(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 436 355 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.04.2012 Bulletin 2012/14

(51) Int Cl.:
A61G 7/10 *(2006.01)*

(21) Application number: **10181923.3**

(22) Date of filing: **29.09.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

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(54) A device for supporting a human body during lifting operations

(57) A device (1) for supporting a human body (2) during lifting operations is disclosed. The device (1) comprises a first main strap (3) and a second main strap (4) being attached to each other at an attachment position (5), in such a manner that the first main strap (3) and the second main strap (4) cross each other, an angle thereby being defined between the first main strap (3) and the second main strap (4) at the attachment position (5). The device (1) further comprises a first transverse strap (6) and a second transverse strap (8). The first transverse strap (6) is attached to the first main strap (3) and to the second main strap (4) at a first distance to the attachment position (5), in such a manner that a first substantially isosceles triangle (7) is defined. The second transverse strap (8) is attached to the first main strap (3) and to the second main strap (4) at a second distance to the attachment position (5), in such a manner that a second substantially isosceles triangle (9) is defined. The attachment position (5) is arranged between the first transverse strap (6) and the second transverse strap (8).

Since the device (1) is made from strap material, the amount of material of the device (1) is minimised, thereby reducing the friction between the device (1) and clothes worn by a person (2) to be lifted, thereby allowing the device (1) to be easily positioned and removed beneath the person (2). However, the transverse straps (6, 8) and the crossing of the main straps (3, 4) ensure that the person (2) is firmly supported and prevent that the person slides relatively to the device (1). As a consequence, the device (1) allows existing hoisting equipment to be used for lifting deceased persons from a bed to a coffin (13).

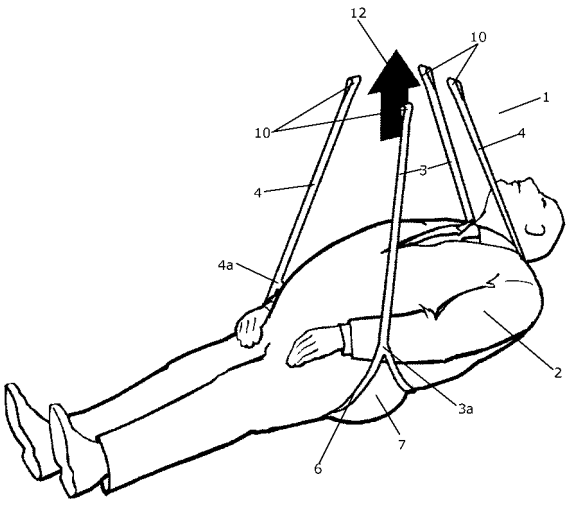


Fig. 3

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a device for supporting a human body during lifting operations. More particularly, the device of the invention is designed for aiding undertakers when moving deceased persons from a bed to a coffin.

BACKGROUND OF THE INVENTION

[0002] Elderly or disabled persons are often walking-impaired or have difficulties in getting in an out of bed. In order to allow nursing staff or care assistants to help such persons in and out of bed, in and out of a wheelchair, etc., lifting equipment is sometimes provided. Typical lifting equipment for this purpose includes a lift, either fixedly mounted on the ceiling, e.g. in a position in the vicinity of a bed, or in the form of a movable lift being capable of moving the person form one location in the flat to another. Furthermore, the lifting equipment comprises a lifting harness or the like. When a person is to be moved by means of the lifting equipment, the lifting harness is arranged around the person and/or the person is made to 'wear' the lifting harness. The lifting harness is then attached to the lift, and the person is lifted by means of the lift, while hanging in the lifting harness in a sitting or a lying position.

[0003] Existing lifting harnesses are designed for lifting and moving living persons. Therefore they are designed in a manner which ensures the comfort of the person being lifted. Furthermore, some lifting harnesses are designed for special purposes, such as lifting persons in a sitting position, lifting persons in a lying position or allowing persons to use the bathroom while hanging in the lifting harness. As a consequence, existing lifting harnesses are often made with a large area of fabric, e.g. in the form of a 'cloth' or a 'sail' arranged to support the body of the person being lifted.

[0004] When people pass away in their homes or in a nursing facility, it is desirable for the undertaker to use the existing lifting equipment, if such is installed in the home or nursing facility, for lifting the deceased person from the bed to a coffin, because it can thereby be avoided that the undertaker has to lift the deceased person manually, thereby risking back injury or other similar injuries. However, the existing lifting harnesses are not very well suited, because it is difficult to arrange the harness under a person lying in a bed without the person being able to move slightly, thereby helping the personnel positioning the harness in an appropriate manner. Furthermore, once the deceased person has been positioned in the coffin, lack of space between the person and the walls of the coffin makes it difficult to remove the harness. As a consequence, the existing lifting equipment is seldom used, and the deceased persons are instead lifted manually from the bed to the coffin.

