

[54] **ORTHOPEDIC TRACTION TABLE**

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[58] Field of Search 128/71, 72, 73, 74,
128/75, 70, 25 R; 269/322-326

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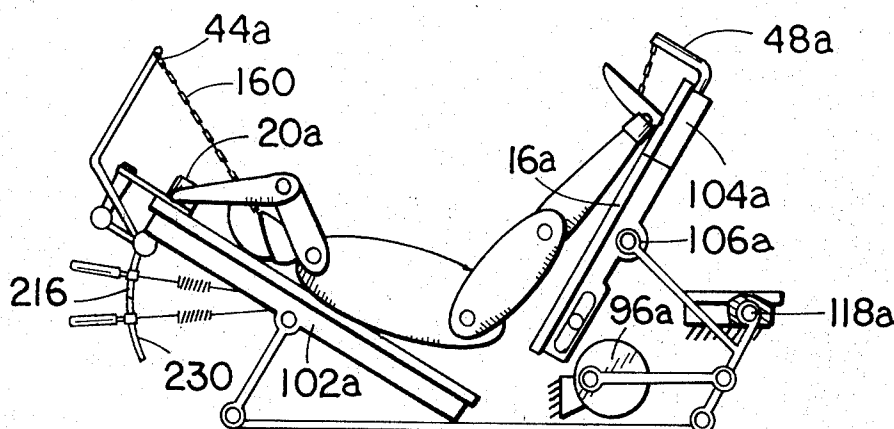
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ABSTRACT

An orthopedic table is disclosed by which a patient's spine, shoulders and hamstrings may be placed in traction in a degree that is partly related to his size and weight. The patient is harnessed to the head and foot ends of the table while lying substantially horizontal. Thereafter, the central region of the table is lowered by tilting of its upper and lower sections whereby the patient's weight is removed from the table in part and transferred to the harnesses. To aid in accomplishing a desired distribution of reaction forces within the patient, the apparatus operates to pull the patient's legs upwardly in the direction of their length. The apparatus by which the patient's head and arms are harnessed to the table is made yieldable in varying degree so that the table operator can adjust the relative amount of force applied to the patient's head and shoulders and to enable him to adjust the absolute amount of those forces.

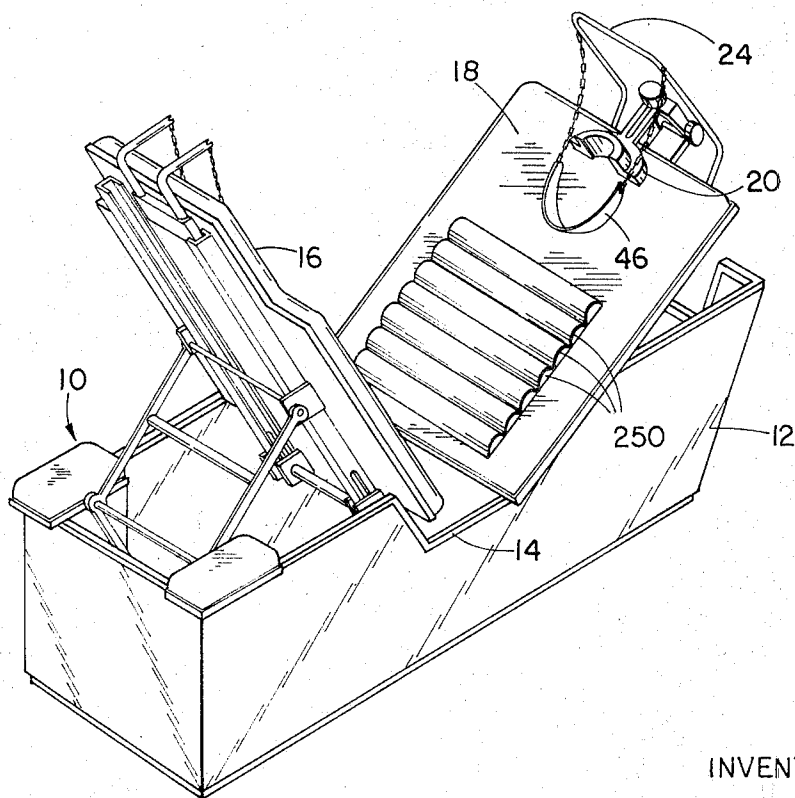
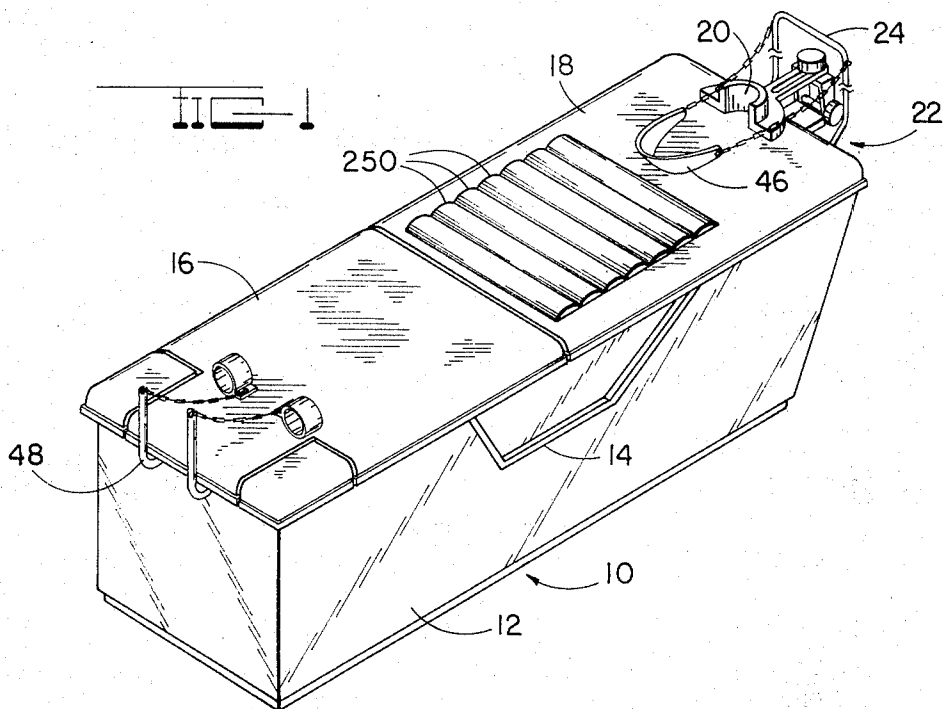
10 Claims, 13 Drawing Figures



