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(54) Hospital-type bed.

(57) A hospital-type bed to give people nursing care at home comprises a frame (2), a bed section (1) which is made up of segments (1a, 1b) and is fitted so as to be detachable from the frame (2). For moving the bed section (1) in the vertical direction between a low and a high position two lever systems (5-7) are connected to one another by at least one connecting rod (9) and these lever systems (5-7) can be operated by an operating device (15). In order to be able to dismantle the bed in a few minutes into a number of components which can be stacked to give one ore more units which can be manoeuvered easily, each lever system (5-7) forms part of a separate segment (1a, 1b) of the bed section (1) and is detachably connected to the frame (2), the correcting rod (9) between the lever systems (5-7) being detachable.

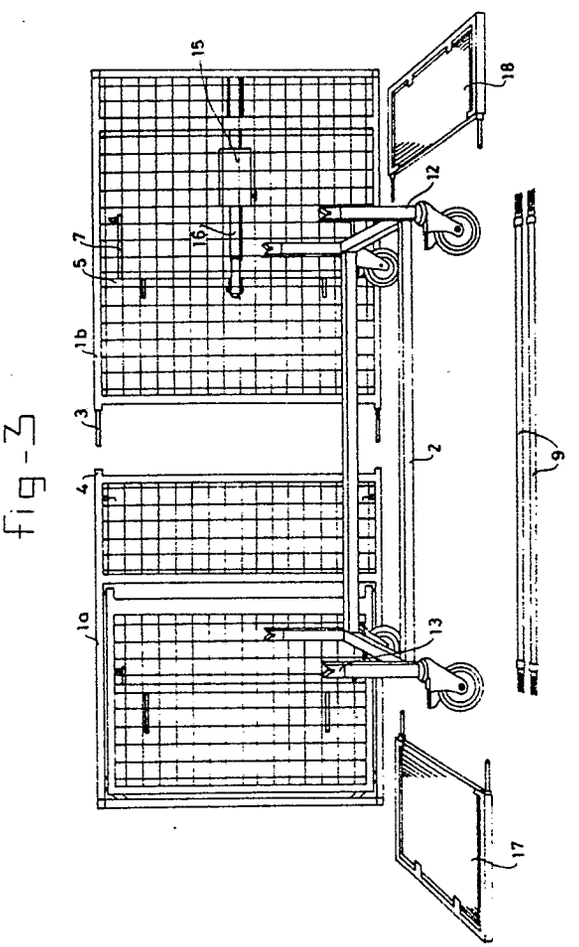

Fig-2

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Hospital-type bed

The invention relates to a hospital-type bed comprising a frame, a bed section which is made up of segments and is fitted so as to be detachable from the frame, and means for moving the bed section in the vertical direction between a low and a high position, which devices comprise two lever systems connected to one another by at least one connecting rod and an operating device for operating said means.

A bed of this type is known from US-A-4, 685, 160.

Low-high beds are generally known and are frequently used in hospitals and nursing homes. The high position is used in order to be able to treat and wash patients easily, while the low position is the normal use position in which the patient can easily get out of his or her bed. There is a tendency to let people who need nursing care stay in a hospital or nursing home for a shorter time and to let them be given some of the nursing care at home. At home there is also a need for a bed which can be brought into a low and a high position. However, existing low-high beds cannot be dismantled or cannot easily be brought into a form in which they can be transported to flats or other dwellings.

In the case of the bed known from the said American patent specification, the lever systems are fitted to the frame. By means of a motor, a gearbox and a lead screw, a tube can be moved backwards and forwards, which operates the lever systems. Moreover, there are separate motors by means of which components of the bed section can be brought into all sorts of positions. The construction is complex, expensive and heavy. The components of the bed cannot be combined into an easily transportable unit.

The objective of the invention is to overcome this drawback and to provide a low-high bed which is robust and serviceable in the use position and can be dismantled in a few minutes into a number of components, which components can be stacked to give one or more units, which can be manoeuvred easily.

