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(54) Patient transfer device, convertible into a chair

(57) Articulated stretcher which can be transformed into a chair, adaptable to beds, comprising a general frame with support overhang arms, being fitted with three bodies making up the back, seat and headrest and with a footrest step all of them articulated one to the other in order to selectively position each function.

Each element and arrangement of the different functions of the stretcher, counts on driving and holding elements at the same time which transmit power and movement to the back, armrest, footrest and seat.

The whole set is installed by means of a pair of stays fixed onto a rolling sliding base being fitted with a piston which in combination with the stays moves the stretcher in the rising and lowering sense.

Preferred figure, number 5th.

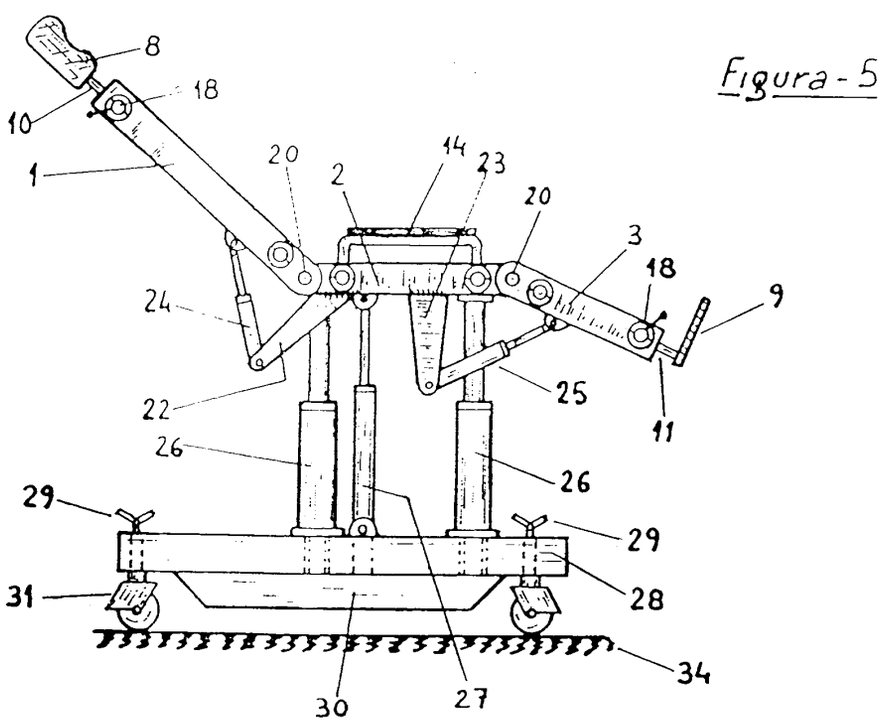

Figura - 5

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Description

SUBJECT MATTER OF THE INVENTION

[0001] The invention has as its subject matter, according to the heading, a new stretcher fitted with devices duly joined amongst themselves mechanically, by means of which, the stretcher can be transformed into a chair and can also be adapted on a horizontal surface couch, for example a bed.

[0002] This type of stretchers is adequate to be used in hospitals, homes for the elderly or even at private domiciles or in any other places where it is necessary to move a disabled person.

STATE OF THE ART

[0003] Several types of stretchers are already known for the movement of disabled persons, which are fitted with mobile areas which allow to rise and/or lower the patient, whose devices may be controlled by any adequate means, whether it is manual and/or motorised, and in some cases they are fitted with small dimensioned lifting devices.

[0004] The stretcher posed by the invention, has been perfected in its design, organisation and assembling characteristics, thanks to which marked advantages and broad possibilities are obtained for the ends to which they are intended.

[0005] A more complete idea of the invention, is provided in the following description, being considered, together with the drawings attached, in which in a quite schematic manner, the sets and details preferred for the idea of the invention are represented.

[0006] In the drawings:

[0007] **Figure 1st.-** View of the set of the stretcher with all its elements, holding a person -32-, in a horizontal resting position and parallel to the horizontal plane of the couch -33- for resting.

[0008] **Figure 2nd.-** View of the parts of the resting bearing and support elements for all the parts of the body of the disabled person -32-. These elements will be installed onto a special support frame, where all the corresponding comfort elements -8-, -5-, -6-, -1- and -9-, will be easily assembled by inserting them and fixing them onto the bars -4-.

[0009] **Figure 3rd.-** Plan view of the three main resting elements indicated with the movement (A) for their insertion into the bars -4- of the support frame. It can be seen that the seat has the arm rest -15- attached. The possibility of placing on this seating element -6- a urinal -35- is also indicated. We may see the location of the locking elements -13- and the pass through holes -21- for the spikes -10- and -11- corresponding to the headrest -8- and the footrest -9-.

[0010] **Figure 4th.-** Plan view of the main support frame with its mobile parts of the back -1- and legs -3- articulated at the ends of the central sector -2- onto which the seat is organised, which can be fitted on both sides with two armrests -14- and -15-. The movements of the parts of the frame, take place thanks to the turning points -20-. It can be seen how the support bars -4- are set projecting out of the frame and the future assembling of the back -5-, seat -6- and leg-rest is represented.

