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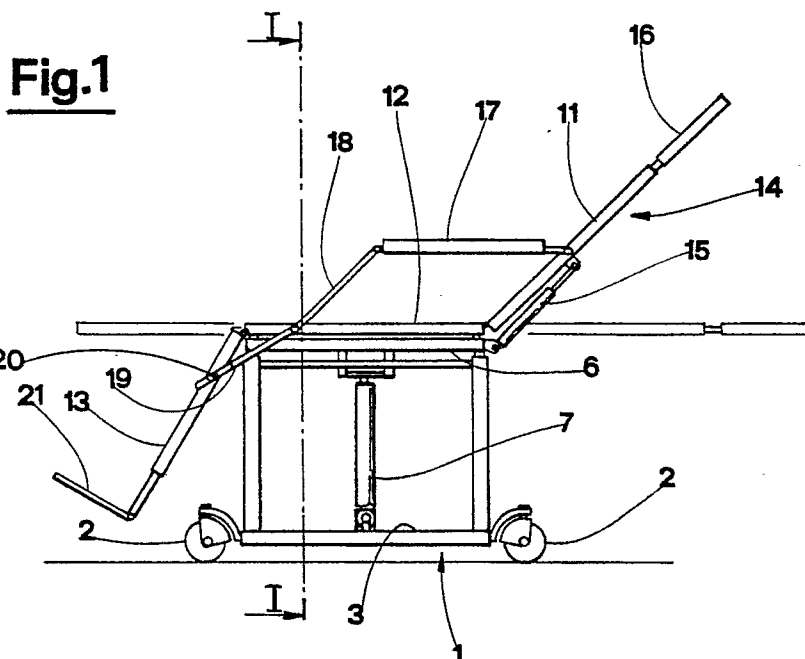
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54 **A wheeled stretcher for the easy transfer of patients from bed to stretcher and vice versa.**

57 The present invention concerns a wheeled stretcher aimed in particular at enabling the easy transference of a patient from bed to stretcher and vice versa.

A height-adjustable upper structure (6) is mounted to a frame (1) equipped with wheels (2). On this structure (6) a variable-configuration element (14) is arranged, formed by at least three principal segments (11), (12) and (13) which are hinged consecu-

tively and are positionable in such a way as to enable the formation of a plurality of wheelchair configurations as well as a flat stretcher configuration. The central element (14) is mounted to the upper structure (6) in such a way as to permit of sideways sliding from a centred position on same structure (6) to an overhanging position, and vice versa.



# A WHEELED STRETCHER FOR THE EASY TRANSFER OF PATIENTS FROM BED TO STRETCHER AND VICE VERSA.

Object of the present invention is a wheeled stretcher with the particular feature of enabling the easy transfer of patients from bed to stretcher and/or vice versa.

Principal object of the invention is to realise a structured means for the transfer of patients who should not be raised from the bed by normal means, to a means of transport and/or vice versa by one operator alone, who is required to perform only simple manoeuvres.

Other aim of the invention is to provide a piece of equipment, said stretcher, which presents characteristics of versatility and multi-usability so that it can be used according to necessity either as a wheeled stretcher or as a wheelchair.

The present invention, as it is described in the claims which follow, reaches the above aims by means of a piece of equipment which is both simple and safe to use.

Further characteristics of the invention will be better described in the detailed description which follows of a preferred but not exclusive embodiment of said invention, here presented in the form of a non-limiting example, with reference to the accompanying illustrations, in which:

- fig. 1 shows a schematic side-view;
- fig. 2 shows a section according to plane I-I of fig 1;
- figs. 3, 4, 5 and 6 show, schematically, some operative phases during use of the invention.

With reference to the illustrations, fig. 1 denotes a frame (1) mounted on wheels (2). The wheels are four in number and are mounted to the rectangular base of the frame (1) by means of supports rotatable around vertical axes which permit said wheels to be oriented in any direction. In particular one of the pairs of wheels (2), arranged on one side of the frame (1), is mounted by means of rotatable supports to a horizontal structural element (3) which is movably fixed to the frame (1) by means of two parallel horizontal arms (4) axially slidably coupled to said base. The axial sliding of the arms (4) with respect to the base and thus the moving of the structural element (3) comprising the wheel pair (2) from position A to position B and vice versa is obtained by action of a master cylinder (5) operating directly between the element (3) and the base of the frame (1). An upper structure (6) is mounted to the frame (1) with the ability to move vertically in both directions, and is operated by action of a vertical-axis hydraulic cylinder (7).