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SHEET 1 OF 4



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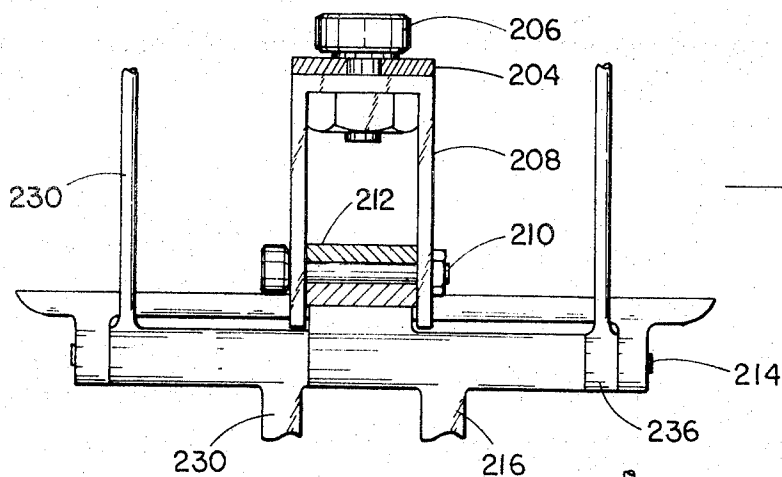
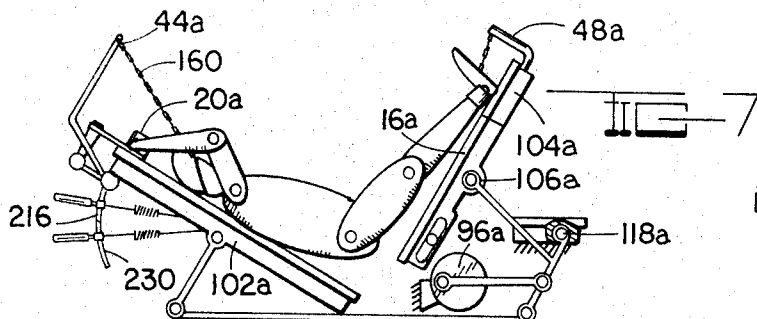
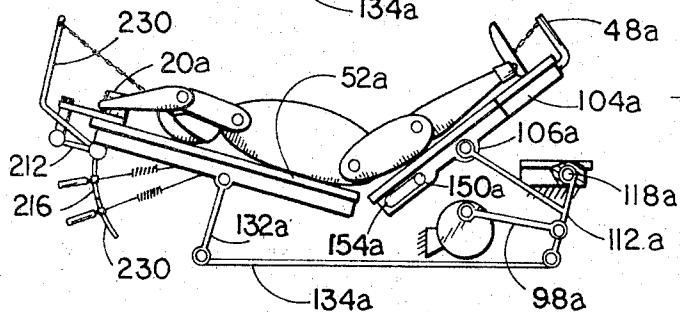
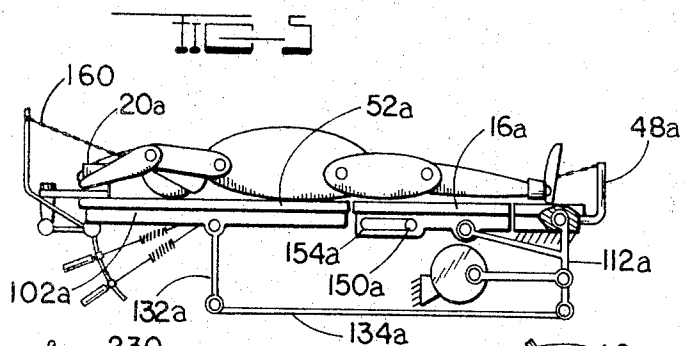
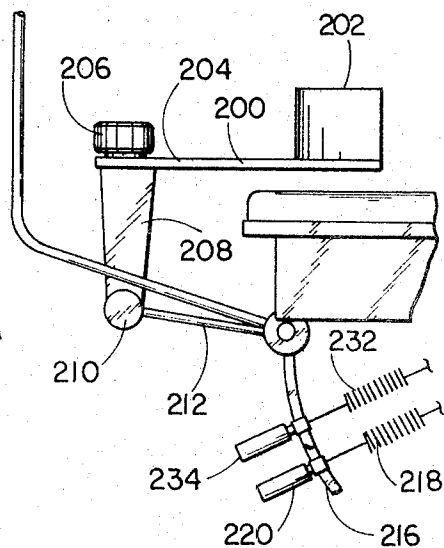