[0011] **Figure 5th.-** Side elevation view of the stretcher, being it possible to appreciate the location of the piston -24- which operates the back and of the piston - 25- which operates the leg rest -3-. Being it possible to elevate the complete stretcher thanks to the main piston -27- in combination with the holding supports-26-.

[0012] **Figure 6th.-** View of the set, in the chair or seating position, with a person -32- upright. It represents the back -5- in the highest setting. The pistons -24- and -25- are respectively at their maximum and minimum positions.

[0013] **Figure 7th.-** It corresponds to a detail of the setting, in projection, of the bars -4- on the frame-1-, -2-, and -3-. Said bars are made of two tubular elements -4-, advantageously cylindrical, with a closed and rounded end in order to facilitate the assembling of the bodies -5-., -6-, and -7-; the end opposite to these bars is joined with a nucleus or washer through which it is fixed by means of bolts to the frame, being fixed, and projecting out in overhang. Inside the bars or arms -4- there are two resistant shafts -36-inserted which are susceptible of being axially displaced with alternative straight movements, which increase the good mechanical resistance of the arms -4-. These shafts are driven from the frame, by means of a lever -18-. In this figure it can be seen that the shafts -36- have a lug -38- adapted which moves with movements limited in respect to the corresponding tube -4- which surrounds the shaft -36-, in such a way that when sliding toward one side or the other, said shaft will hold the spikes -10- and/or -11- whether it is in the case of the headrest -8- or footrest -9-.

[0014] **Figure 8th.-** Side view of the set of the stretcher, being it possible to see that the support arms -4- project in overhand and the stretcher can be moved in sense (B) in order to place the couch over, for instance, a bed -33-, a bathtub -43-, being placed in the setting represented in **figure 9,** which represents the stretcher placed on the couch of the bed -33-, making possible the handling of the patient -32- in a simple manner.

[0015] **Figure 10th.-** This figure has been represented as an example , showing one of the application possibilities of the stretcher for the hygiene of the disabled person -32-, allowing us a simple and safe handling over the bathtub -43- on which the formation of a lower free space -44- has been foreseen in order to receive the sliding base -28- of the stretcher.

DESCRIPTION OF THE DIFFERENT ELEMENTS THAT TOGETHER MAKE UP THE PERFECTED

STRETCHER SUBJECT MATTER OF THE INVENTION.

[0016]

1.- Part of the main frame that will hold the backing elements -5- once they are introduced into the corresponding bars -4-.
2.- Central part of the main frame that will hold the seat elements -6- once they are introduced into the corresponding bars -4-. An armrest -14- is assembled onto it.
3.- Part of the main frame that will hold the leg rest elements -7- once they are introduced into the corresponding bars -4-.
4.- Holding bars where the person -32- to be moved will be located, these bars will have the most adequate shape, so that the same may be introduced under the person -32- in the least violent manner, and at the same time, are able to hold the necessary weight. Depending on the circumstances, their number may be increased.
5.- Body of the back which will be inserted onto the support bars -4- of sector -1- of the frame, in order for which inside of it there is a pair of tubular elements -17- housed in a parallel arrangement, which adapt telescopically onto the corresponding support arms -4-, fixed on sector -1- of the frame. These tubes -17- are fixed onto a base plate -16- being the set covered by an elastic mulching mass, the body -5- of the back is held on the support bars -4-, by means of a strategically placed stud-bolt -13-. It also comprises a locking device -13- to fix the back to the bars -4- and stabilise it.
6.- Body that makes up the seat which includes, as does the back -5-, a pair of tubes -17- arranged in parallel, fixed on to a base plate -16- on which set there is the corresponding elastic mass installed making the seat. This body is inserted into the support bars -4- held at the central sector of the frame, on which they are retained by means of the corresponding stud-bolt -13-. There is an armrest adapted on the seat -15- which will be joined to the tubes -17- and which will be coupled to the armrest -14- of the frame -2-. Adequately, it will be possible to incorporate a recipient -35- to this seat, functioning as a urinal or equivalent.
7.- Leg rest element with the same organisation as the back -5-.
8.- Headrest element fitted with two projections reciprocally parallel, in the shape of spikes -10- which are introduced into the transversal holes -21- punctured on the upper edge of the back, being locked by the fastening bars -36- by means of the regulation and fastening organ -18-, a close up of which can be seen in figure 7th, in which it is reproduced at a larger scale.
9.- Step footrest element from which two spikes are projected orthogonally parallel to one another -11- being installed on the body -7- in an arrangement similar to the one foreseen for the headrest -8-.
10.- Fastening spikes of the headrest -8-.
11.- Assembling spikes of the footrest -9-.
12.- Fastening hole located at the bars -4-, where the locking system will operate the back -13-, seat and leg-rest -5-, -6- and -7-.
13.- Locking stud-bolt system, which will stabilise the elements -5-, -6- and -7- once they are assembled onto the corresponding support bars -4-, according to (A).
14.- Armrest, which is permanently installed onto the frame -2-, which will be coupled to the armrest-15- which is installed on the end side of the seat -6-.
15.- Armrest located on the seat -6-.
16.- Base plate which acts as the frame for each of the elements: back -5-, seat -6- and leg-rest -7-. This plate -16- stabilises and holds for each element-5-. -6- and -7- the tubes that act as their guides -17- which are telescopically adapted to the support bars-4-.
17.- Fastening tubes for the elements -5-, -6- and -7- which are joined to each element by means of the base plates -16-.
18.- Driving lever for the fastening device for the spikes -10- and -11- of the back and footrest.
19.- Holes in the support bars -4- wherein the spikes -10- and -11- corresponding to the headrest -8- and footrest -9- are inserted.
20.- Joint points for the main frame of the parts -1-, -2- and -3-, allowing their rising or lowering, being transformed into a chair or a stretcher.
21.- Holes in the elements -5- and -7- which go through the tubes -17- into which the corresponding spikes -10- and -11- are inserted.
22.- Rigid arm which holds the piston -24- that will act on the frame -1- of the back -5- in order to rise it or lower it. This flap is held to the central sector -2- of the frame.
23.- Arm fixed to the central sector -2- of the frame, onto whose arm articulates the piston -25- which controls the movements and positioning of sector -3- of the frame onto which the footrest is organised.
24.- Piston acting on part -1- of the frame corresponding to the back.
25.- Articulated piston at the arm -23- which drives the leg-rest -7-.
26.- Guiding stays which act as pillars which hold the articulated frame and the different elements which have been added to it. These guides are consistent and act in combination with the main piston -27- which acts as main elevator, which will elevate or nor, the set of the stretcher for all the necessary manoeuvres.
27.- Main piston, which is the one that acts on the set of the stretcher, allowing the necessary movements thanks to the guides -26- which stabilise the