In the form of the invention shown in the illustrations the movements of the upper structure (6) with respect to the underlying frame (1) are

vertically guided by the axially slidable couplings realised between the tubular elements (8), which are fixed to the upper structure, and the hollow posts rising from the base of the frame (1).

On the upper structure (6) straight horizontal guides (10) are arranged parallel to the direction of movement of the horizontal structural element (3), on which the central segment (12) of a variable-configuration element (14) is slidably coupled. Said variable-configuration element (14) comprises, hinged to the opposing ends of its central segment (12), two other segments (11) and (13). Segments (11), (12) and (13) are hinged consecutively one to the other around axes parallel to the sliding direction of segment (12) along the straight guides (10) and are reciprocally articulated in such a way as to be positionable in a plurality of seating-type configurations, in each of which the central segment (12) remains horizontal while segment (11), assuming the function of backrest, and segment (13), assuming the function of legrest, can be variously inclined with respect to the horizontal, as well as in a horizontal configuration in which said segments together become a single horizontal plane and thus constitute a true and proper slim-thickness stretcher. Positioning from the horizontal state to any inclined position and vice versa of the backrest segment (11) is performed hydraulically by means of a master cylinder (15) whose base is fixed to the central segment (12) and whose stem is hinged to the bottom surface of the backrest segment (11). The backrest segment (11) is equipped with an adjustable headrest (16) and is further fixed to the central segment (12) by means of two hinged parallelograms, of which bars (17) and (18) form part. Said parallelograms are arranged in such a way that, in the horizontal configuration, the two bars (17) and (18), having the function of armrests in the wheelchair configuration, flatten horizontally by the side of segments (11) and (12) and do not protrude above the flat stretcher surface formed by them.

In the wheelchair configurations, with segment (11) no longer horizontal, the two bars (17) and (18) become armrests in which bar (17) stays in a horizontal position independently of the inclination of segment (11). The legrest segment (13) can be separated longitudinally into two parts, one for each leg, each part being fixable in the desired position with respect to the central segment (12) by means of a rod (19), hinged to one end of said central segment (12), which can be fixed to one of the two parts of segment (13) by means of a fixing set (20). Each of the two parts of the legrest segment (13) has at its extremity an adjustable footrest (21). All

of the master cylinders (5), (7) and (15) are part of a hydraulic circuit fed by a pump (23) which in the illustrated embodiment is easily activated by hand by the operator in order to perform the necessary manoeuvres. Between the horizontal structural element (3) and the central segment (12) either a mechanical or hydraulic linkage may be mounted (not represented in the illustrations) through which movements out of and into the normal position of said structural element (3) happen in accordance and simultaneously with the sideways sliding of the central segment (12) and thus of the entire element (14) on the straight horizontal guides (10). This can be particularly useful in the case of the configuration illustrated in fig. 4 where element (14), positioned horizontally, is slid into a potentially overbalancing position with regard to the upper structure (6).

The functioning of the invention is well illustrated in figs. 3 to 6 in which some operative phases are represented by means of which a patient can be transferred from his bed (24) to the stretcher. The stretcher, with element (14) in the horizontal configuration, is brought to the side of the bed (24). Then cylinder (7) is activated lifting the entire structure (6) to the level of the bed so that element (14) can be made to slide laterally along the guides (10) and can come to rest at least partially on the bed (24). Simultaneously with the sliding of the element (14), element (3) is drawn out, guaranteeing the stability of the stretcher. In other embodiments the sideways displacement of the wheels might not be deemed necessary. When the position illustrated in fig. 4 is reached, the patient can be transferred on to the element (14), in the stretcher configuration, by gently turning him or her in the direction indicated by the arrow (26). The operation can easily be performed by one operator alone. The element (4) is rather thin so that it will not cause an obstacle during the moving of the patient from the bed on to the stretcher. The stretcher can be kept immobile during the operation by means of the usual braking devices on the rotatably mounted wheels (2).

