

(19)



(11)

**EP 4 215 171 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**26.07.2023 Bulletin 2023/30**

(51) International Patent Classification (IPC):  
**A61G 7/10 (2006.01)**

(21) Application number: **23153120.3**

(52) Cooperative Patent Classification (CPC):  
**A61G 7/1001; A61G 7/1088; A61G 7/1046;  
A61G 7/1057; A61G 2200/36**

(22) Date of filing: **24.01.2023**

(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 ME MK MT NL  
NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA**  
Designated Validation States:  
**KH MA MD TN**

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(30) Priority: **25.01.2022 PL 44021622**

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(54) **A STANDING FRAME AND A BACK SUPPORT FOR A STANDING FRAME**

(57) A back support for a standing frame, the back support (30) comprising: a holder (31) for attaching the back support (30) to the standing frame, the holder (31) having a ball stud (32) at its one end; a supporting plate (35); a carrying plate (34) attached at a first side of the supporting plate (35) and having a socket (33) housing a ball of the ball stud (32); a cushion (36) attached at a second side of the supporting plate (35); and hip supports

(40, 50) mounted asides the supporting plate (35), each hip support (40, 50) being mounted on a bracket (41, 51), each bracket (41, 51) having an elongated arm (41A, 51A) parallel to the supporting plate (35) and rotatable relative to an axis (X1, X2) perpendicular to the supporting plate (35), wherein each hip support (40, 50) has a main plane (40A, 50A) arranged perpendicularly to its elongated arm (41A, 51A).

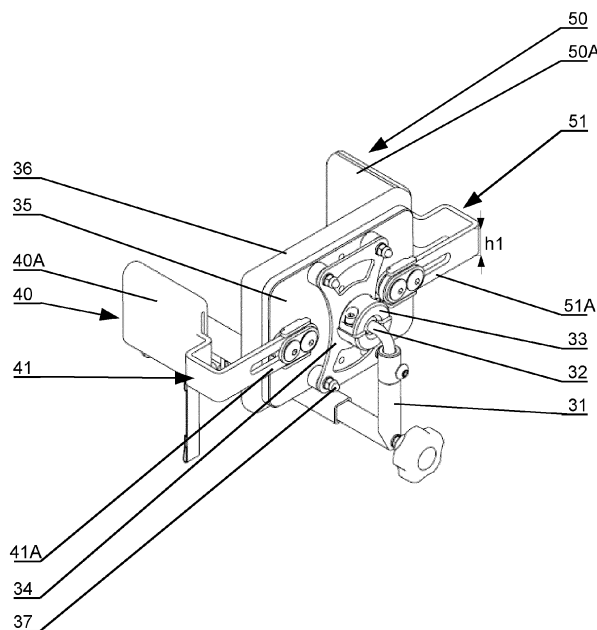


Fig. 2

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## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to standing frames, in particular to a back support for a standing frame.

### BACKGROUND

**[0002]** A standing frame (also called a stander) is a device that facilitates transitioning a disabled person from a horizontal position to a vertical position and vice versa and maintaining a disabled person in an upright position. There are known standing frames of various structures.

**[0003]** For example, US2010007180 discloses a standing frame with supine mode, comprising a frame, a backrest assembly including a pivot bracket, a seat assembly pivotably connected to the pivot bracket and the frame, a leg rest assembly pivotably connected to the frame, a link connected to the leg rest assembly at a first pivot joint and the pivot bracket at a second pivot joint, and a lock connected to the leg rest assembly and the frame.

### SUMMARY OF THE INVENTION

**[0004]** There is a need to develop a new structure of a standing frame to facilitate the use of the standing frame; in particular, to allow precise control of a person's position in the standing frame.

**[0005]** In one aspect, the invention relates to a back support for a standing frame, the back support comprising: a holder for attaching the back support to the standing frame, the holder having a ball stud at its one end; a supporting plate; a carrying plate attached at a first side of the supporting plate and having a socket housing a ball of the ball stud; a cushion attached at a second side of the supporting plate; and hip supports mounted asides the supporting plate. Each hip support is mounted on a bracket, each bracket having an elongated arm parallel to the supporting plate and rotatable relative to an axis perpendicular to the supporting plate. Each hip support has a main plane arranged perpendicularly to its elongated arm.

**[0006]** The use of a ball joint (comprising a ball of the ball stud placed in the socket) between the carrying plate and the holder facilitates adjustment of the back support in all planes so that it can be tilted at any desired angle. In particular, the back support mounted on the ball joint allows precise correction of improper positioning of the pelvis. The ball joint allows for correcting excessive pelvis anteversion or retroversion in the sagittal plane. Furthermore, the ball joint allows to correct the rotation of the pelvis in the coronal plane, which facilitates the correct positioning of a person in the standing frame. Furthermore, the correction of the pelvis is facilitated by the use of the hip supports that can be rotated - they prevent the

sideways displacement of the pelvis and provide support and stabilization while assuming the vertical position in abduction. Therefore, the ability to arrange the hip supports at a desired angle relative to the supporting plate enables correction, stabilization, and proper support of a person while assuming vertical position.