[0005] US 7,624,458 B2 discloses an example of an existing lifting harness in the form of a personal transport device comprising a back support and two leg flaps extending from a bottom edge of the back support. The leg flaps are configured to cross under and support a thigh region of a person.

DESCRIPTION OF THE INVENTION

[0006] It is an object of embodiments of the invention to provide a device for supporting a human body during lifting operations, the device allowing existing lifting equipment to be used for lifting deceased persons.

[0007] According to the invention there is provided a device for supporting a human body during lifting operations, the device comprising:

- a first main strap and a second main strap, the first main strap and the second main strap being attached to each other at an attachment position, in such a manner that the first main strap and the second main strap cross each other, an angle thereby being defined between the first main strap and the second main strap at the attachment position,
- a first transverse strap attached to the first main strap and to the second main strap at a first distance to the attachment position, in such a manner that a first substantially isosceles triangle is defined by the first transverse strap and the parts of the first main strap and the second main strap which interconnect the attachment position and the points of attachment between the first transverse strap and the first main strap and the second main strap, respectively,
- a second transverse strap attached to the first main strap and to the second main strap at a second distance to the attachment position, in such a manner that a second substantially isosceles triangle is defined by the second transverse strap and the parts of the first main strap and the second main strap which interconnect the attachment position and the points of attachment between the second transverse strap and the first main strap and the second main strap, respectively,

wherein the attachment position is arranged between the first transverse strap and the second transverse strap.

[0008] The device according to the invention is adapted to support a human body while said body is being lifted. This is similar to the prior art lifting harnesses described above. The device of the invention may be used for supporting living persons in need of assistance during movement, e.g. walking-impaired persons. However, the device of the invention is particularly suitable for supporting the body of a deceased person during lifting operations, e.g. from a bed to a coffin. This will be explained further below.

[0009] The device comprises a first main strap and a second main strap. In the present context the term 'strap' should be interpreted to mean an item which has a length which is significantly longer than a width of the item, i.e. the strap has the shape of a band or a tape.

[0010] The first main strap and the second main strap are attached to each other at an attachment position. Accordingly, the first main strap and the second main strap are fixed relatively to each other at the attachment position, e.g. by means of stitching and/or by means of a suitable adhesive, such as glue. Furthermore, the first main strap and the second main strap are attached to each other in such a manner that they cross each other, and in such a manner that an angle is defined between the main straps at the attachment position. This should be interpreted to mean that the main straps form an 'X' at the attachment position, the main straps extending diagonally away from the attachment position.

[0011] The device further comprises a first transverse strap and a second transverse strap. The first transverse strap is attached to the first main strap and the second main strap at a first distance to the attachment position. Thus, the first main strap interconnects the first main strap and the second main strap, and the distance from the attachment position to the position where the first transverse strap is attached to the first main strap, along the first main strap, is equal to the distance from the attachment position to the position where the first transverse strap is attached to the second main strap, along the second main strap. Thereby a part of the first main strap, a part of the second main strap and the first transverse strap form a first substantially isosceles triangle with its top angle arranged at the attachment position.

[0012] Similarly, the second transverse strap is attached to the first main strap and the second main strap at a second distance to the attachment position. Thus, the second main strap interconnects the first main strap and the second main strap, and the distance from the attachment position to the position where the second transverse strap is attached to the first main strap, along the first main strap, is equal to the distance from the attachment position to the position where the second transverse strap is attached to the second main strap, along the second main strap. Thereby a part of the first main strap, a part of the second main strap and the second transverse strap form a second substantially isosceles triangle with its top angle arranged at the attachment position.

[0013] The first transverse strap and the second transverse strap may, e.g., be attached to the first and second main straps by means of stitching and/or using a suitable adhesive or glue.

[0014] The attachment position is arranged between the first transverse strap and the second transverse strap. Thereby the first isosceles triangle and the second isosceles triangle are arranged with their top angles abutting each other at the attachment position, and with the sides formed by the first transverse strap and the second transverse strap, respectively, arranged opposite each other. Thereby the first and second isosceles triangles can each provide separate and firm support for a part of a human body being lifted by means of the device. Accordingly, the body is well supported without requiring a large 'cloth' or 'sail'. Furthermore, using straps instead of a 'cloth' or 'sail', minimises the amount of material of the device. Thereby the friction between the material of the device and clothes of the person being lifted is minimised, thereby making it possible to pull the device away from under the person. Furthermore, it makes it easier to position the device under a person in a lying position. Thereby the device of the invention is very suitable for moving deceased persons from a bed to a coffin, since it is possible to pull the device away from under the person, regardless of the narrow available space of the coffin. Thus, it is possible for the undertaker to utilise existing lifting equipment being available in the home of the deceased, thereby avoiding the risk of back injury, etc.