FIG. 4



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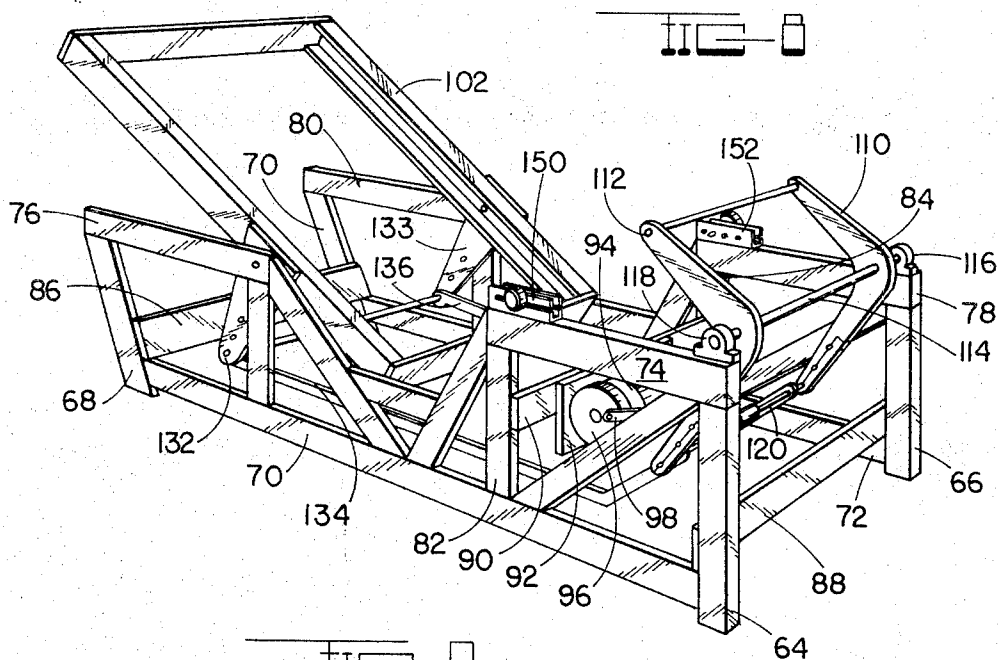