**[0007]** The elongated arm of each bracket may have an elongated opening, and the hip support is attached to the supporting plate by bolts passing through the elongated opening into holes in the supporting plate, wherein the holes located further from a side edge of the supporting plate have a shape of a sector of a circle. Thereby, it is possible to arrange the main planes of the hip supports at a desired angle of abduction.

**[0008]** The elongated opening may have a length greater than a distance between the holes at a particular side edge of the supporting plate. Thereby, it is possible to adjust the spacing of the hip supports to a desired width, in other words, to a position wherein the planes of the hip cushions are located closer to each other, or to a position wherein the planes of the hip cushions are located further away from each other. Therefore, it is possible to move the hip supports towards and away from each other, to adjust their distance to the width of the torso of the person using the standing frame.

**[0009]** Each hip support can be connected to the elongated arm of the bracket by means of a U-shaped bracket having a first arm connected to the hip support and a second arm forming an extension of the elongated arm of the bracket. This makes the solution universal since it enables stabilization within a wide range.

**[0010]** Each hole in the shape of a sector of a circle may have a length configured to allow rotary movement of the bracket around the axis of the other hole with a range of up to 30 degrees. This enables moving the hip supports within the limits of the useful range, without the risk of their displacement into an undesired position.

**[0011]** The back support may further comprise elongated washers between each bracket of the hip support and the supporting plate, the elongated washers having a U-shaped cross-section with arms distanced more than the width of the bracket, such that the bracket is located between said arms. Using the U-shaped washers allows to attach the brackets of the hip supports rigidly to the supporting plate, wherein the bolts are prevented from spontaneous loosening due to the patient's movements subjecting variable force on the hip supports.

**[0012]** In another aspect, the invention also relates to a standing frame comprising the back support as described herein.

### BRIEF DESCRIPTION OF DRAWINGS

**[0013]** The invention is shown by means of example embodiments on a drawing, wherein:

Fig. 1A shows the standing frame with the back support according to an embodiment of the invention,

arranged in a vertical position;

Fig. 1B shows the standing frame with the back support according to an embodiment of the invention, arranged in a horizontal position;

Fig. 2 shows the back support with the hip supports;

Fig. 3 shows the back support;

Fig. 4 shows the back support with the hip supports arranged;

Figs. 5A and 5B show the hip supports.

#### DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

**[0014]** Figs. 1A and 1B show an example embodiment of a standing frame with a back support according to an embodiment of the invention, in a vertical and horizontal position, respectively. The standing frame has a base 10 with a vertical column 20, to which there are attached supports for keeping a person in an upright position. A chest support 21 is attached to the column 20 in its upper part; below are attached a hip support 22 and knee supports 23, 24. At the bottom, the column 20 has footrests 25, 26. The base 10 has wheels 11 that enable movement of the standing frame. The structure of the standing frame presented herein is merely an example; the back support according to the invention can also be used with other types of standing frames with features similar to the embodiment presented herein.

**[0015]** The back support 30 (which can also be called a back pad or a back pelotte), is shown by means of a detailed embodiment in Figs. 2-4. The back support 30 is attached to the standing frame by means of a holder 31 having a ball stud 32 at its one end and attachable at its other end to a socket 27 in the standing frame.

**[0016]** The back support 30 has a carrying plate 34 and a supporting plate 35. The carrying plate 34 is attached at a first side of the supporting plate 35 and has a socket 33 housing a ball of the ball stud 32. A cushion 36 is attached at an opposite side of the supporting plate 35. The carrying plate 34 is attached to the supporting plate 35 by means of fixing bolts 37.

**[0017]** Besides the supporting plate 35 there are mounted hip supports 40, 50 which can also be referred to as side pads or pelottes. Each of the hip supports 40, 50 is attached on a bracket 41, 51 having an elongated arm 41A, 51A parallel to the supporting plate 35 and rotatable relative to an axis X1, X2 perpendicular to the supporting plate 35. Each hip support 40, 50 has a main plane 40A, 50A arranged perpendicularly to its elongated arm 41A, 51A.

**[0018]** The elongated arm 41A, 51A of each bracket 41, 51 has an elongated opening 42, 52. The hip support 40, 50 is attached to the supporting plate 35 by bolts 44, 45, 54, 55 passing through the elongated opening 42, 52 into holes 61, 62, 63, 64 in the supporting plate 35. In this example embodiment, the elongated opening 42, 52 has a length greater than the distance between the holes 61, 62 and 63, 64 at a given side 35A, 35B of the sup-

porting plate 35. The holes 62, 64 located further from the edge of the side 35A, 35B of the supporting plate 35 have a shape of a sector of a circle, and they have such a length that enables rotary movement of the brackets 41, 51 around the axes of the holes 61, 63 within a range of up to 30 degrees. Such shaped holes 62, 64 enable rotation of the elongated arm 41A, 51A of the bracket along the sector of the circle whose axis X1, X2 is located in the place of the holes 61, 62 located closer to the edge of the side 35A, 35B.

