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THERAPEUTIC TREATMENT BED

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FIG. 1.

FIG. 2.

FIG. 3.

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ABSTRACT OF THE DISCLOSURE

The invention comprises a therapeutic treatment bed having an upper and lower frame, a bed mounted on the upper frame, said lower frame having four sleeves with horizontal bars connecting certain of said sleeves together in fixed relation, said sleeves forming corner posts for said frame, said upper frame having four corner posts with horizontal bars connecting said posts together in fixed relation, said corner posts being adapted to telescope into said sleeves, a chain drive extending to opposite ends of said lower frame, a pair of shafts mounted to opposite ends of said lower frame with gears mounted to the opposite ends of said lower frame, a motor mounted to said lower frame and adapted to drive said chain drive with said chain drive driving said gears, said upper frame having rack portions to engage said gears whereby the activation of the motor will drive the chains in either direction and thereby drive the gears in either direction to raise and lower the upper frame and bed relative to the lower frame, an adjustable tension bar extending between said shafts centrally along the lower frame to keep said shafts in axial alignment, L-shaped shielding plates mounted to said sleeves and said posts in telescoping relation to shield the corners of said upper and lower frame.

This invention relates to hospital beds or more particularly the invention relates to therapeutic beds.

It is an object of this invention to provide a novel therapeutic bed which is powered by a motor to be raised and lowered.

It is a further object of this invention to provide a novel simplified therapeutic bed or plinth which can be automatically raised and lowered under power.

It is another object of the invention to provide a novel therapeutic bed which can be raised and lowered by a motor and which has shielding structure to shield the raising and lowering structure from the patient upon the bed.

Further objects and advantages of the invention will become apparent as the description proceeds and when taken in conjunction with the accompanying drawings.

FIGURE 1 is a perspective view of the therapeutic bed invention.
FIGURE 2 is a fragmentary top plan view of the therapeutic bed.
FIGURE 3 is a side elevational view of the therapeutic bed.
FIGURE 4 is a cross-sectional view taken along line 4-4 of FIGURE 3.
FIGURE 5 is a perspective view of the driving structure for raising and lowering the therapeutic bed.
FIGURE 6 is a fragmentary end view of the therapeutic bed.
FIGURE 7 is a schematic circuit diagram of the electric system for raising and lowering the therapeutic bed.

Briefly stated, the invention comprises a therapeutic bed having a bed and rectangular frame with four legs projecting vertically, a second rectangular frame beneath said first frame with four sleeves adapted to slidably receive the legs of said first frame, six pairs of toothed gears mounted to said second frame and adapted to engage rack portions along said frame, a chain drive disposed centrally along said second frame, and driving said gear adjacent said leg, shielding plates draped about the corners of said first and second frame with the shielding plates of the first frame adapted to slide over the shielding plates of the second frame, and a motor for powering the chain drive to raise and lower the bed and first rectangular frame relative to the second frame.

Referring more particularly to the drawings, in FIGURE 1, the therapeutic bed or plinth invention is illustrated having a bed 21 with a rectangular frame 22 having four legs 23, 24, 25 and 26 fixed to the corners and depending vertically therewith, each leg 23-26 has a rack portion 27 along their inner faces. Beneath the frame 22 is a second rectangular frame 28 having four vertical sleeves 29, 30, 31 and 32 to receive the legs 23-26 in telescoping relation. A chain drive 33 is mounted centrally along the second frame. The chain drive 33 has two endless link chains 34 and 35 are driven by a pair of toothed gears 36 and 37 mounted coaxially on the output shaft 38 of a conventional gear reduction mechanism 39 in a conventional manner and the gear reduction mechanism in turn drives the gears 36 and 37.

At the outer ends 36' and 37' of the chains 36 and 37 are toothed gears 40 and 41 which are fixed coaxially onto shafts 42 and 43 respectively.

At the outer ends of shaft 42 are a pair of toothed gears 44 and 45 which mesh with the rack portions 27 of the legs 23 and 24. At the outer ends of shaft 43 are a pair of gears 46 and 47 which mesh with the rack portions 27 of the legs 25 and 26.