According to the invention the hospital-type bed indicated in the introduction is characterized for this purpose in that each lever system forms part of a separate segment of the bed section and is detachably connected to the frame and in that the connecting rod between the lever systems is detachable.

The lever systems can each comprise a transverse rod which is rotatably attached to a segment and which is provided close to both ends with end levers, which have a transverse hinge pin at the end, which pins each engage as clamps in an opening which has been hollowed out in a plastic bearing block.

One of the lever systems can be moved between two end positions, which correspond to the low and the high bed position, by means of a unit to be operated mechanically (manually or motorized), electrically, pneumatically or hydraulically.

The frame can serve as support for the other components in the dismantled state if the length of the frame is considerably shorter than the length of the bed section but somewhat greater than the length of one bed section segment.

Clamping devices, which are detachably clamped around the connecting rod and project, with a hinge pin, through openings in the connecting rod and intermediate levers of the lever systems, can be used to connect the ends of the connecting rod to the lever systems.

The invention will now be illustrated in more detail with the aid of the figures, in which an exemplary embodiment is shown.

Figure 1 shows a perspective view of the high position of the assembled low-high bed.

Figure 2 shows a perspective view of the low position of this bed, one part being perceived as being broken away.

Figure 3 shows a perspective view of the dismantled state of the bed.

Figure 4 shows a perspective view of dismantled components of the bed stacked on top of one another.

Figure 5 shows a detail of the bearing mounting of the bed section on the frame on a larger scale.

Figure 6 shows a detail of an end of a connecting rod on a larger scale.

Figure 7 shows a side view of a telescopically adjustable rod which is used in an alternative embodiment to position the bed with the foot end higher than the head end or vice versa.

Figure 8 is a cross-section along the line VIII-VIII in Figure 7.

The low-high bed shown comprises a bed section 1 and a mobile frame 2. As can be seen in particular in Figure 3, the bed section 1 consists of two segments 1a and 1b which can be coupled to one another in that pins 3 of the segment 1b can be pushed into tubular sections 4 of the segment 1a to provide a fit.

Each segment 1a, 1b has a lever system which consists of a transverse rod 5, two intermediate levers 6 and two end levers 7. The transverse rod

5 of each lever system is rotatably connected at both ends to a rod 8 welded to the particular segment.

In all cases two intermediate levers 6 of two segments 1a, 1b are connected to one another by a connecting rod 9. The connection is detachable, in that a clamping device 10 clamped around the connecting rod is pushed, by means of a hinge pin 11, through openings in a fork-shaped end of the rod 9 and in an end of the intermediate lever 6 positioned in the fork. The clamping devices 10 can easily be loosened.

The frame 2 is provided at each corner with a vertical rod 12, the free end of which has a plastic bearing block 13. This block 13 has a receiving opening 14 which merges into a V-shaped top surface of the block 13. Each end lever 7 has a pin 7a which is clamped detachably and rotatably in the opening 14 of a bearing block 13.

The segment 1b is provided with an operating de-vice 15 in the form of a rod 16, which is operated mech-anically, electrically, pneumatically or hydraulically and is movable and lockable between a pushed-in position, in which the bed section 1 assumes a high position (Figure 1), and a pushed-out position, in which the bed section 1 assumes a low position (Figure 2).

The connecting rods 9 serve to transmit the movement of the lever system of the segment 1b to the lever system of segment 1a.

Each segment 1a, 1b has a detachable end board 17, 18.

It will be clear that the assembled bed can be dismantled within a short time by removing the connecting rods 9, pulling the bed section 1 upwards to release it from the frame 2, sliding the segments 1a, 1b apart and detaching the end boards 17, 18. These components can be combined into a small package (see Figure 4) or packed in boxes which can be carried easily.

At the intended place of use, the components can be joined together in a very short time to give an assembled low-high bed. No tools are needed for dismantling and assembling.

The bed according to the invention is, in particular, very suitable for loan stores and for incidental users with little storage space (home nursing care, sickbay on ships and the like); however, use in old people's homes, nursing homes and hospitals can result in advantages.