set.

28.- Support base of the set of the elements which shall be mentioned. The necessary devices are installed onto it, as are the rolling sliding devices for the movement of the stretcher, in this case by means of wheels -31-.

29.- Brake pedal which will act on the wheels -31-, but the wheels will always brake in pairs, since they are joined by the bar -40- which makes the break pedal activate the two wheels.

30.- Housing which holds several mechanisms such as batteries, etc.

31.- Turning wheels which will allow the free movement of the set of the stretcher, on which the pedal -29- will operate the wheels always in pairs.

32.- Body of the person which is to be moved.

33.- Mattress of a bed on which the person -32- is resting.

34.- Steady ground on which the bed, the bathtub, the stretcher with its wheels -31- are located.

35.- Possible accessory with urinal included, which will be incorporated to the seat -6-.

36.- Fastening bar, which moves thanks to the turning of the lever -18- in order to stabilise the corresponding spikes -10- or -11-.

37.- Threaded screw belonging to the lever -18- which inserts into the bar -36- to transmit a frontal movement, and lock the spikes which support the headrest -8- or the footrest -9-.

38.- Stud-bolt for positioning and guiding the bar -36-.

39.- Frame fastening screw -1-, -2- or -3- for the corresponding bars -4-.

40.- Connection bar between the two braking pedals -29- that act on the wheels -31-.

41.- Housing to hide the side mechanisms.

42.- Wall on which the bathtub -43- mentioned as an example leans.

43.- Bathtub with uncovered base for the introduction of the base of the stretcher -28-, being it possible to use the stretcher for the toilet of the person -32- with the minimum disturbances.

44.- Housing underneath the bathtub -43- for the base of the stretcher -28-.

A.- Movement that needs be done in order to place the back -5-, seat -6- and leg-rest -7- elements in order to be set and fastened onto the support arms -4-.

B.- Movement of the set represented in figure 8 - to be afterwards arranged in the manner seen in figure 9 - being the person -32- on the bed, supported by the bars -4- and afterwards be able to remove them, in the opposite sense.

EXPLANATION OF THE INVENTION

[0017] The invention is intended to provide a new stretcher with mechanical devices which allow to transform it, according to will and to the needs, into a chair. This stretcher, may be easily adapted to all kinds of beds, bathtubs and couches.

[0018] In order to facilitate the understanding of the stretcher proposed, figures 1st, 5th and 6th of the drawings attached show the main three positions into which it can be arranged. Figures 8th and 9th show the easiness with which the stretcher can be adapted to a bed and figure 10th shows the possibility of being assembled onto a bathtub underneath of which there exists enough room for the base of the stretcher to be introduced, which operation is done easily, since the base -28- of the stretcher has adequate means for rolling sliding -31- on which two braking and locking devices -29- may operate. The whole stretcher is organised on a general frame comprising three robust arms -1-, -2- and -3- successively articulated one to the others by means of the articulation points -20-, from each of which the arms -4- are orthogonally projected in overhang which are reciprocally parallel, constituting the means on which are installed the bodies corresponding to the back -5-, to the central part making up the seat -6- and the end part -7- against which the legs of the person who is transported lean.