FIG. 1

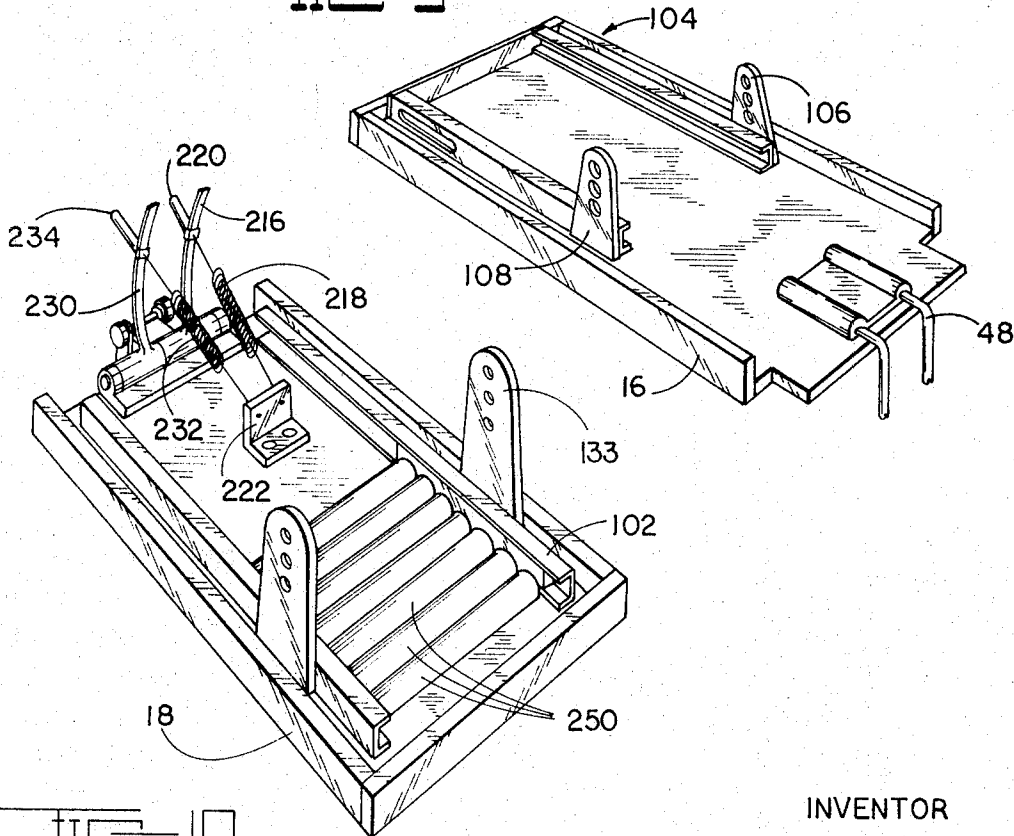
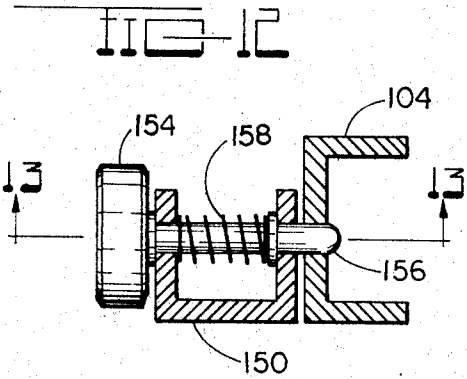
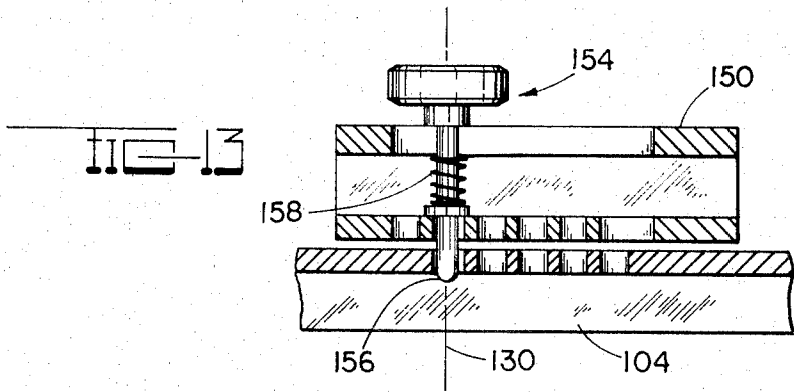
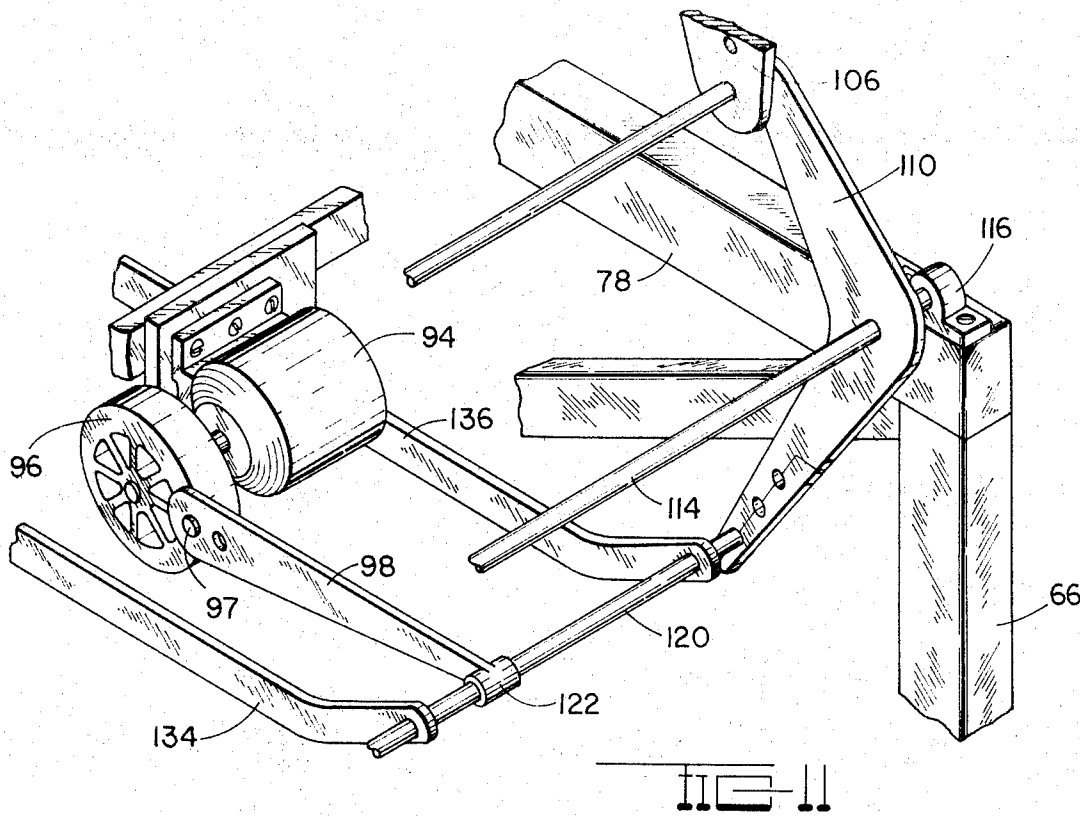


FIG. 2

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ORTHOPEDIC TRACTION TABLE

This invention relates to improvements in orthopedic appliances and it relates particularly to improvements in orthopedic intermittent traction tables.

Pathology involving the cervical spine, shoulders, and low back is usually followed by contractures or tightness of the soft tissues related to the involved areas. Some loss of flexion and rotation of the neck often results along with loss of flexion and abduction of the shoulder, and loss of flexion in the low back with shortening of the hamstrings. Relieving these contractures, to recover normal motion, is the most effective treatment in relieving the symptoms and is often the most effective treatment in preventing progression of the pathology. The invention relates to an apparatus that aids in relieving such contractures. It aids particularly in stretching of contracted tissues and hamstrings and its object is to provide an improved apparatus for that purpose. Presently available apparatus produces straight, in-line traction with no physical means for improving joint motion.