The characteristics are completely identical to a normal low-high hospital-type bed, so that all customary nursing actions are possible without subjecting patient and nursing staff to undue strain. The bed can be supplied including a mattress in two boxes weighing about 25 kg per box.

Figure 1 shows that the bed section segment 1a has a so-called back support section 19 which can be locked in various positions. The locking mechanism is designed such that unlocking with the aid of the lever 20 can take place only if the back support section is not under load.

Figures 7 and 8 show a telescopically adjustable rod which, in place of the connecting rods 9 in the embodiment according to Figures 1 to 6 inclusive, connects the lever systems to one another. In the alternative embodiment, each of these lever systems has only one lever 6, the telescopic rod extending between the levers 6. The rod comprises an inner tube 21 and an outer tube 22, each of which is provided with a welded connecting rod 23 and 24 respectively. The inner tube has a number of notches 25 in which a locking boss 26 can engage. This boss is hingeably connected at 27 with two lugs 28, 29, which are welded to the outer tube 22. Between these lugs the outer tube 22 is provided with a slit to permit passage of the boss 27. By means of a spring 30, the boss 27 can be pulled into the locking position, in which the tubes 21 and 22 are locked relative to one another. By manually hinging the boss into the unlocked position, the tubes 21 and 22 can be slid relative to one another. When the boss is released, it will spring into the first notch 25 which passes the slit in the outer tube. By sliding the tubes 21 and 22 into and out of one another, the connection between the two lever systems becomes shorter or longer and the bed assumes an oblique position with the head end higher or lower than the foot end.

Various modifications of the construction described and drawn are possible within the scope of the invention.

Claims

1. Hospital-type bed comprising a frame (2), a bed section (1) which is made up of segments (1a, 1b) and is fitted so as to be detachable from the frame, and means for moving the bed section in the vertical direction between a low and a high position, which devices comprise two lever systems (5-7) connected to one another by at least one connecting rod (9) and an operating device (15) for operating said means, characterized in that each lever system forms part of a separate segment (1a, 1b) of the bed section and is detachably connected to the frame (2) and in that the connecting rod (9) between the lever systems is detachable.

2. Hospital-type bed according to Claim 1, characterized in that each lever system comprises a transverse rod (5) which is rotatably attached to a segment and which is provided close to both ends with end levers (7), which have a transverse hinge

pin (7a) at the end, which pins each engage as clamps in an opening (14) which has been hollowed out in a plastic bearing block (13).

3. Hospital-type bed according to Claim 1 or 2, characterized in that the length of the frame (2) is considerably shorter than the length of the bed section (1) but somewhat greater than the length of one bed section segment (1a, 1b).

4. Hospital-type bed according to one of the preceding claims, characterized in that clamping devices (10), which are detachably clamped around the connecting rod and project, with a hinge pin (11), through openings in the connecting rod (9) and intermediate levers (6), are used to connect the ends of the connecting rod (9) to the lever systems (5, 6, 7).

5. Hospital-type bed according to one of the preceding claims, characterized in that the connecting rod comprises two tubes (21, 22) which can be slid telescopically into one another, and there are locking devices (25 to 30 inclusive) to lock the tubes in various positions relative to one another.