[0015] The side of the first isosceles triangle which is formed by the first transverse strap may be longer than the side of the second isosceles triangle which is formed by the second transverse strap. According to this embodiment, the device is designed in a manner which allows various parts of the human body, the parts having various dimensions, to be supported by means of the first and second isosceles triangle, respectively.

[0016] The first transverse strap may be adapted to support a buttocks or upper thigh region of a human body being lifted by means of the device, and the second transverse strap may be adapted to support a shoulder region of a human body being lifted by means of the device. According to this embodiment, when the device is in use, the first, longer transverse strap is arranged at a buttocks or upper thigh region of the person to be lifted, the second, shorter transverse strap is arranged at a shoulder region of the person, and the attachment position, where the first main strap and the second main strap cross each other, is arranged at a back region of the person. Thus, the lower part of the back and the buttocks will be accommodated in and supported by the first isosceles triangle, while the upper part of the back and the shoulder region will be accommodated in and supported by the second isosceles triangle. This provides a firm support for the body, ensuring stability during the lifting operation. The first, longer transverse strap allows the buttocks to be enclosed by the first isosceles triangle, i.e. the sides of the first isosceles triangle which are formed by the first and second main straps preferably support the sides of the thighs of the person being lifted during use of the device. The second, shorter transverse strap ensures that the upper part of the back and the shoulders are supported by the sides of the second isosceles triangle, i.e. the points of attachment between the second transverse strap and the first main strap and the second main strap, respectively, are preferably arranged at the shoulder region, i.e. these points preferably form support points for the shoulder region of the person being lifted

during use of the device.

[0017] The first distance may be substantially equal to the second distance. According to this embodiment, the attachment position, i.e. the position where the first main strap and the second main strap cross each other, is arranged halfway between the first transverse strap and the second transverse strap. This allows the attachment position to be positioned in a centre region of the back of a person being lifted by means of the device, each of the isosceles triangles thereby supporting approximately half of the torso of the person. This provides a very stabile supporting device, sideways as well as lengthwise, thereby reducing the risk that the person slides relatively to the device during lifting operations.

[0018] The first distance and/or the second distance may be within the interval 20 cm to 60 cm, such as within the interval 30 cm to 50 cm, such as approximately 40 cm.

[0019] The side of the first isosceles triangle which is formed by the first transverse strap may have a length which is within the interval 50 cm to 70 cm, such as within the interval 55 cm to 65 cm, such as approximately 60 cm.

[0020] Alternatively or additionally, the side of the second isosceles triangle which is formed by the second transverse strap may have a length which is within the interval 20 cm to 30 cm, such as within the interval 22 cm to 28 cm, such as approximately 26 cm.

[0021] At least the first main strap and the second main strap may have widths within the interval 20 mm to 40 mm, such as within the interval 25 mm to 37 mm, such as approximately 32 mm. According to this embodiment, the main straps are very narrow as compared to their lengths. Thereby the amount of material used for the device is minimised, thereby minimising the friction between the material of the device and fabric of the clothes worn by the person being lifted, as described above.

[0022] Preferably, the transverse straps also have widths within the interval 20 mm to 40 mm, such as within the interval 25 mm to 37 mm, such as approximately 32 mm. All of the straps may advantageously be made from the same kind of strap material, cut to appropriate lengths for each of the straps.

[0023] The first main strap and the second main strap may each comprise a first and a second end part, and each of the end parts may be adapted to be connected to a hoisting apparatus. According to this embodiment, the end parts of the first and second main straps may easily be connected to the hoisting apparatus when the device has been arranged around the person. The device, along with the person, is then lifted by means of the hoisting apparatus. The hoisting apparatus may advantageously be of the kind which is normally used for lifting walking-impaired, disabled or elderly persons in their homes or in nursing facilities, as described above. Accordingly, the device of the invention allows such hoisting equipment to be used for moving deceased persons from a bed to a coffin.