It has been found that improved traction is effectively and safely accomplished by application of a force that is related partially to the patient's weight, by pulling his torso and feet in a direction opposite the pull on his arms and by pulling his head to stretch his neck in the direction in which his arms are pulled. The apparatus of the invention pulls the patient's arms and head upwardly against a downward pull on the lower portion of the patient's body. The arrangement permits proportional control of the amount of the force applied to the head relative to that applied to the remainder of the body. Pulling upwardly on the arms makes it possible to apply tension over the full length of the patient's body from arms to feet without the application of undue force to the patient's neck. It is important to recognize that it is not desirable to simply stretch the patient by pulling on his hands at one end and his feet at the other. The stretching force that is applied to the several parts of the body along its length is advantageously different. Greater force is safely and advantageously applied to the legs than is applied to the back and shoulders of the patient. Nonetheless, it is preferred that all of these several parts of the body be pulled simultaneously for several reasons. First, such simultaneous pulling minimizes the number of points at which the force application apparatus must be attached to the patient. Additionally, it reduces treatment time. The need for an apparatus arises when the degree of force to be applied exceeds what can be conveniently or safely applied in self-exercise. Since attendance of a professional is obviously preferred when force is large or unusual, it is advantageous to reduce treatment time. Also, the application of force simultaneously over the full length of the patient tends to result in the dissipation of that force at the points offering greatest resistance and which most needs the stretching regardless of where they occur over the body's length.

The invention provides an apparatus by which this method is practiced generally. The method it provides is refined somewhat in that the forces are applied at a rate and in a sequence that minimizes patient discomfort and apprehension. The forces are added until all are applied simultaneously. To accomplish these results is another object of the invention.

In the preferred embodiment, the patient lies face up upon a generally horizontal table which is divided lengthwise into two parts which, for convenience, are called the upper part and the lower part, because they underlie the back and legs of the patient respectively. The patient is ordinarily positioned with his lower back and upper portions of his body resting on the upper part with his arms extending over his head and crossed there in the region of his wrists. The arms are held in that position by an upper holder. His head is held to the upper holder by a harness that extends under his occiput and chin. A lower holder is fastened to the patient's feet or legs. In the preferred embodiment, the upper holder is carried by the upper table part and the lower holder is carried by the lower table part. They are spaced horizontally, of course, and may be at the same height. In the preferred embodiment, the two holders are elevated in the process of stretching the patient. The foot or lower holder is elevated a greater amount. This is a desirable but not a critical feature.

The patient is stretched under his own weight, or rather part of his own weight, by lowering the table parts. Alternatively, the holders are raised or, as in the preferred embodiment, both table parts are tilted so that the holders are elevated higher than the portions of the table parts below the patient's middle section. He is held by his arms, and in part by his occiput and chin, at one end and by his feet or legs at the other end. The table parts are tilted so that the patient's weight is used partially to apply the force but they are tilted at an angle and about an axis which results in the application of a different stretching force to the back than what is applied to the legs.

The table is ordinarily not lowered so much that all of the patient's weight is transferred to the holders. Instead, the table is tilted so that the body tends to bend at the waist with the spine curved as it does when bending over and so that the legs tend to bend backward into locked position. First the lower back and then an increasingly greater portion of the torso is lifted in some degree from the upper part of the table whereby weight is transferred gradually to the holders primarily through the arms and legs but also through the neck as the arms are made to stretch. In the preferred method the patient's hips and lower back lose contact with the table. The body stretches down from the upper holders so contact is only partially maintained and body weight is transferred to arms and neck. However, the feet are elevated to a higher point and in the preferred embodiment, the lower table part moves away from the patient's buttocks and thighs so that the pull along the length of the leg is relatively great. The patient finally assumes a position in which his legs form an angle approaching ninety degrees with his back in the preferred method. Also, in the preferred method, the patient's torso is free to move down the tilted upper portion of the table with a minimum of friction whereby the proportion of his weight that is borne by the neck and arms is rather directly related to tilt angle of the table. The table is adjusted so that its upper part moves to an angle about thirty degrees to the horizontal and the lower part is tilted to about 60°. In the preferred embodiment, those angles are adjustable and the total angle of the table parts is adjustable.

The invention provides steps and means for accomplishing all of these functions. In addition, the preferred method, and the apparatus by which that method is

practiced, controls the order and the rate of force application. It is desirable that the transition between force application and force release be gradual to avoid discomfort and apprehension and for circulatory purposes. Also, it is preferred that force application be cyclic so that rest periods alternate with tensioning periods. It is preferred that the cycle include a short dwell period of high force in each cycle. To provide that kind of force application is another object of the invention. Such a cycle is provided in the preferred embodiment by converting uniform rotational motion of a motive means into a rocking motion of the table parts that is nearly sinusoidal in the case of the upper table part and which approaches sinusoidal movement in the case of the lower table part. However, the movement of the foot end of the lower part traces a cyclic curve whose peaks are sharper, and whose troughs are shallower, than sinusoidal. These motions are produced in the preferred embodiment by rotating the upper table part about a fixed axis close to the plane of the table when horizontal and by rotating the lower table part about an imaginary moving axis located substantially above that plane. It is possible, within the invention, to achieve an equivalent result by moving both rotational axes but that results in lateral translation of the patient and a more complex structure. One of the objects of the invention is to provide an apparatus that will accomplish the result without undue cost and complication. That this result has been achieved is apparent from an examination of the preferred embodiment illustrated in the drawings. In those drawings:

FIG. 1 is an isometric view of an orthopedic table embodying the invention and is shown in a state in which a minimum amount of traction, or no traction at all, would be applied to a patient occupying the table;

FIG. 2 is an isometric view of the table of FIG. 1, its several parts having been moved to a position in which maximum traction is applied to a patient occupying the table;