[0019] These arms -4- receive in a sliding fashion the bodies of the back -5-, seat -6- and leg-rest -7-, in such a way that when the three sectors of the frame -1-, -2- and -3- are set horizontally in line, they make a continuous horizontal couch and the disabled person -32- who rests on it, may be easily transported to a couch or bed -33-.

[0020] As has been indicated, the general frame is made up of three robust sectors -1-, -2- and -3- of the adequate cross-section, for instance, of robust plates, from which the arms -4- project orthogonally in overhang, onto which the bodies -5, -6- and -7- which make up respectively the back, seat and leg-rest are inserted , each of which, to this effect, is transversally fitted with the tubular conducts -17- into which the respective support arms -4- are inserted, being retained on the support arms -4- by means of stud-bolts -13-. Said tubular elements -17- are arranged in pairs inside the bodies -5-, -6- and-7- which make up the back, seat and leg-rest, onto which they are fixed on two resistant plates -16- and once introduced into the support arms -4- they are firmly held by means of the stud-bolts -13- which are introduced into the coincident lay in -12- done to the support arms -4-.

[0021] As can be seen in figure 7th, the fixed arms -4- are advantageously constituted by a cylindrical nucleus or shaft -36- which at one of its ends has a threaded hole into which a regulating screw -37- is inserted whose driving head, located on the outside of the frame, may be driven directly or else by means of the lever -18-.

[0022] It is understood that when the screw is operated -37-, the shaft -36- will move axially and thus it will lock or hold the extraction of the spikes -10- which

project from the headrest -8- which will thus be held in place over the top edge of the back -5-.

[0023] It can be seen in figure 7th that the tube encasing the support arms -4-, has a torn or opening into which the head of a stop -38-, which appears fixed inside the nucleus or shaft -36- is housed. Thus, this nucleus has the possibility of being axially moved in the necessary proportion to press sideways on the spikes -10- of the headrest -8- which is thus held in place over the back -5-, similar arrangement is foreseen for a footrest in the body -7-.

[0024] It is understood that the bodies making up the seat -6-, the back -5- and the leg-rest -7-, are protected by elastic masses which provide these parts with the necessary elasticity for the comfort of the person resting on them, as can be seen in the breakdown shown in figure 2nd.

[0025] The bodies of the stretcher -5-, -6- and -7-, will be adequately conditioned in order to be able to place them between the body of the patient and the mattress of the bed -33-, allowing the movement of the patient with the least disturbances.

[0026] The no. of support bars -4- receiving the bodies -5-, -6- and -7-, may be variable, although in the represented embodiment, there are two bars -4- arranged for each body -5-, -6- and -7-.

[0027] In the stretcher-chair posed by the invention, it has been foreseen that it will be possible to adapt on the top edge of the back -5- and on the lower edge of the body -7-, respectively a headrest -8- and a step to rest the feet -9-, for whose assembling both the headrest -8- and the step -9-, are fitted with two homologous spikes -10- and -11- respectively which are introduced in the case in the headrest -8- into the holes -19- and -21- punctured in the support arm -4- and in the body -5- and into the transversal holes -21- done to the lower edge of the body of the leg-rest -1- and on the corresponding support arm.

[0028] The three parts comprising the frame -1-, -2- and -3- have autonomous independent movements, which allows to position each of them in the arrangement chosen for each case, as is commented below:

a).- Movement of sector -1- of the frame corresponding to the back: Said sector -1- articulates on its lower end on the central body -2- from which a fixed arm is projected -22-, onto which a piston is articulated -24- which, when being operated determines the rising or lowering of the back of the stretcher-chair, positioning it adequately between the horizontal and the perpendicular setting.

b) .- Movement of the central sector -2- of the frame: the central area -2- of the frame really makes the seat of the stretcher which allows to transform it into a chair; on the sides of this chair there are two armrests assembled -14- -15-, the first one fastened onto section -2- of the frame and on the opposite side of the seat the second armrest -15- is assembled. The central sector -2- of the frame receives in an articulated fashion at the edges corresponding to the sections that make up the back -1- and the leg-rest -Sand is fitted jointly, projecting in the descending direction with a pair of arms -22- & -23- on the free ends thereof there are pistons -24- and -25- articulated , by means of which movement is transmitted to the back -5- and to the leg-rest -7-. The central sector -2- of the frame making up the seat receives in an articulated fashion, on its bottom part, a piston-27- which determines the movements in the rising and / or lowering sense of the seat and by means of its run jointly drags the back -5-, seat -6- and leg-rest -7-, positioning the stretcher-chair at the desired height whose movements are supported by two vertical rests-26- which emerge perpendicularly from the base -28- which holds the whole stretcher.

c).- Movement of the part of the frame -3- which supports the body of the leg-rest -7-: The body -7- is installed on this part -3- of the frame onto which the legs of the patient will rest. A piston -25- articulates at the end of the arm -23- which is projected in the descending sense from the central sector -2- of the frame, whose piston operates on the leg-rest -7- in order to position it adequately between a descending perpendicular plane and a horizontal plane.