[0024] At least the first main strap and the second main strap may be made from a polyester material. Polyester materials are normally washable, and it is very desirable to make the device of the invention from a washable material. Furthermore, many polyester materials have a very smooth surface. This even further reduces the friction between the device and clothes worn by the person being lifted. For instance, the straps may be made from polyester sling webbing, e.g. of a kind which is supplied by Marling Leek Ltd. A smooth surface of the straps may, e.g., be obtained by applying a suitable coating to the straps.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] The invention will now be described in further detail with reference to the accompanying drawings in which

Fig. 1 is an illustration of a device according to an embodiment of the invention, arranged beneath a person to be lifted,

Fig. 2 is a perspective view of a person to be lifted by means of the device of Fig. 1, while the device is being arranged beneath the person,

Fig. 3 is a perspective view of a person being lifted by means of the device of Fig. 1, and

Fig. 4 is a perspective view of a person having been moved to a coffin by means of the device of Fig. 1.

DETAILED DESCRIPTION OF THE DRAWINGS

[0026] Fig. 1 illustrates a device 1 according to an embodiment of the invention. The device 1 is arranged beneath a person 2 to be lifted by means of the device 1, the person 2 being schematically illustrated.

[0027] The device 1 comprises a first main strap 3 and a second main strap 4. The first main strap 3 and the second main strap 4 are attached to each other at an attachment position 5 in such a manner that the first main strap 3 and the second main strap 4 cross each other at the attachment position 5.

[0028] A first transverse strap 6 is attached to the first main strap 3 and the second main strap 4, thereby interconnecting the main straps 3, 4, at a first distance from the attachment position 5. Thereby a first isosceles triangle 7 is formed by the first transverse strap 6 and the sections of the first main strap 3 and the second main strap 4 which interconnect the attachment portion 5 and the points 3a, 4a where the main straps 3, 4 are attached to the first transverse strap 6.

[0029] A second transverse strap 8 is attached to the first main strap 3 and the second main strap 4, thereby interconnecting the main straps 3, 4, at a second distance from the attachment position 5. Thereby a second isosceles triangle 9 is formed by the second transverse strap 8 and the sections of the first main strap 3 and the second

main strap 4 which interconnect the attachment portion 5 and the points 3b, 4b where the main straps 3, 4 are attached to the second transverse strap 8.

[0030] The first isosceles triangle 7 is arranged in such a manner that the first transverse strap 6 supports the upper thigh region of the person 2 to be lifted by means of the device 1, and in such a manner that the buttocks region of the person 2 is accommodated in the first isosceles triangle 7. Thereby the buttocks region of the person 2 is firmly supported by the device 1, and it is prevented that the person 2 slides relatively to the device 1 during lifting operations.

[0031] The second isosceles triangle 9 is arranged in such a manner that the second transverse strap 8 supports a shoulder region of the person 2 to be lifted by means of the device 1, and in such a manner that the upper region of the back of the person 2 is supported by the main straps 3, 4. This also provides firm support for the person 2 being lifted and prevents that the shoulder region of the person 2 slides during lifting operations.

[0032] The length of the first transverse strap 6 is selected to be sufficiently long to ensure that the buttocks region of the person 2 is completely accommodated within the first isosceles triangle, i.e. the attachment positions 3a, 4a are arranged besides the person 2. The length of the second transverse strap 8 is selected to be sufficiently short to ensure that the shoulder region of the person 2 is supported, i.e. the attachment positions 3b, 4b are arranged in contact with the person 2. In order to obtain this, the first transverse strap 6 is longer than the second transverse strap 8.

[0033] Furthermore, the arrangement of the attachment position 5, i.e. the position where the first main strap 3 and the second main strap 4 cross each other, at a centre region of the back of the person 2 to be lifted ensures that the person 2 is stabilized transversely, i.e. the person 2 is prevented from sliding in a sideways direction.

[0034] It is an advantage that the device 1 is made entirely from straps 3, 4, 6, 8 interconnected in a suitable manner, since this minimises the amount of material of the device 1. Thereby the friction between the material of the device 1 and clothes worn by the person 2 to be lifted is minimised, thereby making it easier to position the device 1 as well as pulling it out from beneath the person 2 when the lifting operation has been completed. This makes the device 1 of the invention very suitable for lifting deceased persons from a bed to a coffin, as will be explained in further detail below.

[0035] Four loops 10 are formed at end parts of the first main strap 3 and the second main strap 4. The loops 10 allow the main straps 3, 4 to be connected to a hoisting apparatus, e.g. of the kind which is normally used for lifting walking-impaired, disabled or elderly persons in their homes or in nursing facilities. Accordingly, such equipment can be used for lifting deceased persons from a bed to a coffin when the device 1 of the invention is applied.

[0036] Fig. 2 is a perspective view of a person 2 in the process of being arranged on top of the device 1 of Fig. 1. It can be seen from Fig. 2 that the person 2 is easily rolled onto the device 1, as indicated by arrow 11, due to the reduced amount of material of the device 1.