FIG. 3 is a view in end elevation of a fragment of the patient holding means associated with the head end or upper part of the orthopedic table of FIGS. 1 and 2;

FIG. 4 is a view in side elevation of the apparatus of FIG. 3 mounted on a fragment of the upper table part;

FIGS. 5, 6 and 7 are schematic representations of the major working parts of the table showing the position of those parts relative to one another and to a patient occupying the table during different phases of the cycle of table operation; and

FIG. 8 is an isometric view of the table with its side panels and table parts removed to expose the frame and drive mechanism;

FIG. 9 is an isometric view of the underside of the lower part of the table;

FIG. 10 is an isometric view, of the underside of the upper part of the table shown assembled with a portion of the frame of the unit and with the patient holding means;

FIG. 11 is an isometric view of a fragment of the main drive mechanism of the unit;

FIG. 12 is a cross-sectional view of a fragment of the sliding pivot mechanism of the lower table part shown from the end; and

FIG. 13 is a cross-sectional view taken on line 13—13 of FIG. 12.

GENERAL ARRANGEMENT

The general arrangement of the preferred embodiment is illustrated in FIGS. 1 and 2. The whole table is generally designated 10. Its lower portion is enclosed by a skirt 12 formed of a series of side panels. A portion of the skirt is omitted at the head end to provide access to some adjusting mechanism to be described later. That mechanism is not visible in FIG. 1 or FIG. 2 because it extends down below the top of the table. The skirt is cut away at the sides, in the region designated 14, to provide clearance for the inner ends of the upper and lower table parts when they are tilted from a horizontal position shown in FIG. 1 to the elevated position shown in FIG. 2. The lower table part is generally designated 16. The upper table part is generally designated 18.

At the beginning and end of an operating cycle, those table parts 16 and 18 are arranged horizontally as they are shown to be in FIG. 1. During the cycle of operation, they are tilted. In FIG. 2 they are shown tilted to near maximum position. The patient to be treated lies on the table with the upper part of his body on the upper part 18 of the table and with the lower part of his body on the lower part 16 of the table. His arms are stretched to a position above his head and are crossed so that they extend around the arm holder portion 20 of the upper holder 22. In preferred form, the table and the arm holder are sized so that the patient's arms will cross approximately in the region of his wrists. The upper holder also includes a head holder portion 24 to which an occiput and chin harness 46 is attached. That harness is secured to the U-shaped portion of the holder and it extends under the patient's head and chin. The length of the upper section 18 of the table is such that it underlies his head and the whole of the patient's back. His legs and feet rest on the lower portion 16. His feet are secured, usually by his ankles, to a lower holder 48 whose position and harness length are adjustable whereby patients of different height can be accommodated. Both the method and the apparatus are arranged so that no adjustment other than position of the upper arm holder 20 and the length of the harness straps that secure the harness of foot holder 48 and that secure head harness 46 is required to accommodate patients of different size.

Lying on the table with his arms folded over the arm holder, his head in the head harness and his feet secured in the feet harness, the patient is ready for the application of tension. That tension is applied in this embodiment by lowering the inner end of both table sections while raising the outer ends. The foot end of the table is made to move upwardly in the direction of its length as it tilts up. This maintains tension on legs and hamstrings. It is advantageous to alternate application of tension forces with a rest period. Doing that permits the safe and tolerable application of relatively great tensioning forces. The invention applies maximum tension for a short period called a "dwell" period. However, the force is not actually maintained at a uniform level over a dwell period. Instead, it changes continually but the degree of change in the high tension "dwell" period is less than the degree of change during the remainder of the cycle. This is accomplished in the invention by tilting the table parts so that the patient is bent with his legs at an angle near 90° to the plane of

his back and then by moving the table to carry the legs upwardly without appreciably changing the angle.

In this embodiment, that kind of motion is accomplished by pivotally mounting the lower table on an arm which is itself pivoted for rotation about an axis spaced a substantial distance from the connection of the table and arm. In the particular structural arrangement employed in the embodiment shown in the drawings, the axis of arm rotation is advantageously no less high than the axis of table rotation relative to the arm when the table is in horizontal position. In this case, the pivot point of arm rotation is elevated to the level of the table itself. The two corner portions 60 and 62 act merely as a covering over the arm pivot structures as best shown in FIG. 2. Those corners are part of the base.

FRAME AND DRIVE

The frame and the apparatus by which the table parts are moved are best shown in FIG. 8. The frame includes four corner posts. Posts 64 and 66 are located at the lower or foot end on the near and far sides, respectively, in FIG. 8. The legs 68 and 70 are located at the near and far sides, respectively, at the upper or head end of the unit in FIG. 8. The legs at the near side of the frame in FIG. 8 are connected by a lower side rail 70 and at the far side by lower side rail 72. The upper side rails are not continuous because of the need to accommodate downward tilt of the inner end of each of the table sections. Thus the near side of the frame has its upper rail divided into a foot end upper rail 74 and a head end upper rail 76. The foot end rail part on the far side is numbered 78 and the head end upper rail at the far side is numbered 80. Among the several braces that interconnect the upper and lower side rails, there is a vertical post at each side that extends downward from the upper end of the foot end upper rails. The vertical section on the near side is identified by the numeral 82. The other is only partly visible and is numbered 84. There are three cross members that connect the two sides of the frames. The one at the head end is numbered 86 and the one at the foot end is numbered 88. The third one 90 interconnects the vertical posts 82 and 84. It has been pointed out specially because it is this cross brace on which the motor mount plate 92 is mounted. The drive motor is combined with a reduction gearing unit. The combination is identified by the reference numeral 94. The output of that unit rotates a crank 96 which in this case has the form of a circular disk. It is coupled to the motor drive unit at its central axis and it carries a pivot pin 97 (see FIG. 11) parallel with the central, drive axis at a point on the disk removed from the central axis. A main drive rod 98 is coupled to that pin and motion of the drive rod is made to tilt the two table sections.