Four rectangular housing members 48 are fixed to the sleeves 29, 30, 31 and 32, respectively of the second frame. The housing members 48 have open ends 49 along the side that faces the rack portion 27 of the legs 23-26. The gears 44, 45, 46 and 47 have their shafts 42 and 43 rotatably mounted in the housing members 48.

Mounted along the outside of the second frame 28 are a pair of shielding plates 49 and 50 which surround the ends 28' and 28" of the second frame 28. A pair of shielding plates 51 and 52 are fixed to the first rectangular frame 22 and telescope outside the shielding plates 49 and 50. The shielding plates 51 and 52 have diagonal corners 53, so that as the second frame is lowered, the corners of the plates 51 and 52 will not accidentally cut into the shoes on the feet of a person standing nearby. The first rectangular frame will lower down until the lower edges 51' and 52' of the shielding plates 51 and 52 are even with the lower edges 49' and 50' of the shielding plates 49 and 50, so that there will be space between the shielding plates 51 and 52, and 49 and 50 for a person's foot to pass underneath when the first frame is lowered, as soon as the lower edges 51' and 52' of the shielding plates 51 and 52 become even with the lower edge 49' and 50', frame 21 will engage a limit switch 65 which stops and reverses the motor 67 causing the second frame to be driven upward again.

An elongated tension bar 55 extends longitudinally along the length of the second frame 28. The tension bar 55 has a short rod 56 slidably mounted in a bore 60 at one end of the tension bar 55. The short rod 56 has a bearing block 57 fixed to one end of the rod. The block 57 has sleeve portion with a bore 58 therethrough. The shaft 42 is rotatably mounted in the bore 58 of the block 57 and the other end of the rod 56 is slidably mounted in a bore 60 of tension bar 55. The short rod 56 is threaded along its other end 56' and a nut 61 is threaded onto that end and abuts the end 55' of the tension bar. At the other end of the tension bar 55 is another bearing block 62
which has sleeve portion with a bore 62 therethrough and the shaft 43 is rotatably mounted in the block 62. The tension bar acts to keep the shafts 42 and 43 spaced apart as the weight of the chains and the action of the chain drive have a tendency to draw the shafts toward one another, and it is the function of the tension bar 55 to keep the shafts 42 and 43 spaced apart and in alignment.

The bearing blocks 57 and 62 may be adjusted away from one another by threading the nut 61 along the threaded end 56 so as to force the end 55 of the tension bar away from the short rod 56, thus spacing the bearing blocks 57 and 62 further apart, conversely, the blocks may be adjusted toward one another by threading the nut 61 in the opposite direction.

OPERATION

The therapeutic bed invention 20 is operated as follows:

The manually operated switches 73, 73' and 73" are connected together mechanically so that they move in unison either upward or downward when viewed from FIGURE 7. Limit switches 65 and 66 are normally closed, which stop the motor when the upper bed frame 22 has telescoped upward fully telescoping the legs 23, 24, 25 and 26 upward in the sleeves 29, 30, 31 and 32 of the lower frame or has retracted fully.

The motor 64 of a conventional type which can be reversed by reversing the leads 74 and 74' by switching switches 73, 73' and 73" either upward or downward.

When the master switch 75 is closed the motor 64 will be activated which drives the gear reduction mechanism 39 which has an output shaft 38 which drives the gears 36 and 37 fixed to the output shaft 38. The gears 36 and 37 drive the chains 34 and 35 respectively and the chain 34 and 35 drives 40 and 41 respectively, thereby driving shafts 42 and 43 in the same direction causing gears 44, 45, 46 and 47 to engage the rack portions 27 of the legs 23-26 and drive the legs 23-26 upward in the sleeves until the limit switch 66 is engaged which turns off the motor.

The operator will then reverse switches 73, 73' and 73" which reactivates the motor in the opposite direction, retracting the legs 23-26 downward into the sleeves 29-32 until the limit switch 65 is engaged, which again turns off the motor 64 until the switches 73, 73' and 73" are again reversed.

The operator may turn off the motor 64 at any time by opening the master switch 75.

The shielding plates 51 and 52 which cover the backs and side corners of the telescoping bed invention to prevent a patient lying on the bed 21 of the bed invention from accidentally getting his hands into the rack portions.

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