POWER OPERATED PARALLEL BAR DEVICE

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

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FIG. 6.

FIG. 7.

FIG. 8.
The invention relates to hospital treatment equipment, more particularly, the invention relates to parallel bar apparatus for hospital therapeutic treatment.

It is an object of this invention to provide a novel motorized parallel bar apparatus for therapeutic treatment of hospital patients.

It is a further object of the invention to provide a novel parallel bar apparatus for therapeutic treatment of hospital patients which has parallel bars which can be powered vertically and horizontally to different adjusted positions.

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

FIG. 1 is a perspective view of the motorized parallel bar invention.
FIG. 2 is an enlarged fragmentary top plan view of one of the parallel bars of the bar invention.
FIG. 3 is an enlarged fragmentary side elevational view of the motorized parallel bar invention with portions broken away to reveal the invention thereof.
FIG. 4 is a fragmentary further enlarged view of one of the horizontal sleeves of the parallel bar invention.
FIG. 5 is a cross-sectional view taken along line 5-5 of FIG. 4.
FIG. 6 is a top plan view of the motorized parallel bar invention.
FIG. 7 is a fragmentary front elevational view of the motorized parallel bar invention.
FIG. 8 is a schematic diagram of the electrical circuitry system for the parallel bar device.

Briefly stated, the invention comprises a pair of parallel bars, with each parallel bar having horizontal extensions at their ends which are received in horizontal sleeves. The horizontal sleeves are each supported by telescoping vertical column supports, and telescoping vertical drive shafts connect with the horizontal sleeves and transmit a drive to the horizontal extensions to drive the extensions and the parallel bars attached thereto forwardly and rearwardly along a horizontal plane. Each of the telescoping vertical columns has a drive to telescope the vertical columns upward and downward to thereby raise and lower the parallel bars. A pair of motors drive a pair of chains respectively with one chain driving the vertical telescoping column supports simultaneously and in unison and the other chain driving the vertical drive shafts to move the horizontal extensions horizontally and thereby move the parallel bars horizontally.
A second endless link chain 63 passes around gears 39, 40, 41 and 42 which gears drive the square rods and sleeves 35, 35', 36, and 36' and thereby rotating the telescoping drive members which rotates the gears 43 at the upper end of each telescoping drive members and the rotation of gears 43 drive the horizontal extensions 32, 32', 33, 33' relative to sleeves 28, 28', 29, and 29' and thereby move through the bars 30 and 31, fixed to the end of the sleeves 32, 32' and 33 and 33', respectively. Gears 41 and 42 each have a pair of idle gears 64 and 65 and 65' which guide the chain 63 about the opposite side of gears 41 and 42 with respective gears 39 and 40 thereby driving gears 39 and 40 in the opposite direction to gears 41 and 42 to cause the horizontal extensions 32 and 32', and 33 and 33' to project and retract relative to sleeves 28, 28', 29, and 29' and thereby cause the parallel bars 30 and 31 to move in a direction toward and away from one another. A reversible motor 67 has a toothed gear 68 mounted to its motor shaft and the toothed gear 68 meshes with toothed gear 69 which gear 69 meshes with the endless link chain 63 to drive the chain 63 in either direction to move the parallel bars 30 and 31 horizontally, the sleeve 28 has limit switches 70 and 71 which are normally closed, which stop the motor 61 when the extensions 32, 32', 33 and 33' reach their fully retracted and fully telescoped position, respectively. Manually operated switches 75, 75' and 75'' are connected together mechanically so that they move in unison either to the left or right when viewed from FIG. 8 to operate the bars 30 and 31 horizontally; the operator will move switches 75, 75' and 75'' either to the left or right in unison and he will then close the start switch 76. If he moves the switches 75-75'' left, the motor 67 will drive in one direction and will retract the extensions 32, 32', 33 and 33' simultaneously until sleeve 32 engages switch 70 and opens it by engaging it. This turns off the motor 67, until the operator moves the switches 75, 75' and 75'' to the right, which movement reverses the leads to the motor 67 and drives the motor 67 in the other direction which telescopes the extensions. As soon as extension 32 moves away from switch 70, switch 70 will spring back closed again. The driving of the lower 67 in the other direction telescopes the extensions 32, 32', 33 and 33' until the end 74 of extension 32 moves from left to right, as viewed from FIG. 2, past switch 71 allowing switch 71 to open. The opening of switch 71 again turns off motor 67, until the switches 75, 75' and 75'' are again moved to the left, when viewed from FIG. 8.