**[0019]** To set the hip support 40, 50 at an oblique angle, the user must loosen the bolts 44, 45, 54, 55 and rotate the bracket 41, 51 of the hip support 40, 50 relative to the axis of the bolt 44, 54. Then, the bolt 45, 55 can move along the hole 62, 64. Upon setting the hip support 40, 50 in the desired position, the user must tighten the bolts 44, 45, 54, 55.

**[0020]** The hip supports 40, 50 are preferably connected to the elongated arm 41A, 51A of the bracket 41, 51 by means of U-shaped brackets 70, 80, having a first arm 71, 81 connected to the hip support 40, 50, and a second arm 72, 82 that forms an extension of the elongated arm 41A, 51A of the bracket 41, 51. The use of the U-shaped brackets 70, 80 enables such arrangement of the hip supports 40, 50 in which the arms 71, 72; 81, 82 of the U-shaped brackets 70, 80 hold the cushion 36 of the back support 30. In such a case, the width of the base 73, 83 of the U-shaped brackets 70, 80 should be greater than the thickness of the cushion 36 and the plate 35. Because of this, the cushions 40A, 50A can be located in the contour of the cushion 36 of the back support 30.

**[0021]** Between the brackets 41, 51 of the hip supports 40, 50 and the supporting plate 35 there are positioned elongated washers 43, 53, whose cross-section has the shape of the letter U, having a U-shaped cross-section with arms distanced more than the width h1 of the bracket 41, 51, such that the bracket 41, 51 is located between said arms.

#### Claims

1. A back support for a standing frame, the back support (30) comprising:

- a holder (31) for attaching the back support (30) to the standing frame, the holder (31) having a ball stud (32) at its one end;
- a supporting plate (35);
- a carrying plate (34) attached at a first side of the supporting plate (35) and having a socket (33) housing a ball of the ball stud (32); and
- a cushion (36) attached at a second side of the supporting plate (35);

**characterised in that** it further comprises hip supports (40, 50) mounted besides the supporting plate (35), each hip support (40, 50) being mounted on a

bracket (41, 51), each bracket (41, 51) having an elongated arm (41A, 51A) parallel to the supporting plate (35) and rotatable relative to an axis (X1, X2) perpendicular to the supporting plate (35), wherein each hip support (40, 50) has a main plane (40A, 50A) arranged perpendicularly to its elongated arm (41A, 51A). 5

2. The back support according to claim 1, wherein the elongated arm (41A, 51A) of each bracket (41, 51) has an elongated opening (42, 52), and the hip support (40, 50) is attached to the supporting plate (35) by bolts (44, 45, 54, 55) passing through the elongated opening (42, 52) into holes (61, 62, 63, 64) in the supporting plate (35), wherein the holes (62, 64) located further from a side edge (35A, 35B) of the supporting plate (35) have a shape of a sector of a circle. 10 15
3. The back support according to claim 2, wherein the elongated opening (42, 52) has a length greater than a distance between the holes (61, 62 and 63, 64) at a particular side edge (35A, 35B) of the supporting plate (35). 20 25
4. The back support according to any previous claims, wherein each hip support (40, 50) is connected to the elongated arm (41A, 51A) of the bracket (41, 51) by means of a U-shaped bracket (70, 80) having a first arm (71, 81) is connected to the hip support (40, 50) and a second arm (72, 82) forming an extension of the elongated arm (41A, 51A) of the bracket (41, 51). 30
5. The back support according to any previous claims, wherein each hole (62, 64) having the shape of a sector of a circle has a length configured to allow rotary movement of the bracket (41, 51) around the axis of the other hole (61, 63) with a range of up to 30 degrees. 35 40
6. The back support according to any previous claims, further comprising elongated washers (43, 53) between each bracket (41, 51) of the hip support (40, 50) and the supporting plate (35), the elongated washers (43, 53) having a U-shaped cross-section with arms distanced more than the width (h1) of the bracket (41, 51), such that the bracket (41, 51) is located between said arms. 45 50
7. A standing frame comprising the back support (30) according to any of the previous claims. 55