[0029] As can be seen in the drawings and the preceding explanation, the base of the whole device is made of a platform -28-, inside of which, optionally, the desired devices and mechanisms are housed in order to transmit movement to the different parts of the stretcher. Said base -28- counts on rolling sliding movement means -31- which can be locked by means of the connecting bars -40- by acting on the brake pedal -29-.

[0030] In the precedent description, reference has been made to the fact that the control in order to position the different parts and the set of the stretcher are done by means of the pistons -24-, -25- and -27- and the wheels -31-, however, these devices are nor exclusive, since these movements may be obtained by hydraulic, pneumatic, electrical, mechanical means or else by means of the multiple combinations that can be obtained with them.

[0031] Once the nature of the invention has been conveniently described, as well as the embodiment, in order to transform it into a positive reality, it is stated to the opportune effects, that the invention is not rigorously limited to the details explained in the preceding description, nor to the representative drawings, so that when making the stretcher, it is possible that modifications are introduced into the invention which practise and the circumstances may advise, as long as the former does not change, alter or modify the essentiality of the stretcher that has been described.

Claims

1. Articulated stretcher which can be transformed into a chair, adaptable to beds, of the kind used for moving disabled persons, which stretcher is characterised in that it comprises, in combination and mechanically joined one to the other, the following devices: a general frame from which support arms are projected in overhang (4) on which the couch of the stretcher is formed; three bodies with mulching which are installed on said arms making the back (5), seat (6) and leg-rest (7); a headrest (8) which is installed on the top edge of the back (5); a footrest step (9) which is adapted at the lower end of the leg-rest (7); a sliding base (28) on which the whole set is installed onto which bases are installed the means which provide force and movement to the three bodies that make up the stretcher.

2. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claim 1st, characterised in that it is arranged on a general frame, comprising three robust sectors, advantageously plates (1, 2, 3), articulated amongst themselves successively, which may be independently driven by means of power and movement generating means, in order to selectively position each part of the frame, for each case.

3. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claims 1st and 2nd, characterised in that from each sector (1, 2, 3) making up the frame there are two pairs of arms (4) orthogonally projected, reciprocally parallel, projected in overhang which are joined at one of its ends to the respective plate (1, 2, 3) constituting supports onto which the respective bodies of the stretcher insert making up the couch of the back (5), the seat (6) and the leg-rest (7).

4. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claims 1st and 3rd, characterised in that the arms (4) which project from each sector of the frame (1, 2, 3) are advantageously made up of cylindrical tubular elements which have an end fixed to the frame and the opposite end free, it is closed and rounded in order to be able to receive the respective bodies of the back (5), seat (6) and leg-rest (7) in a sliding manner, being held in place on those support arms, by means of stud-bolts (13), strategically distributed.

5. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claims 1st, 3rd and 4th, characterised in that the bodies making up the back (5), seat (6) and leg-rest (7) have housed on their inside in a transversal position, two pairs of homologous tubular elements (17), with open ends, so that the overhang support arms (4) which project from the frame are inserted and introduced in a sliding manner.

6. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claims 1st and 5th, characterised in that each pair of tubular elements (17) which make up the transversal steps in the back (5), seat (6) and leg-rest (7), are joined by two base plates (16) whose ends are slightly bent in the lifting sense, surrounding said tubular elements (17).

7. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claims 1st and 5th, characterised in that at the upper edge of the back (5) and at the lower end of the leg-rest (7) there are two pairs of holes or housings (21) foreseen, intended to receive and hold respectively, a headrest body (8) and a rest step for the feet (9), being fitted by means to hold said headrest (8) and footrest (9) whose means comprise two bars (36) assembled in a sliding fashion on the inside of the tubular support arms (4), being furthermore fitted with means to alternatively move said bars in the axial direction in order to press and fasten the coupling spikes (10, 11) which project from the edges of the headrest (8) and footrest (9), whose driving means (18) are located on the outside and comprise handles or levers for hand operation.

8. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to claims 1st and following, characterised in that at the lower edge of the central sector (2) of the frame, corresponding to the seat (6) there are two arms (22-23) joined on whose ends two pistons (24, 25) are articulated which transmit power and movement to the back (5) and leg-rest (7), in order to position them from a perpendicular plane to a horizontal plane, in alignment with the seat forming one general couch.

9. Articulated stretcher which can be transformed into a chair, adaptable to beds, according to the preceding claims, characterised in that the whole set making up the stretcher is installed by means of a pair of stays (26) fixed perpendicularly onto a rolling sliding base (28) from which a piston (27) is vertically projected which, in combination with the stays (26) moves and positions the frame which makes up the stretcher, in the rising or descending sense, being the movements of said piston (27) combined with that of the corresponding stays (26).