Once the patient is in position on the stretcher surface constituted by element (14), said element (14) can be slid back into the central position along the guides (10). Also, the element (3) having the wheels mounted to it is brought back into its original position so that the entire structure, in its horizontal configuration, can be used as a wheeled stretcher. By producing the desired inclination of segments (11) and (13), the entire element (14) can be changed into a wheelchair configuration which enables the structure to be used as such.

By following the above-described cycle in reverse, the patient can be transferred from stretcher to bed.

## Claims

1) Mobile stretcher aimed in particular at permitting the transfer of patients from bed to same stretcher and vice versa, comprising:

- a frame (1);

- an upper structure (6) mounted on said frame (1), mobile and vertically positionable with regard to said frame (1);

a variable-configuration element (14) mounted on said upper structure (6) laterally slidable in a horizontal direction on said upper structure (6) from a centrally aligned position to at least an overhanging position and vice versa; said element (14) being formed by at least three principal segments (11), (12) and (13), substantially flat and thin, which are hinged consecutively one to the other around axes parallel to the direction in which element (14) is slidable with respect to said structure (6), comprising at least one central segment (12) functioning also as a seat, to which are hinged at either end at least one segment with chairback function (11) and at least one segment with legrest function (13), it being foreseen that said segments (11), (12) and (13) are reciprocally hinged so as to be positionable in a plurality of wheelchair configurations with respect to which said central segment (12) is maintained in a substantially horizontal position while said backrest segment (11) and said legrest segment (13) are variably inclinable with respect to the horizontal central segment (12) but allowing of at least one horizontal configuration with all segments together providing a slim-thickness stretcher plane.

2) Wheeled stretcher as in claim 1, in which said frame (1) is equipped with wheels (2) of which at least one is arranged at the side of said stretcher and which can be made to extend sideways outwards from the side of said frame (1) from which the variable-configuration element (14) is slidable from its centrally aligned position; said wheel is mounted to a structural element (3) which is mounted to the frame (1) in such a way as to be moveable in a parallel or nearly parallel direction to the sliding of the variable-configuration element (14).

3) Wheeled stretcher as in claim 2, wherein two of said wheels (2) are mounted to said structural element (3); wherein it is foreseen that the outward and return movements of said structural element (3) are simultaneous with the sliding movements of said variable-configuration element (14).

4) Wheeled stretcher as in claim 3 wherein said movements of said structural element (3) to which said wheels (2) are mounted are realised by means of an actuator (5) operating between said frame (1) and said structural element (3).

5) Wheeled stretcher as in claim 1, wherein said

variable-configuration element (14) is fixed to said upper structure (6) by means of straight horizontal guides (10) onto which the central segment (12) is axially slidably hinged; said upper structure (6), on which are mounted said horizontal guides (10) shall be made to move in a vertical direction with respect to said frame (1) along vertical guides by action of at least one vertical-axis master cylinder (7) operating between said frame (1) and said structure (6).

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6) Wheeled stretcher as in claim 5, wherein said central segment (12) has mounted to it the base of a master cylinder (15), whose stem is hinged to the bottom surface of said backrest segment (11)

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7) Wheeled stretcher as in claim 1, comprising a pair of constant horizontal-axis armrests (12) one on either side of said wheeled stretcher in wheelchair configuration; said armrests (17) being shaped into the rods which form part of two hinged parallelograms, of which two members are solid to said central segment (12) and to said backrest segment (11) in such a way that in the horizontal configuration said armrests (17) flatten horizontally by the side of said central segment (12) of said stretcher and so do not protrude above it.