The motor 67 is of a conventional type which can be reversed by reversing the leads 77 and 78 to its winding 79. The bars 30 and 31 thus can be telescoped toward or away from one another, by switching the switches 75, 75' and 75'' to either the left or right depending upon the desired direction and then turning on switch 76, until the bars reach their desired position, at which time the switch 76 will be opened again, turning off motor 67 and thus stopping the horizontal movement of the bars.

Similarly, to telescope the parallel bars upward or downward, the sleeve 24 has limiting switches 80 and 81, which are normally closed, and which stop the motor 60 when the upper sleeves 60 reach their fully retracted and fully telescoped positions respectively. Manually operated switches 82, 82' and 82'' are connected together mechanically so that they move either left or right as viewed from FIG. 8. To operate the bars vertically, the operator will move switches 82, 82' and 82'' either to the left or to the right in unison and he will then close the start switch 83. If he moves the switches 82-82'' left, the motor 60 will drive in one direction and will drive the upper sleeves 24, 24', 25 and 25' simultaneously until the lower end 26' of the upper sleeve 26 of the column 24 engages switch 80 and opens it by engaging it. This turns off the motor 60 until the operator moves switches 82, 82' and 82'' to the right which reverses the leads to the motor 60 and drives the motor in the other direction to fully telescope the lower sleeves 26. As soon as sleeve 26 of column 24 moves away from switch 80, switch 80 will spring back closed again. The driving of the motor 60 in the other direction telescopes the upper sleeves 26 out of the lower sleeves 27 of the supports 24, 24', 25 and 25' until the end 26' of the extensions 32, 32', 33 and 33' again moves up past switch 81, allowing switch 81 to spring open. The springing open of switch 81 again turns off the motor 60, until the switches 82, 82' and 82'' are again moved to the left, when viewed from FIG. 8.

The motor 60 is also of a conventional type which can be reversed by reversing the leads 84 and 85 to its winding 86. The bars 30 and 31 thus can be telescoped under power upward or downward by switching switches 82, 82' and 82'' either to the left or right depending upon the desired direction of movement and then turning on switch 83 until the bars reach their desired height, at which time the switch 83 will be opened again turning off motor 60, and thus stopping the vertical movement of the bars.

Thus it will be seen that a novel motorized parallel bar invention has been provided which bars can be immediately adjusted by motors toward and away from one another and up and down to adapt the device to the needs of various patients for therapy treatment.

It will be obvious that various changes and modifications may be made to the invention without departing from the spirit and scope thereof and accordingly it is not intended that the invention be limited to that specifically described in the specification or illustrated in the drawings but only as set forth in the appended claims wherein:

1. A parallel bar device for therapy treatment comprising a platform, a pair of parallel bars, telescoping vertical members and telescoping horizontal members on said platform and supporting said parallel bars, said telescoping horizontal members being mounted to said telescoping vertical members, drive means acting to telescope said vertical members to raise and lower said parallel bars, extendable drive means adjacent said vertical telescoping members acting to telescope said horizontal members to move said parallel bars toward and away from one another, motor means selectively operable to transmit drive to said drive means of said telescoping vertical members and to said extendable drive means for powering the movement of said vertical and horizontal members.

2. A parallel bar device for therapy treatment comprising a platform, a pair of parallel bars, telescoping vertical members and telescoping horizontal members on said platform and supporting said parallel bars, said telescoping horizontal members being mounted to said telescoping vertical members, drive means acting to telescope said vertical members to raise and lower said parallel bars, a motor powering said drive means, vertical telescoping drive shaft means mounted adjacent said horizontal telescoping members and acting to telescope said horizontal members to move said bars toward and away from one another, a second motor with means connecting said second motor to said vertical telescoping drive shaft means for powering said vertical telescoping drive shaft means.

3. A parallel bar device for therapy treatment comprising a platform, a pair of parallel bars, telescoping vertical members and telescoping horizontal members on said platform and supporting said parallel bars, said telescoping horizontal members being mounted to said telescoping vertical members, drive means acting to telescope said vertical members to raise and lower said parallel bars, a motor powering said drive means, a second drive means acting to telescope said horizontal members to move said parallel bars toward and away from one another, said
first drive means including an endless chain driven by said first motor with gear driven connecting means connecting said endless chain to said telescoping vertical members, said second drive means including another endless chain driven by said second motor with a second gear driven connecting means said other endless chain to said horizontal telescoping members.

4. A parallel bar device according to claim 2 wherein said second connecting means comprises vertically extendable drive shaft means mounted adjacent said telescoping vertical members.

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