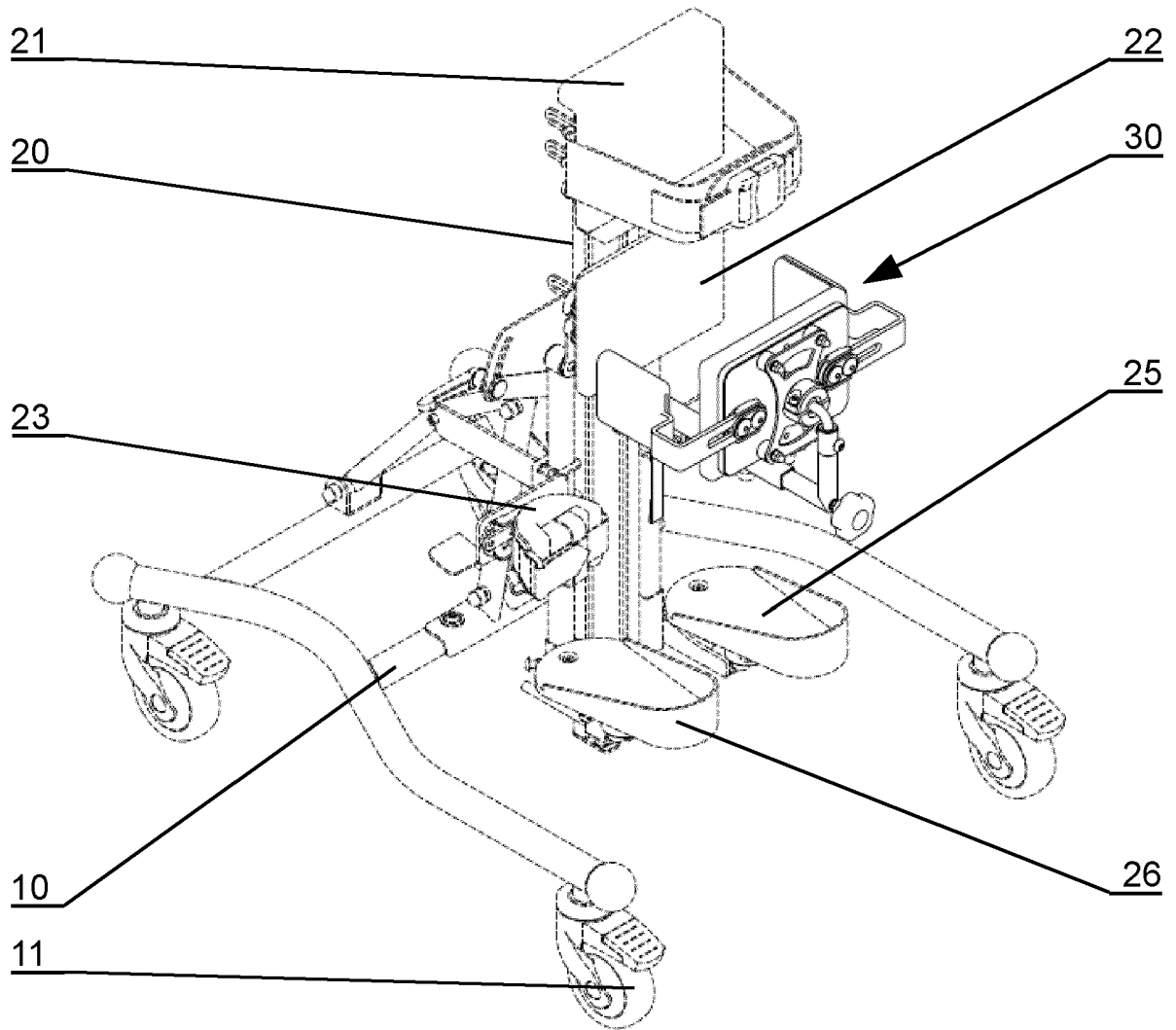


Fig. 1A

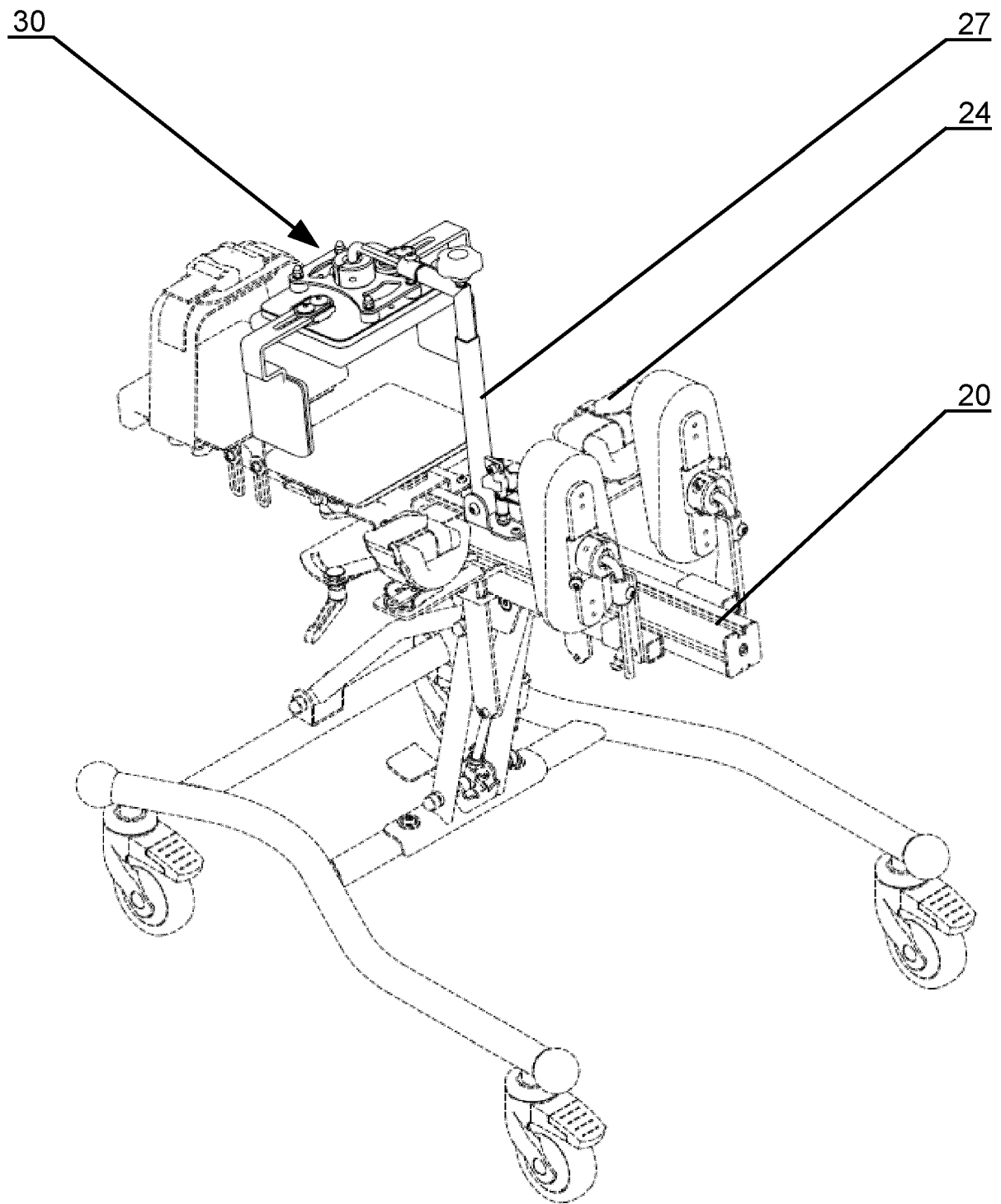


Fig. 1B

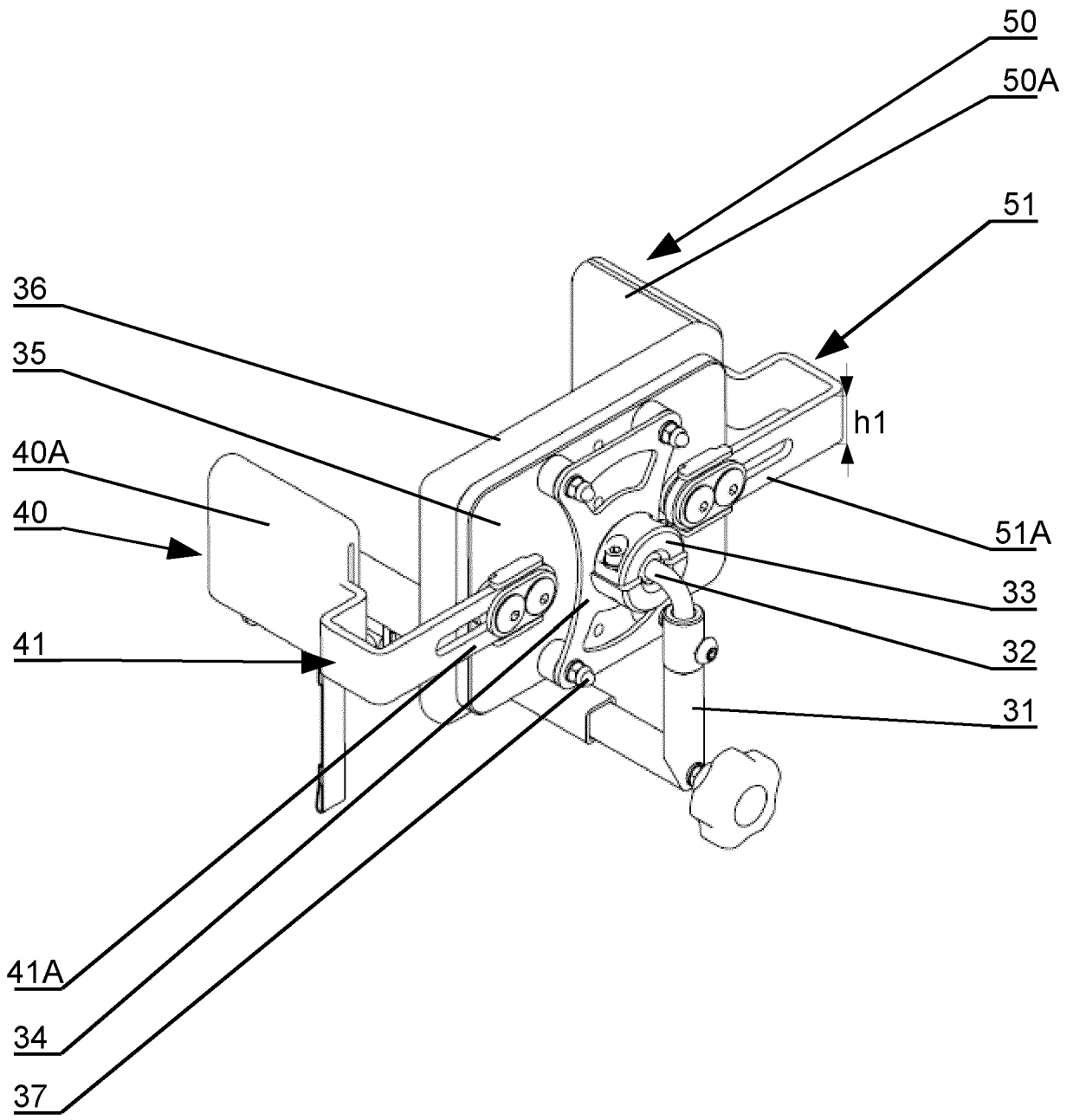


Fig. 2