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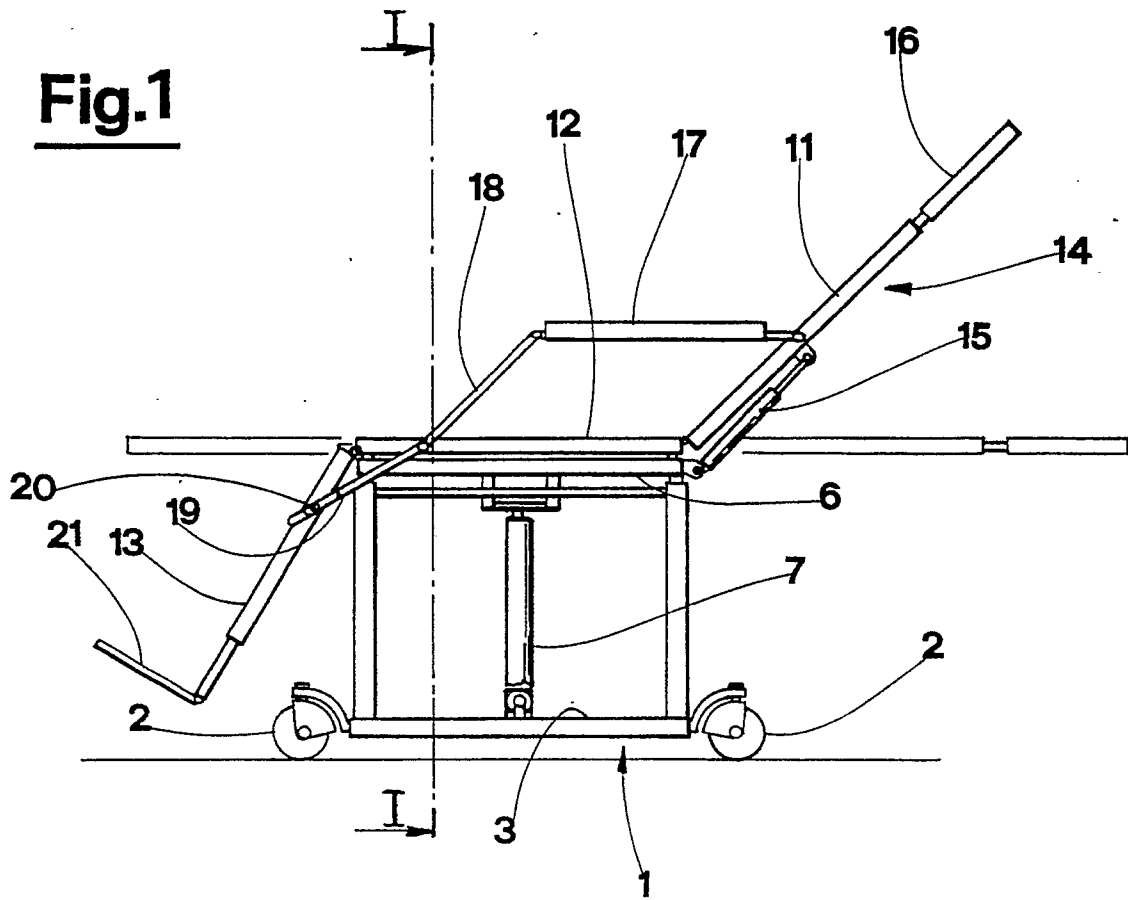
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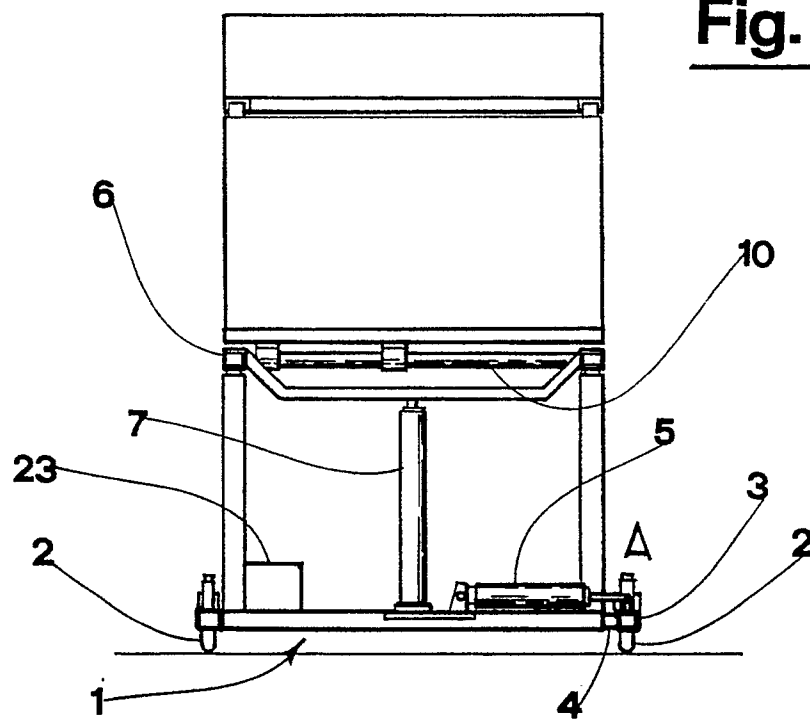
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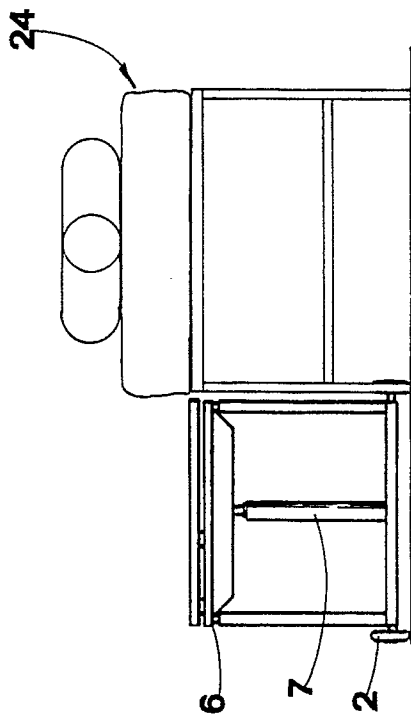
**Fig.1**