Each of the table's sections is mounted upon a subframe. The upper table section subframe is identified by the numeral 102. It is shown assembled with the remainder of the frame in FIG. 8 and it is shown again in FIG. 10 where it is assembled with the upper table.

The subframe of the lower table part is numbered 104. It is not shown in FIG. 8 but it is shown in FIG. 9 assembled to the lower part 16 of the table. It includes two brackets 106 and 108 by which it has pivotal connection to a pair of L-shaped arms 110 and 112 which are mounted in parallel upon a pivot rod 114. The pivot rod is pivotally connected to the upper frame rails at the foot end by a pair of pillow blocks 116 and 118.

These same L-shaped arms are interconnected at their opposite ends by a drive shaft 120. The driving arm 98 is connected to that drive shaft 120 at a bearing 122. As the crank 96 rotates, its rotational motion is converted to a substantially sinusoidal oscillatory motion of the drive shaft 98 about the axis of pivot rod 114. Shaft 120 at the end of the arms 100 and 112 also moves sinusoidally about that same axis. The lower end of the arms are segmented to permit the drive shaft 120 to be located in any of several sets of pivot holes in the arms. The structure is visible in FIG. 11 where the lower end of arm 110 is shown to be segmented so it can be opened and the drive shaft relocated.

The upper table subframe 102 is made to rock in substantially an oscillatory motion as the crank 96 rotates. The subframe 102 is pivoted at pivot axis 130 to the upper side rails at the head end of the frame. Brackets or cranks 132 and 133 extend downwardly from the subframe and have pivotal connection with two long drive arms, both of which are partly visible in FIGS. 8 and 11 where the one on the near side is numbered 134 and the one on the far side is numbered 136. At the foot end of the unit, these long rods have pivotal connection to the drive shaft 120. Thus it is that the motor and reduction gear unit 94 is made to drive both table subframes, and the table parts associated with them, in a coordinated fashion.

The upper table subframe 102 simply rocks in an oscillatory motion through an angle of about 30° in this preferred embodiment although that angle is easily changed by connecting the long drive rods 134 and 136 to another pair of the several pivot points shown to be incorporated in the brackets or cranks 132 and 133. At the opposite end of the unit, the degree of motion imparted to the subframe 104 of the lower table unit can be altered by connecting the arms 110 and 112 to different ones of the several pivot points that are shown to be included in the cranks 106 and 108.

To change motion of the two table sections proportionally to one another, the drive shaft 120 is simply moved to another pair of the several pivot points that are shown to have been provided in the lower ends of the two L-shaped arms 110 and 112.

There is still another variable that can be altered to adjust the degree and character of the movement of the lower table section. The effective pivot for that table rotation is made to lie above the table by use of the combination of two pivot connections on the table itself. One of those connections has already been described and it is the pivotal connection between the arms 110 and 112 and the frame brackets 106 and 108 of frame section 104. The other pivotal point also moves relative to the main frame. In FIG. 9 the two side channels of subframe 104 are shown to be formed with an elongate slot toward the inner end of the lower table part. Those slots receive the respectively associated end of the two retractable pivot pins that are carried in channels fixed to the upper side rails. The channels are numbered 150 and 152 in FIG. 9. These elements are shown in greater detail in FIGS. 12 and 13. The pin 154 is formed with a large head that serves as a handle for retracting the shank 156 against the bias of a compression spring 158. The outer end of the pin slides freely in the slot of frame 104. The channel 150 has its outer wall slotted and its inner wall perforated with a series of holes formed opposite the slot. The head is pulled out to retract the shank from one hold and after the pin

is moved laterally in the slot it is inserted through another hole. Adjustment of the pin position changes the degree in which the lower end of the table moves upward along its length and is a primary means for adjusting leg and hamstring tension. Together the two structures that pivotally interconnect the lower table section and the main frame serve as a preferred form of a means for making the lower table rotate about an apparent axis which lies above the lower table section and is permitted to move upwardly and rearwardly during table operation to produce the tension peak and "dwell" action.

The apparatus includes a means for adjusting both the absolute and the relative degree in which tension is applied to arms and head. In this embodiment that means comprises the upper holder 22. It includes an arm holder in the form of a yoke consisting of a flat portion 200 on which the arms are placed and a curved wall 202 behind which the arms are crossed. A rearward extension 204 of flat portion 200 is slotted longitudinally, as best seen in FIGS. 1 and 2, to receive a clamping bolt 206 which clamps the extension to a U-shaped bracket 208. That bracket is held by a pivot pin and clamp nut combination 210 to one end of a lever 212 which is pivoted at an intermediate point on main pivot pin 214. A curved, downward extension 216 of lever 212 carries one end of a bias spring 218 by which the lever 212 and the whole arm holder is biased to the counter-clockwise position it occupies in FIGS. 4, 5 and 10. The bias spring extends from a handle 220 carried by the extension 212 to a fixed connection 222 on the underside of upper table section 18. Changing the position of handle 220 changes the degree in which the spring 218 is stretched whereby the bias of the arm holder is adjusted. A second lever 230 has a similar downward extension from its connection to the same main pivot pin 214. This lever is also biased counter-clockwise against a stop (not shown). The bias spring 232 extends from adjustable handle 234 to the bracket 222. The other end of lever 230 is U-shaped. It extends upwardly behind the arm holder and then back down to another pivotal connection at 236 to the main pin 214. This assembly together with the head harness 46 (FIG. 1) is the head holder 24.