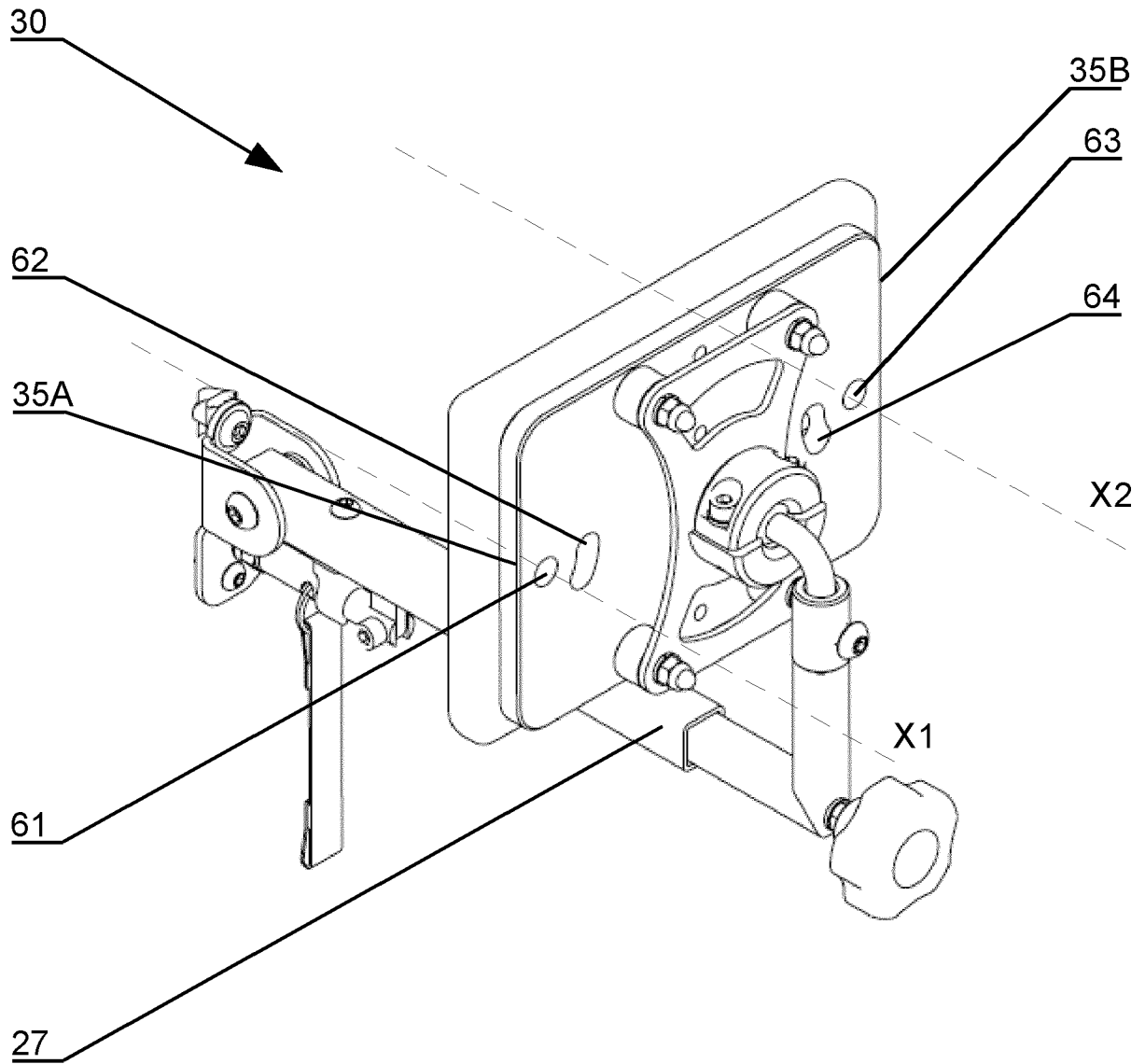


Fig. 3



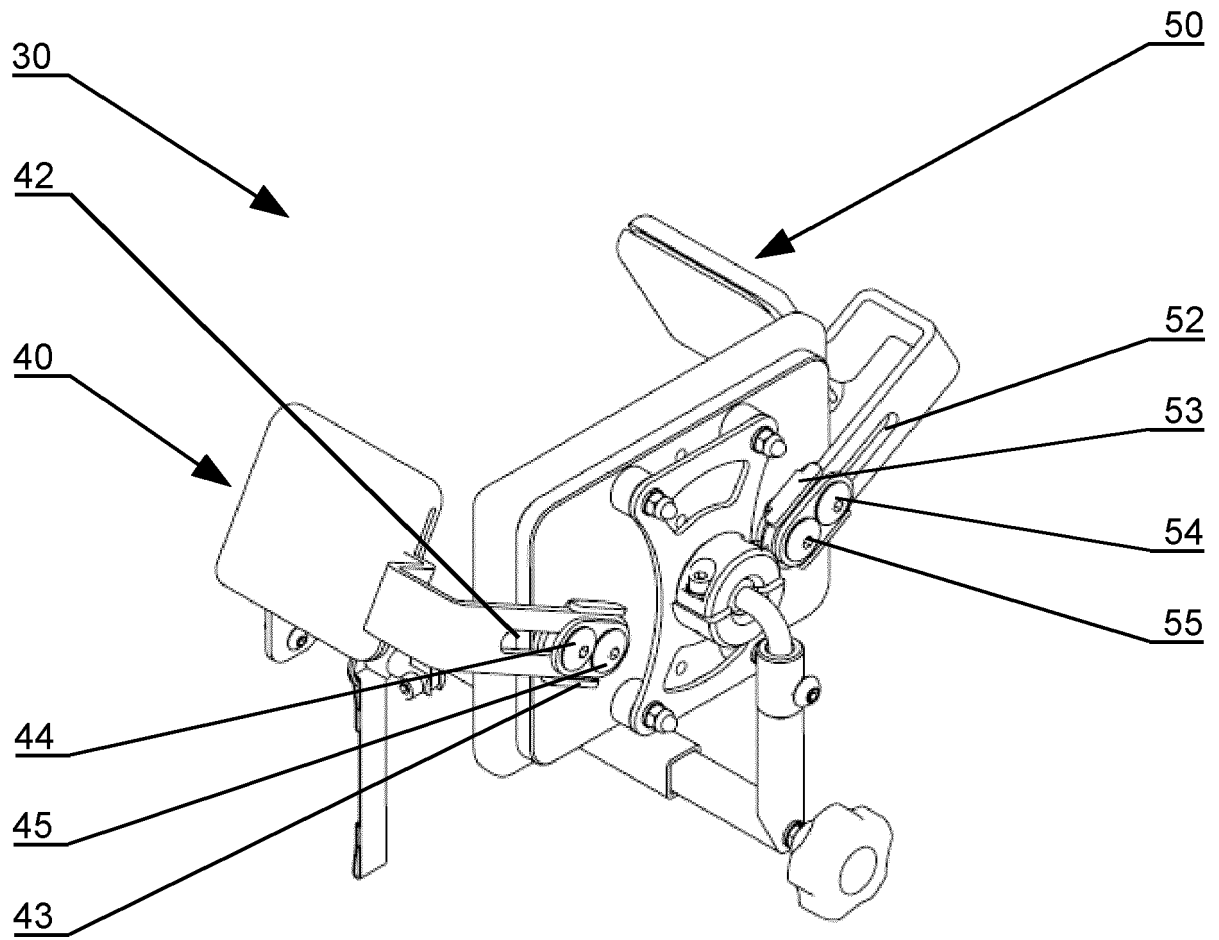


Fig. 4

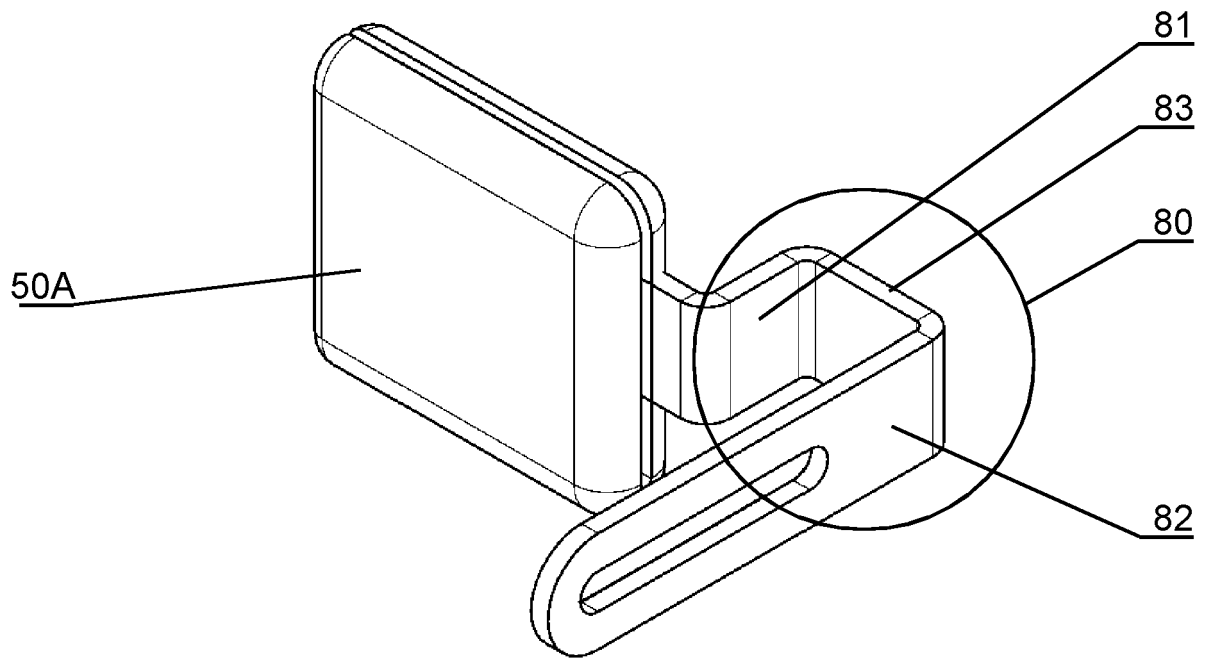


Fig. 5A

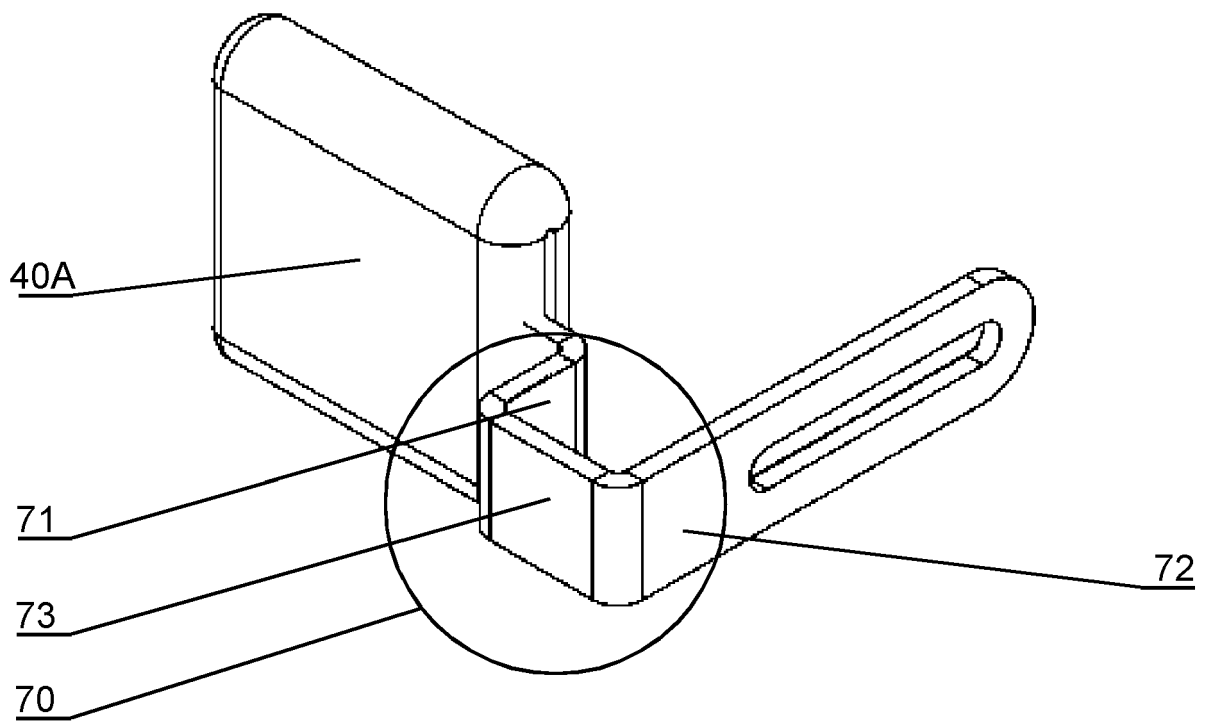


Fig. 5B



EUROPEAN SEARCH REPORT

Application Number  
EP 23 15 3120

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			A61G
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>6 June 2023</b>	Examiner <b>Petzold, Jan</b>
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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06-06-2023

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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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