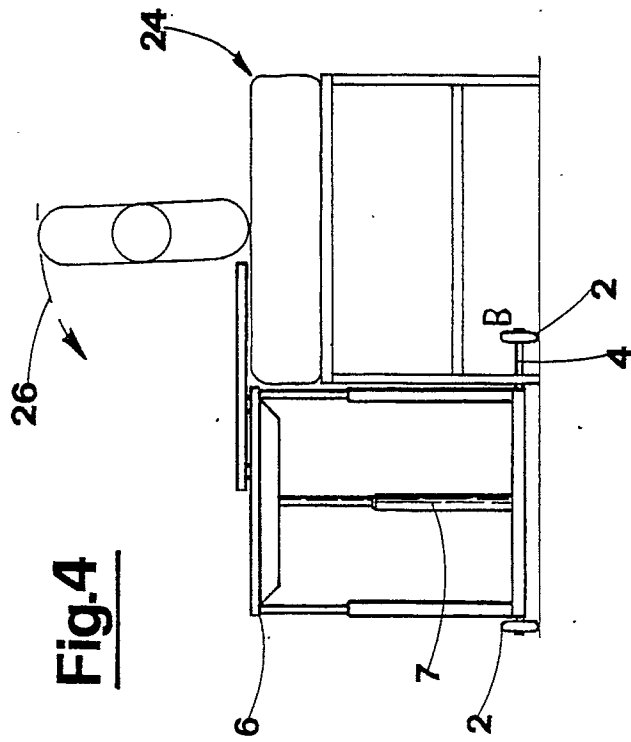
**Fig.2**



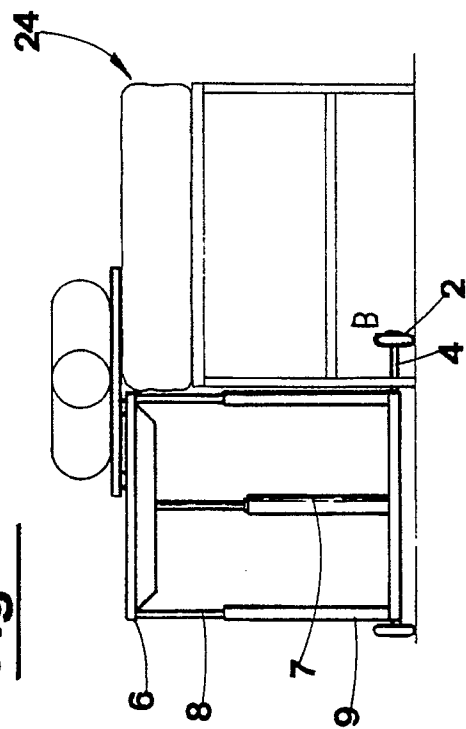
**Fig.3**



**Fig.4**



**Fig.5**



**Fig.6**

