connection member 45.

Claims

1. Hoist device for moving a person from a recumbent to a sitting position, or vice versa, wherein the hoist device comprises a suspension assembly and first and second arm members extending in opposite direction for attaching a sling thereto, wherein the second arm members, intended for carrying the person's pelvic area, is rotatable about a substantially horizontal axis, and wherein the first arm members, intended for carrying the person's shoulder area, at least in a direction perpendicular to the axis, extend from the suspension assembly over a distance that exceeds the distance between an average person's shoulder and crown.
2. Hoist device according to claim 1, wherein the first arm members are rotation fixedly placed at the suspension assembly.
3. Hoist device according to claim 1 or 2, wherein the second arm members comprise a connection member that is placed thereon so as to hinge, wherein the connection member at an end thereof extending away from the second arm members is provided with attachment means for attaching the sling thereto, wherein the connection member preferably is curved.
4. Hoist device according to claim 1, 2 or 3, wherein the second arm members are rotatable for placing the hoist device in a first position for supporting the person in a sitting position and in a second position for supporting the person in a recumbent position, wherein the angle of rotation of the second arm members between the first position and the second position preferably exceeds 90°, preferably exceeds 120°, and wherein the second arm members preferably are rotatable over an angle of rotation exceeding the angle of rotation between the first and second position.
5. Hoist device according to any one of the preceding claims, wherein the hoist device comprises two first arm members that are placed substantially parallel and spaced apart, wherein the second arm members preferably comprise a substantially closed handle or hoop.
6. Hoist device according to any one of the preceding claims, wherein the hoist device comprises drive means for driving the second arm members, wherein the drive means preferably comprise an electromotor.
7. Lift device comprising a base, a post placed on the base, the post having a hoist device according to any one of the preceding claims.

8. Ceiling lift comprising a trolley to be placed in a ceiling rail and movable along said rail, the trolley having a hoist device according to any one of the claims 1-6.

5

9. Hoist device for moving a person from a recumbent to a sitting position, or vice versa, wherein the hoist device comprises a suspension assembly and first and second arm members extending in opposite direction from the suspension assembly for attaching a sling thereto, wherein the first and/or second arm members are rotatable about at least one substantially horizontal axis for placing the hoist device in a first position for supporting the person in a sitting position and in a second position for supporting the person in a recumbent position, wherein the first and/or second arm members are rotatable over an angle of rotation exceeding the angle of rotation between the first and the second position.

10

15

20

10. Method for moving a person by means of a hoist device from a recumbent to a sitting position, or vice versa, wherein the person is placed in a sling attached to the hoist device and wherein the hoist device is placeable in a first position for supporting the person in a sitting position and in a second position for supporting the person in a recumbent position, wherein the person during moving, at least temporarily, is lifted past the first and/or second position.