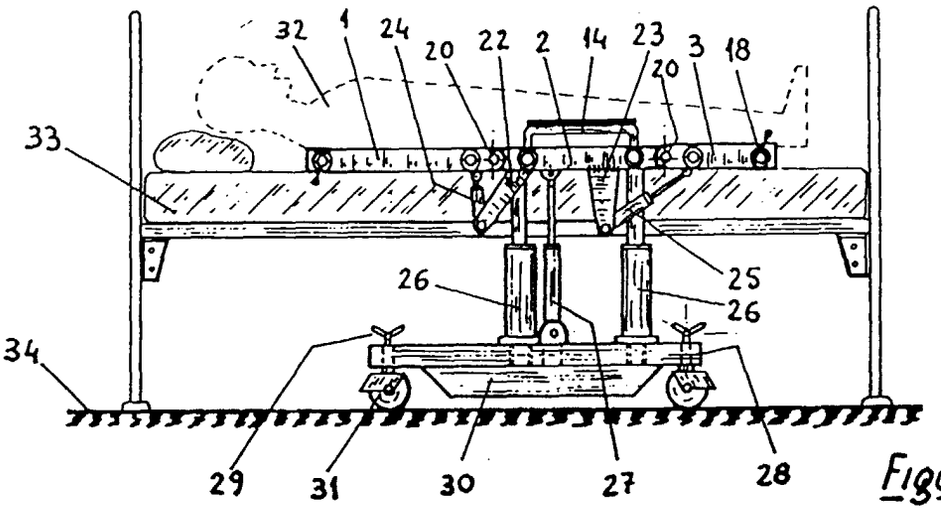

Figura-1

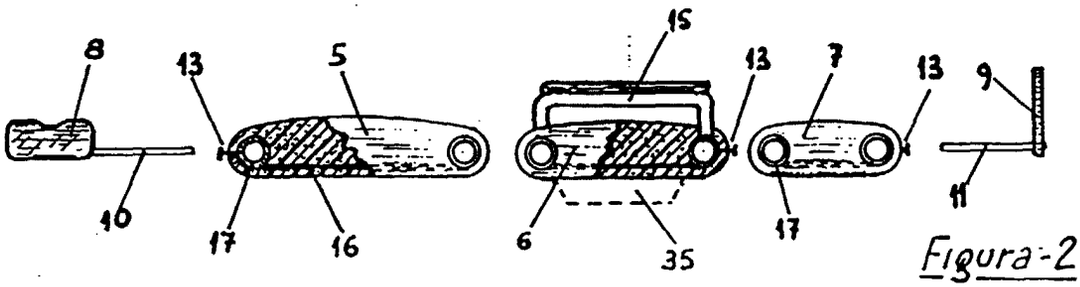

Figura-2

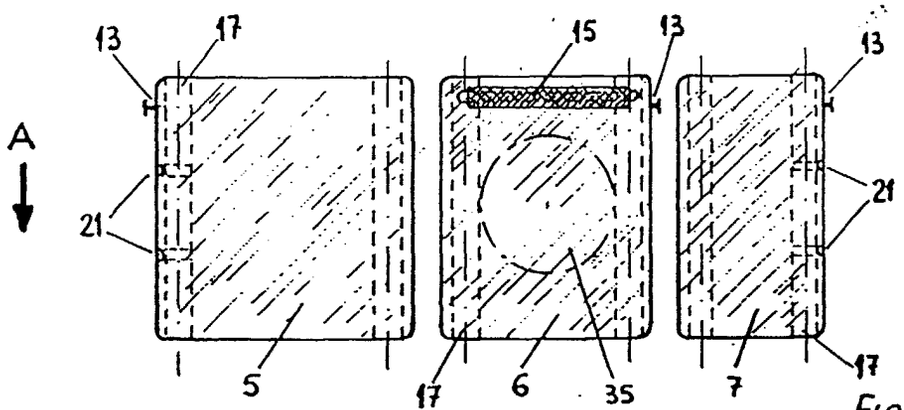

Figura-3