Fig-1

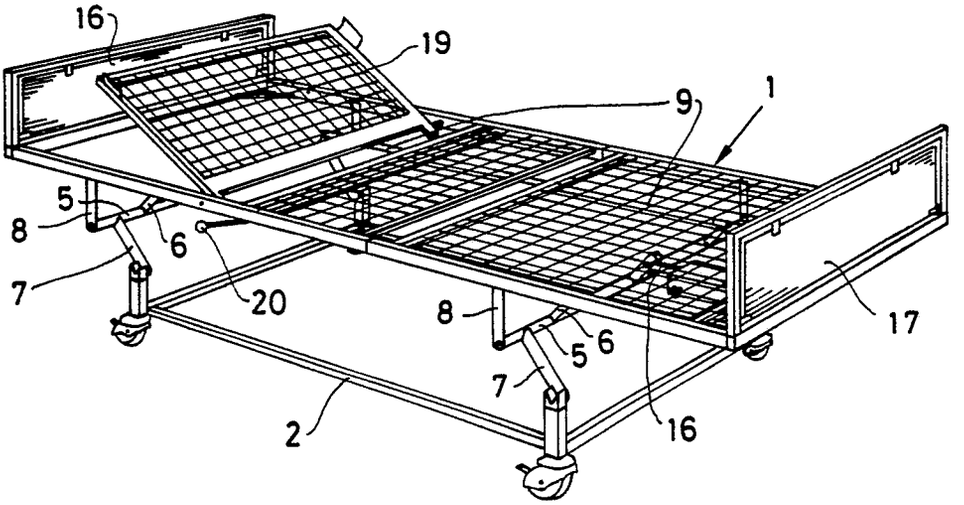
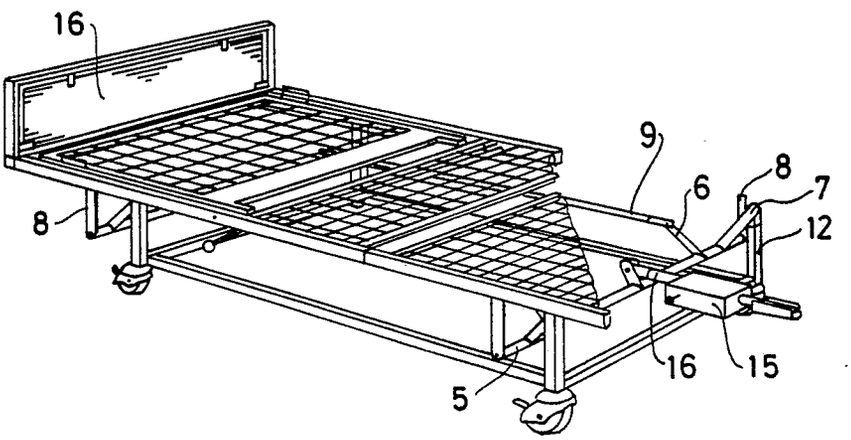