25

30

35

40

45

50

55

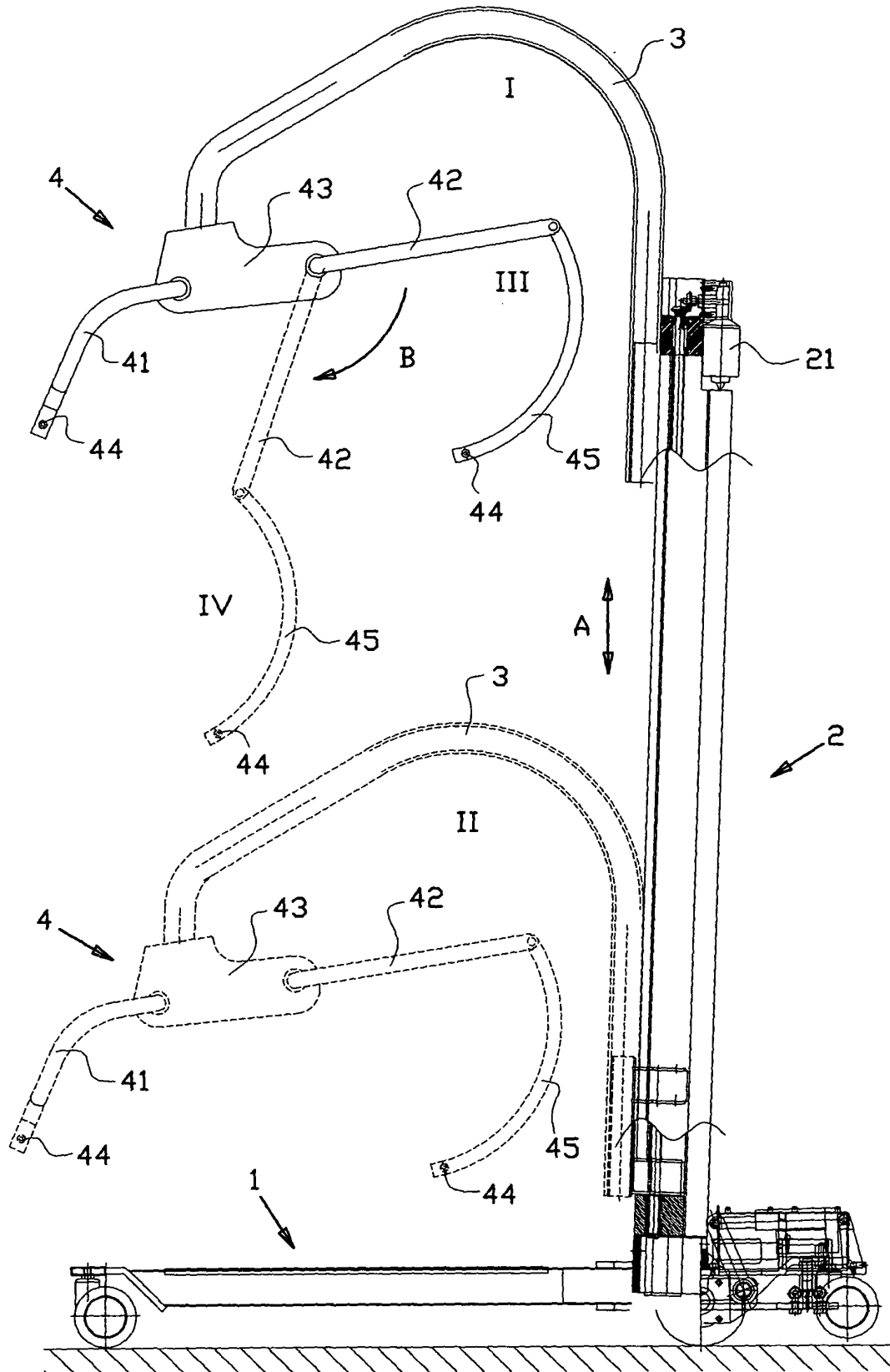


FIG. 1

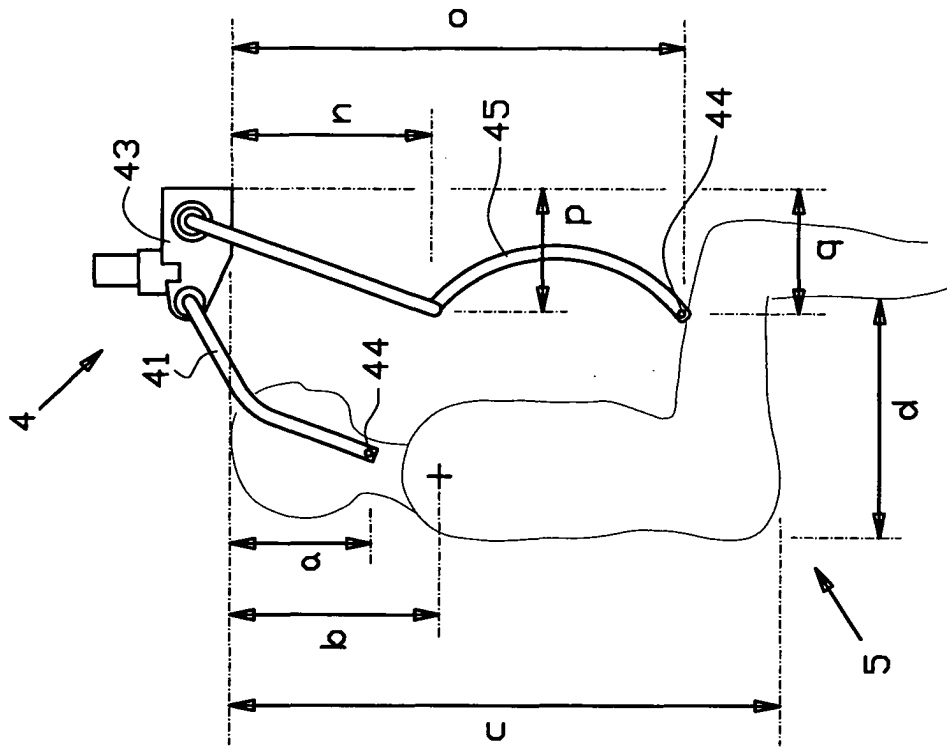


FIG. 2

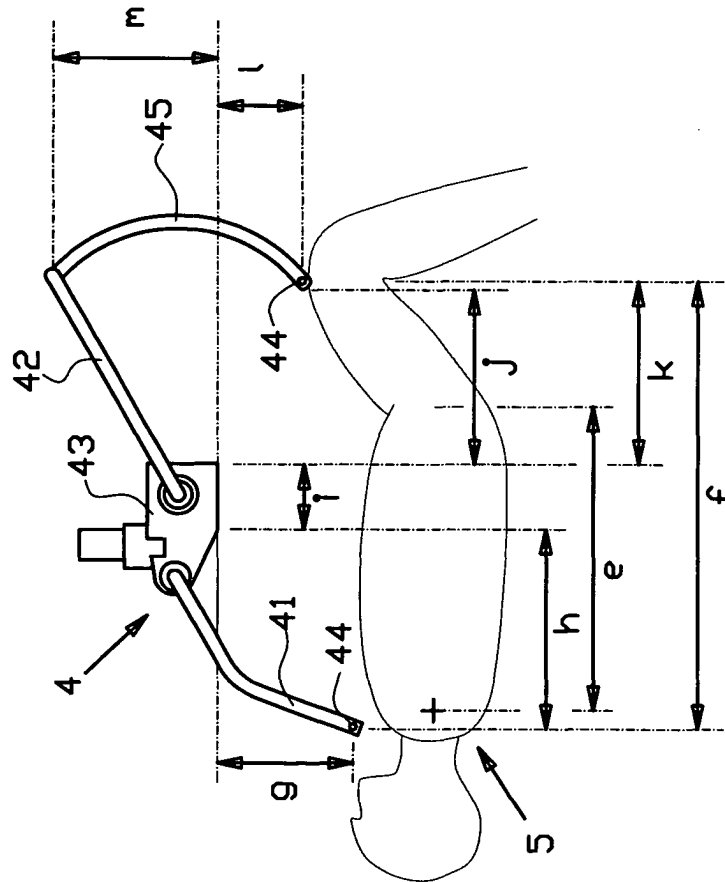


FIG. 3

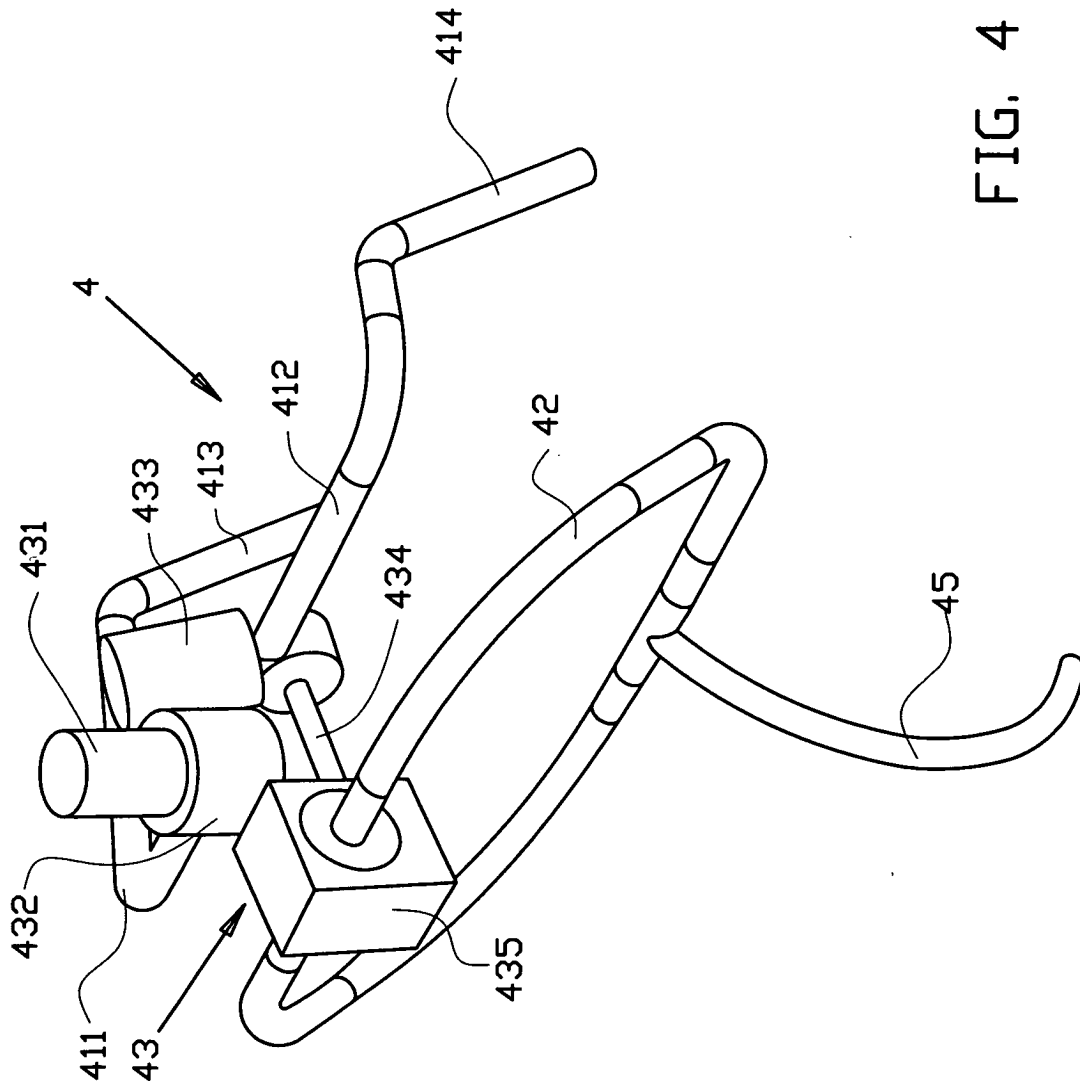


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 07 6087

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 94 19 518 U (HORCHER GMBH) 30 March 1995 (1995-03-30)	1,2,5-7	A61G7/10
Y		8	
A	* the whole document *	3,4,9,10	

Y	US 6 219 862 B1 (HORCHER WILLI ET AL) 24 April 2001 (2001-04-24) * column 5, line 9 - line 20; figure 9 *	8	

X	DE 295 19 119 U (CAREFLEX HOLDING BV) 28 March 1996 (1996-03-28)	1,5-7	
A	* the whole document *	4,9,10	

			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A61G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		1 August 2005	Baert, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (P04C01)

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

EP 05 07 6087

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-08-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 9419518	U	30-03-1995	DE 9402462 U1	29-09-1994
			DE 9419518 U1	30-03-1995
			CA 2164450 A1	07-06-1996
			DE 19514170 A1	20-06-1996
			DE 59501411 D1	12-03-1998
			DK 715841 T3	23-09-1998
			EP 0715841 A1	12-06-1996
			US 5649329 A	22-07-1997

US 6219862	B1	24-04-2001	DE 19820508 C1	23-09-1999
			GB 2337036 A ,B	10-11-1999
			NL 1011996 C2	01-02-2000
			NL 1011996 A1	09-11-1999

DE 29519119	U	28-03-1996	NL 9402027 A	01-07-1996
			BE 1009019 A3	01-10-1996
			DE 29519119 U1	28-03-1996
			FR 2727622 A3	07-06-1996
			GB 2295602 A ,B	05-06-1996