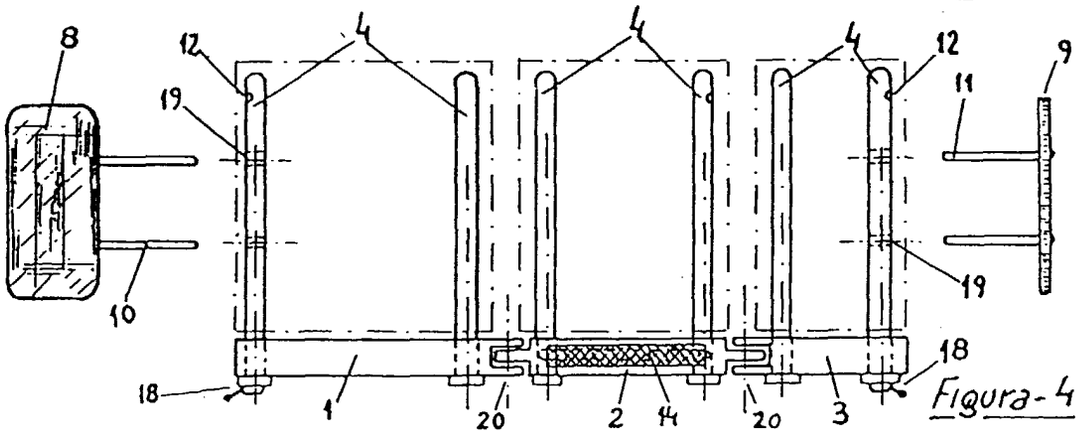

Figura-4

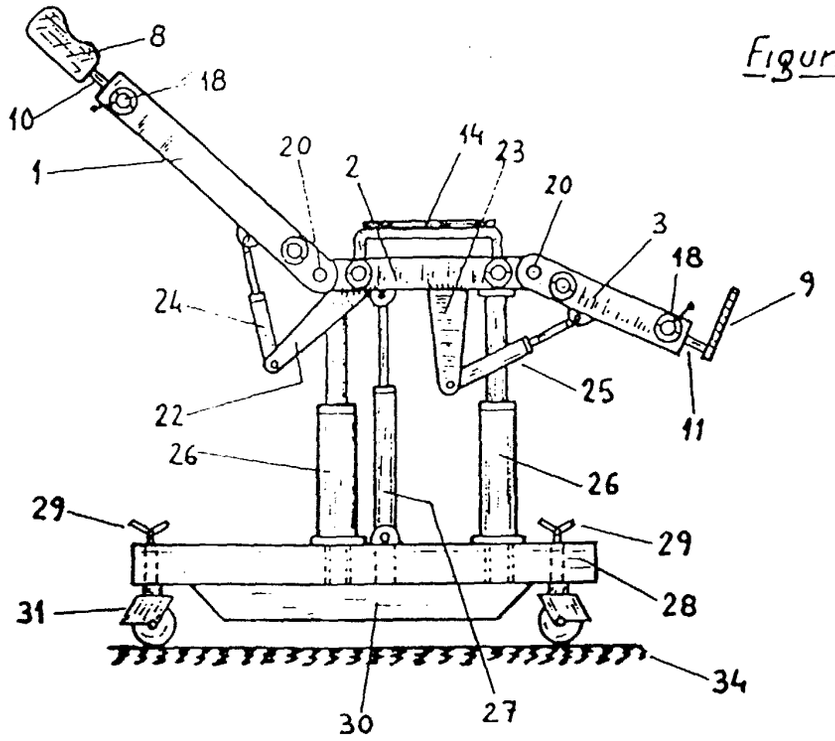

Figura - 5

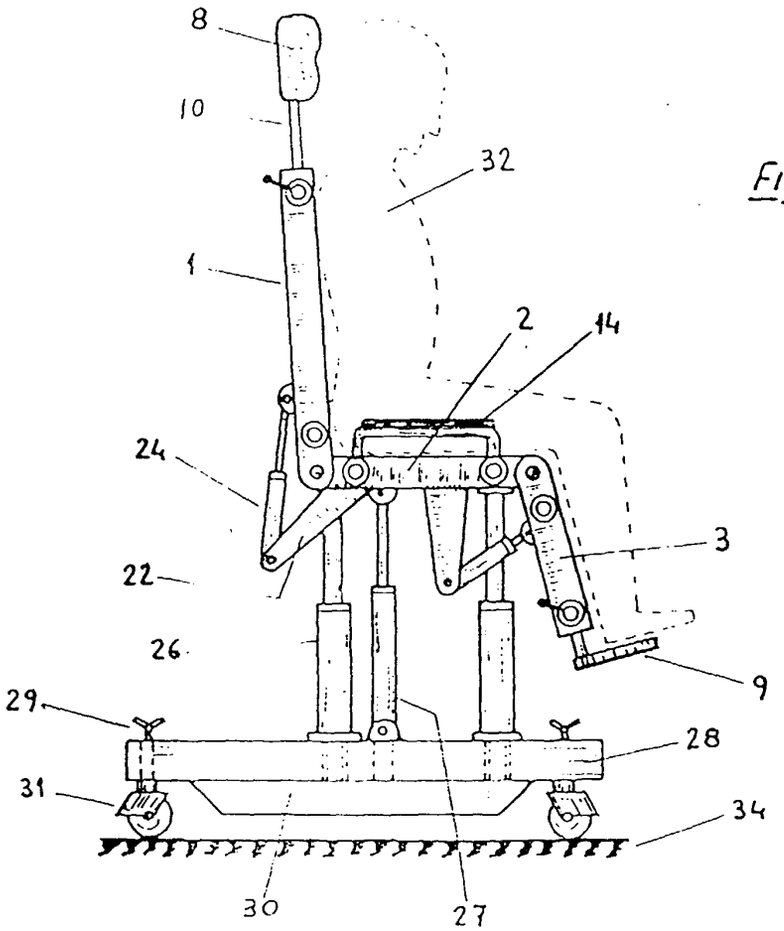

Figura - 6

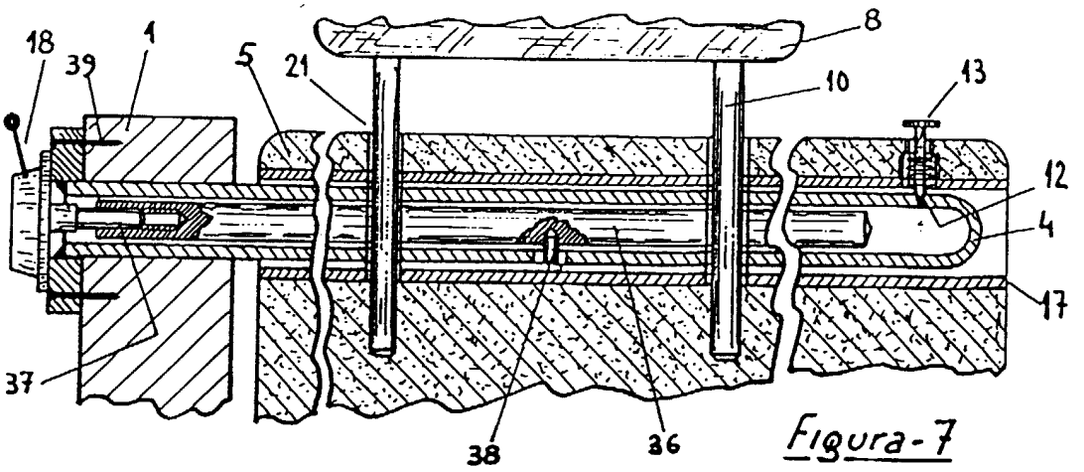