Fig-2



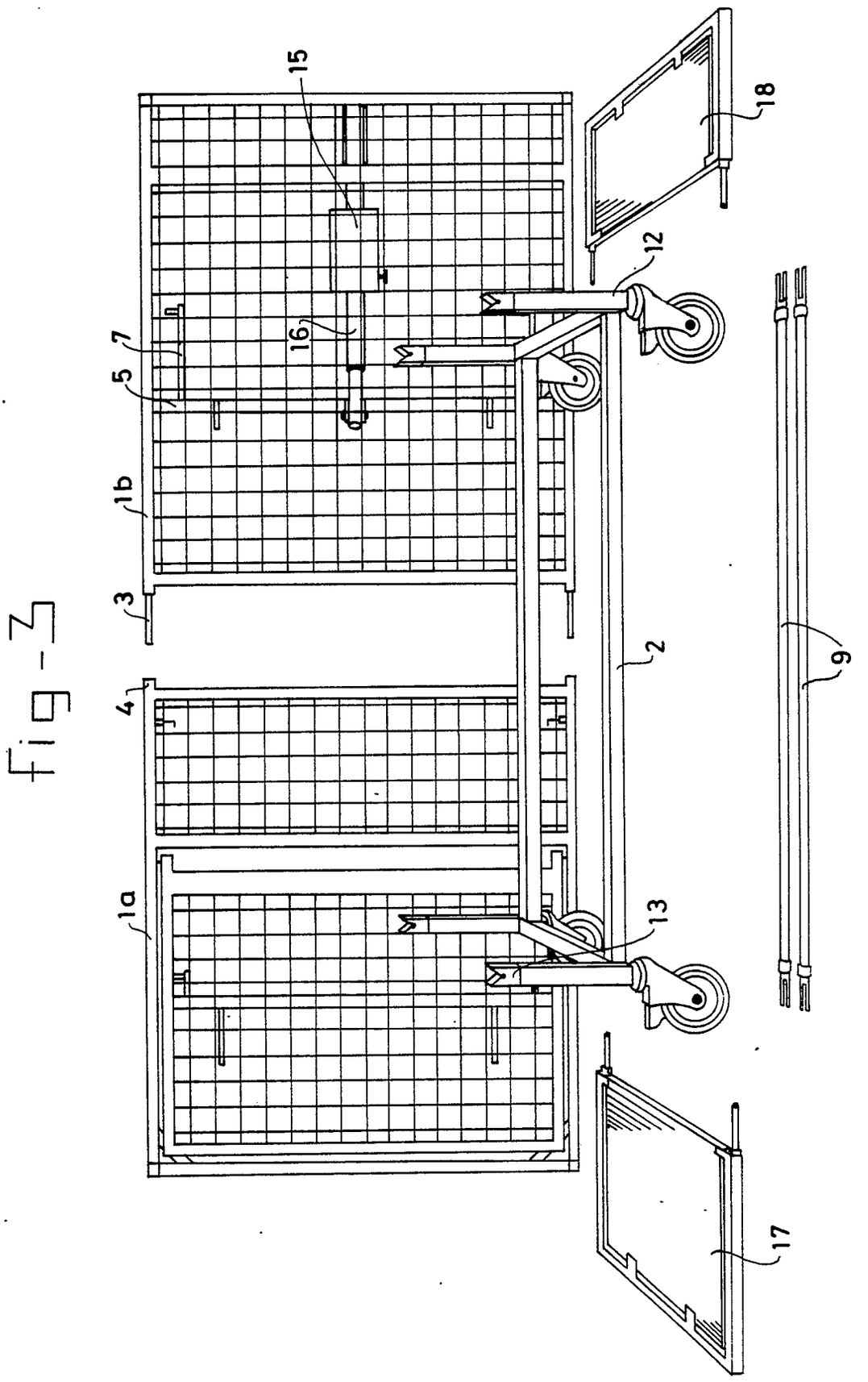


Fig-3

Fig-4

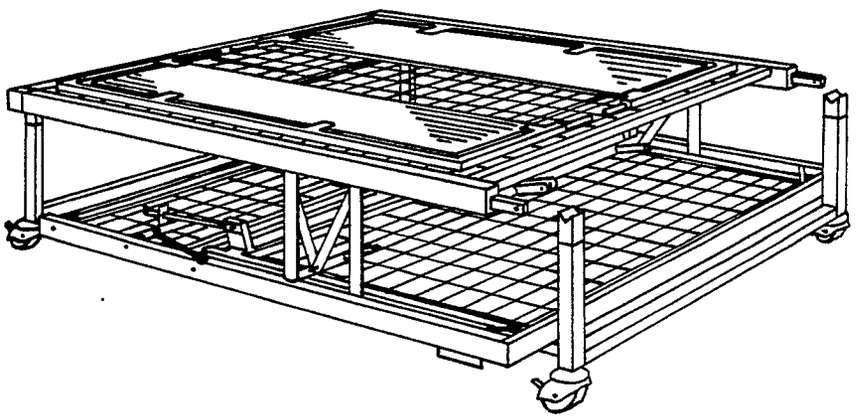
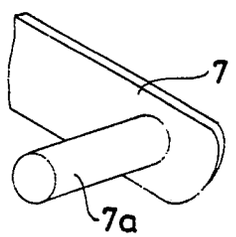


Fig-5



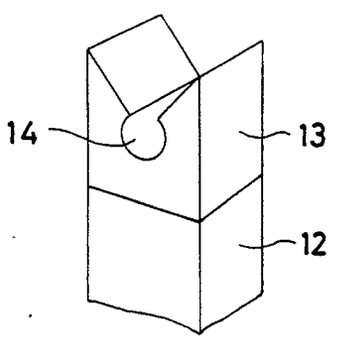
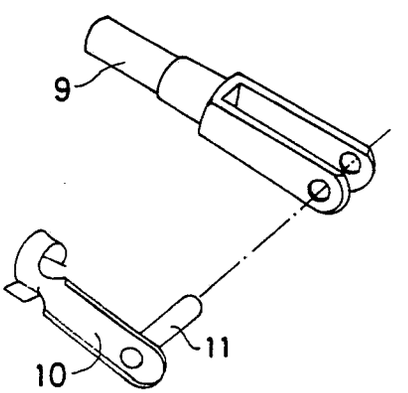