[0037] Fig. 3 is a perspective view of a person 2 being lifted by means of the device 1 of Fig. 1. It should be understood that the loops 10 are connected to a hoisting apparatus (not shown) which performs the actual lifting, i.e. moves the device 1 along with the person 2 in the direction indicated by arrow 12.

[0038] From Fig. 3 it is clear that the buttock region of the person 2 is entirely accommodated by the first isosceles triangle 7. It is also clear from Fig. 3 that this provides a very firm support for this region, preventing it from sliding relatively to the device 1 in a longitudinal as well as a transverse direction.

[0039] Furthermore, it is clear that the position of the second isosceles triangle (not visible in Fig. 3) ensures that the first main strap 3 and the second main strap 4 are arranged on either side of the neck of the person 2, thereby firmly supporting the upper shoulder region and the neck region of the person 2. As a consequence, the entire torso part of the person 2 is very well supported, and the person 2 is prevented from sliding relatively to the device 1 during lifting operations.

[0040] Fig. 4 is a perspective view of a person 2 having been moved to a coffin 13 by means of the device 1 of Fig. 1. It is clear from Fig. 4 that the available space between the person 2 and the walls of the coffin 13 is very limited. However, since the device 1 is made entirely from straps 3, 4, 6, 8 as described above, the friction between the device 1 and the clothes of the person 2 is minimised, thereby allowing the device 1 to be pulled away from beneath the person 2 lying in the coffin 13 as indicated in Fig. 4, without rotating the person 2 or moving the person 2 sideways. This will be even easier if the straps 3, 4, 6, 8 are made from a material with a smooth surface, as described above.

Claims

1. A device for supporting a human body during lifting operations, the device comprising:

   - a first main strap and a second main strap, the first main strap and the second main strap being attached to each other at an attachment position, in such a manner that the first main strap and the second main strap cross each other, an angle thereby being defined between the first main strap and the second main strap at the attachment position,
   - a first transverse strap attached to the first main strap and to the second main strap at a first distance to the attachment position, in such a manner that a first substantially isosceles triangle is defined by the first transverse strap and the parts

of the first main strap and the second main strap which interconnect the attachment position and the points of attachment between the first transverse strap and the first main strap and the second main strap, respectively,
- a second transverse strap attached to the first main strap and to the second main strap at a second distance to the attachment position, in such a manner that a second substantially isosceles triangle is defined by the second transverse strap and the parts of the first main strap and the second main strap which interconnect the attachment position and the points of attachment between the second transverse strap and the first main strap and the second main strap, respectively,

wherein the attachment position is arranged between the first transverse strap and the second transverse strap.

2. A device according to claim 1, wherein the side of the first isosceles triangle which is formed by the first transverse strap is longer than the side of the second isosceles triangle which is formed by the second transverse strap.

3. A device according to claim 2, wherein the first transverse strap is adapted to support a buttocks or upper thigh region of a human body being lifted by means of the device, and wherein the second transverse strap is adapted to support a shoulder region of a human body being lifted by means of the device.

4. A device according to any of the preceding claims, wherein the first distance is substantially equal to the second distance.

5. A device according to any of the preceding claims, wherein the first distance and/or the second distance is/are within the interval 20 cm to 60 cm.

6. A device according to any of the preceding claims, wherein the side of the first isosceles triangle which is formed by the first transverse strap has a length which is within the interval 50 cm to 70 cm.

7. A device according to any of the preceding claims, wherein the side of the second isosceles triangle which is formed by the second transverse strap has a length which is within the interval 20 cm to 30 cm.

8. A device according to any of the preceding claims, wherein at least the first main strap and the second main strap have widths within the interval 20 mm to 40 mm.

9. A device according to any of the preceding claims, wherein the first main strap and the second main strap each comprises a first and a second end part, and wherein each of the end parts is adapted to be connected to a hoisting apparatus.

10. A device according to any of the preceding claims, wherein at least the first main strap and the second main strap are made from a polyester material.