Figura-7

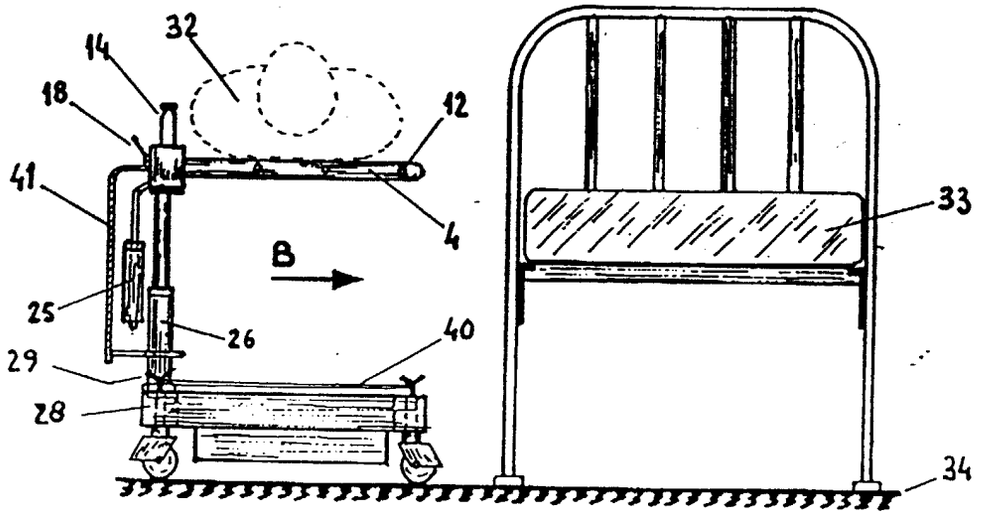

Figura-8

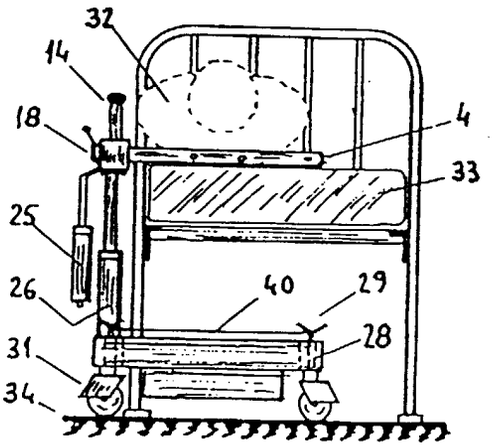

Figura-9

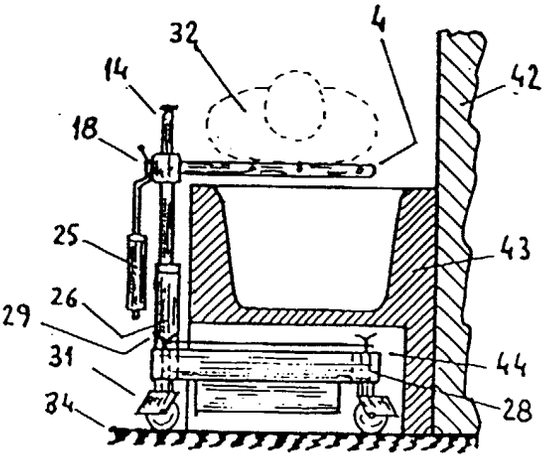

Figura-10