Fig-6



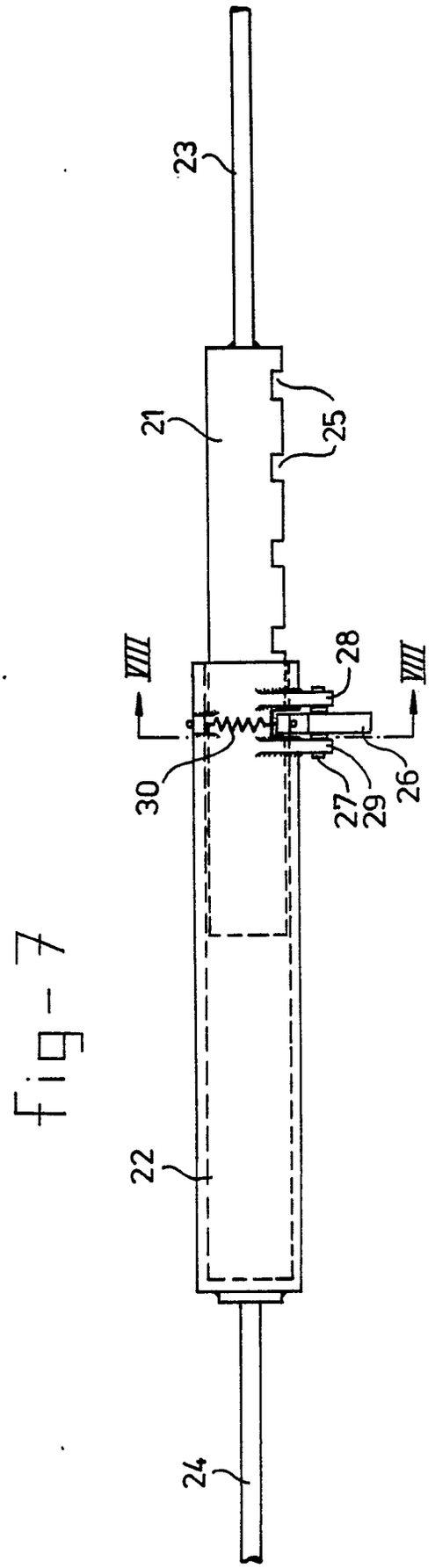


fig - 7

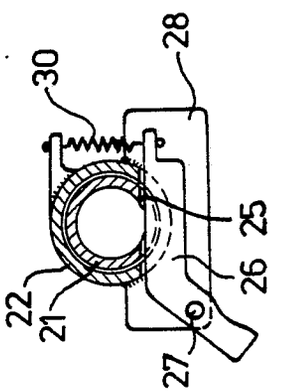


fig - 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 20 2495

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.4)
A,D	US-A-4 685 160 (RIZZARDO) * Whole document *	1,2,4	A 61 G 7/00
A	GB-A-1 431 706 (SIDDALL & HILTON) * Page 1, lines 15-26; figures *	1	
A	NL-C- 92 684 (VILLEDARY) * Claims; figure *	1	
A	DE-A-1 906 332 (BIGLER, SPICHIGER & CIE. AG) * Page 4, lines 1-11; figures 1,2 *	1	
A	CH-A- 373 142 (EMBRU-WERKE) * Page 1, lines 49-60; figure 1 *	1	
A	DE-C- 661 154 (VAN DER VEN) * Page 2, lines 57-66; figure 1 *	1	
A	US-A-3 739 406 (KOETTER) * Column 4, lines 44-68; column 5, lines 1-9; figures 7,8 *	3	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

A 61 G
A 47 C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13-02-1989	BAERT F.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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