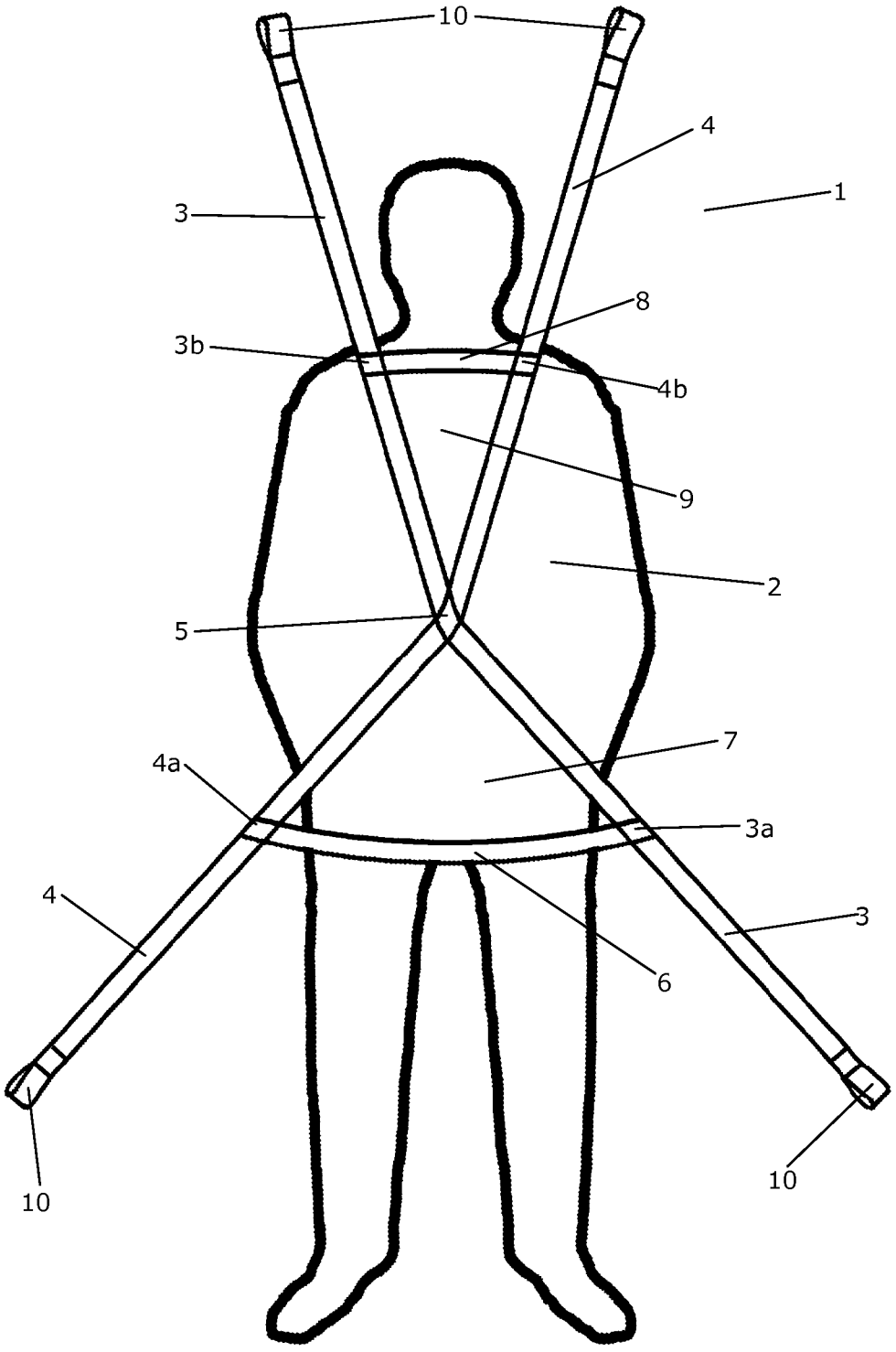


Fig. 1

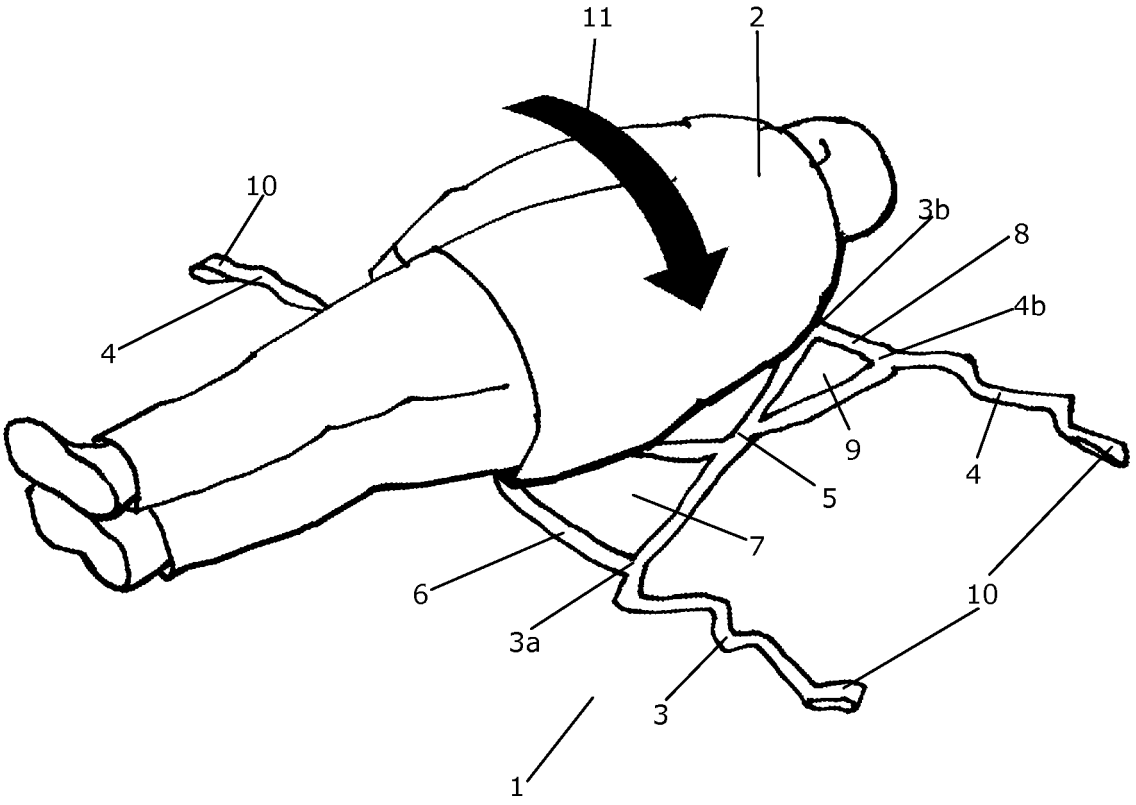


Fig. 2

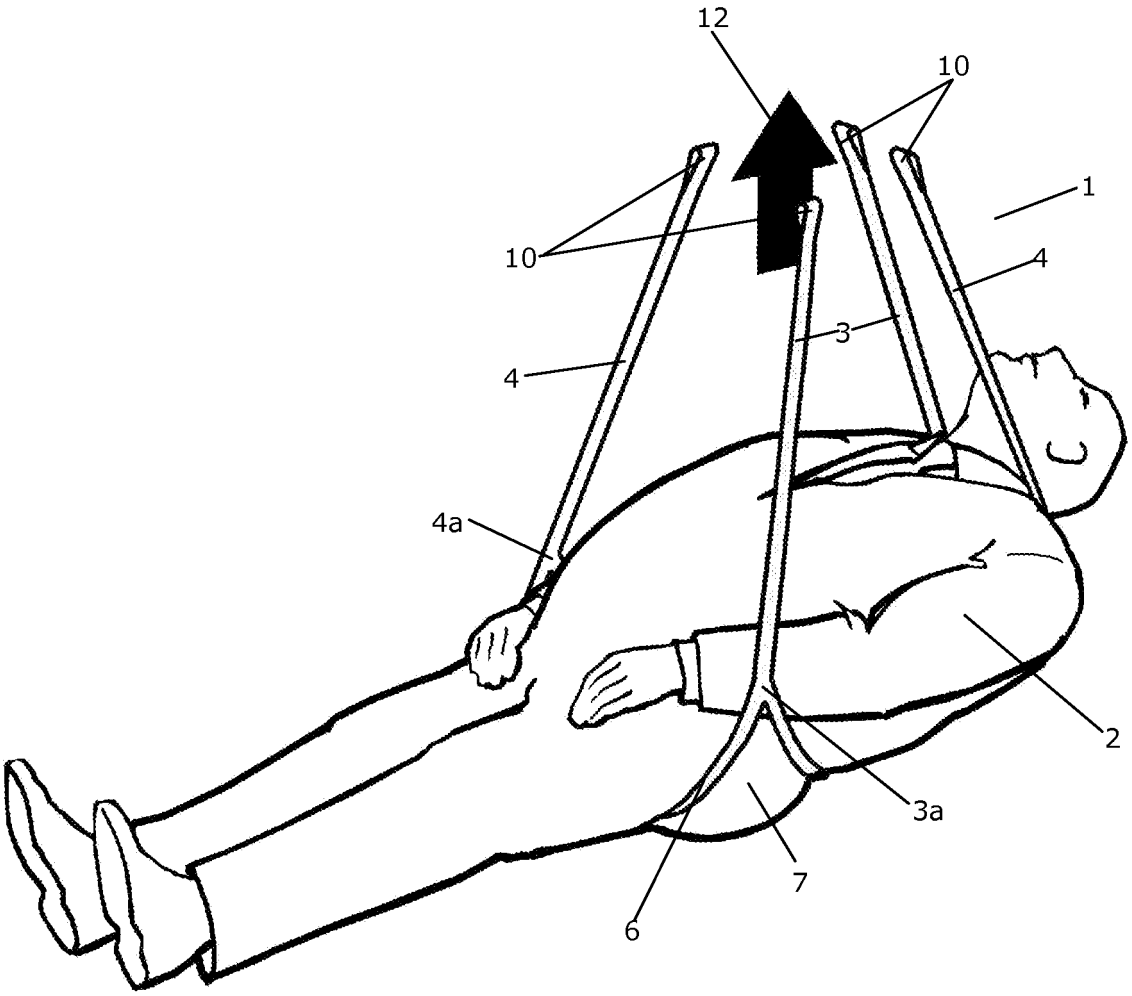


Fig. 3

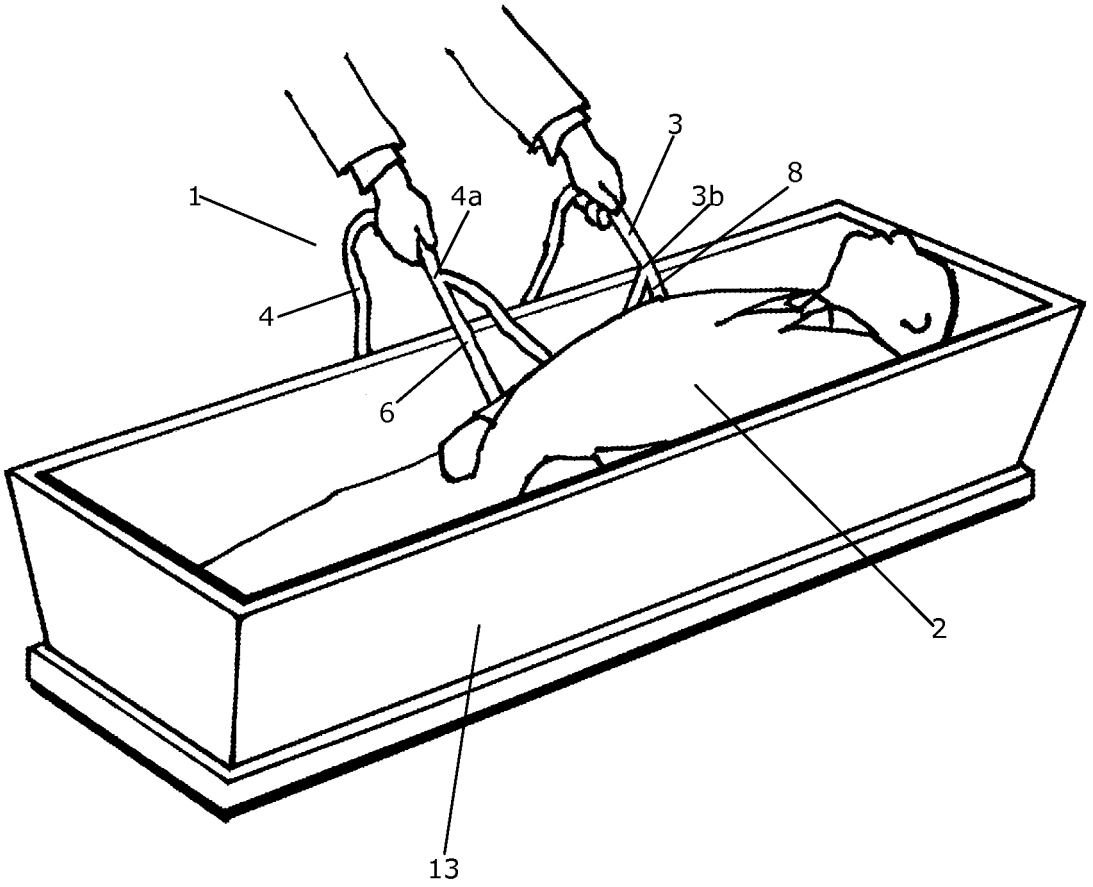


Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 10 18 1923

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2006/289573 A1 (MANTUANO VIVENCIO L JR [US] ET AL) 28 December 2006 (2006-12-28) * claims 1, 2 * * figures 1, 2 * -----	1-10	INV. A61G7/10

TECHNICAL FIELDS SEARCHED (IPC)

A61G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 February 2011	Ong, Hong Djien

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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D : document cited in the application
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 18 1923

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08-02-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006289573 A1	28-12-2006	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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