The bias with which the head holder 24 and arm holder 20 hold the patient is adjustable by positioning the respectively associated ones of handles 234 and 220.

The several rollers 250 at the lower end of the upper table section are freely rotatable, padded and closely spaced so that they obviate the friction that might otherwise impede movement of the patient down against the bias of the upper arm and head holders when the table is tilted. They help also in permitting the patient to return to the initial zero tension starting position at the end of each cycle of table movement.

FIGS. 5, 6 and 7 are schematic diagrams of the action of the working parts of the table as they appear at different times in the cycle of table operation. The manikin in those figures has proportions approximating those of an average human being. The apparatus in those figures includes an upper subframe 102a, an arm holder 20a, a head bracket 44a, an upper table 52a, a lower subframe section 104a slotted at 154a and a pin 150a extending through that slot and serving as a pivot axis, a lower table section 16a, a foot holder 48a, an operating arm 112a secured to the frame at a pivot 118a

and secured to the lower frame section 104a at a bracket 106a, a drive motor crank 96a, a main operating rod 98a connected from the motor output crank 96a to the lift arm 112a, an upper table crank 132a, and a long operating rod 134a which transfers motion from the L-shaped arm (here T-shaped) 112a to the upper table crank 132a. The manikin has its arms raised over its head and folded across the arm holder 20a. The head harness 46a under and around the manikin's head and chin is tied by flexible cord 160 to the head holder 44a.

The manikin's head, torso and hips rest on the upper table. The legs rest on the lower table and the feet are secured at the ankles to the foot holder 48a. The table is horizontal in that initial condition illustrated in FIG. 5. The lower table is positioned such that the pin rod 150a, which is attached to the frame and serves as a pivot for table movement, is at the extreme right end of the slot 154a. It remains in that position as illustrated in FIG. 6 when the crank 96a has rotated through an angle of 90°. The several lever arms and pivot points are arranged so that the lower table has tilted to an angle approximately twice that of the upper table. Separation between the holders is now somewhat less than it was initially. The patient's body has begun to fold in a way that applies most of his weight to the upper table. The table being tilted, the patient's weight can be divided into two force components; a vertical component and a lesser horizontal component toward the right, in FIG. 6. In FIG. 6 that horizontal component has just begun to force the torso away from the upper holders. The effect of that separation is to increase the traction applied to the arms, shoulders and upper spine of the manikin. In FIG. 7 the table is tilted in further degree so that the horizontal component of the force applied to the table by the weight of the patient has increased to a greater degree applying a substantial amount of traction to the arms and shoulders and upper spine whereby the arm and head holders have rotated clockwise slightly. In FIG. 7 the whole lower table 16a has been lifted as evidenced by the fact that the pivot axis 150a now occupies an intermediate position along the slot 154a. The patient's legs have been pulled upwardly so that his hips are pulled partially away from the upper table section 52a. His back is curved and strong tension related to his weight is applied to his hamstrings.

FIG. 7 represents the extreme traction position. The main motor crank 96a has rotated through an angle of 180° and further rotation will move the apparatus to the position illustrated in FIG. 6 and then return it to the initial condition illustrated in FIG. 5. The cycle of operation is such that initial movement experienced by the patient is gradual whereby apprehension is minimized. Then the rate of force application is increased at the upper body area. The forces applied to the shoulders and arms and neck are applied over a longer period in the cycle than are the forces applied to the hamstrings but the force application is not as extreme as it is to the hamstrings. The latter are stretched primarily over the short "dwell" period at mid-cycle.

The relative amount and duration of these forces, that is of the forces applied to the upper portion of the body with respect to the forces applied to the lower portion of the body, can be adjusted by the simple expedient of adjusting the tilt angle of the two sections of the table. In preferred form, they tilt so that they are approximately at 90° to one another as illustrated in

FIG. 7. Ordinarily, if the tilt of one section of the table is decreased then the tilt of the other section is increased. This can be accomplished readily by adjusting the location of the pivot points at the intersection of the crank 32 and long lever 134 of FIG. 8 and at the pivotal interconnection of the long lever 134 and the L-shaped arm 112 and by adjusting the position of pivot pins 150 along the frame rails. Production models are arranged so that the table operator can alter those pivot points with relative ease to accommodate the need in different patients for a different degree of tensioning.

However, the primary control of degree of tension that is applied to a patient is exercised by adjusting the bias with which movement of the arm and head holders is opposed. The tension that is actually applied to the shoulders and arms and neck of the patient depends upon the degree in which his torso moves away from the upper holder. In general then, the amount of tension that is applied at the upper portion of the patient's body is determined by the bias of arm holder bias spring 218. To a lesser extent it is determined by the bias of head holder spring 232.

The several features of the invention provide a number of advantages which may not be immediately obvious. For example, it is often helpful if the patient's head is held turned to one side during treatment. The structure includes a means by which this may be accomplished. In FIGS. 1 and 2 the head harness 46 is connected to holder 24 by two plyant chains or cords. The cords are connected to opposite sides of the U-shaped holder by a connection that can be moved up and down those arms to a selected position. In these Figures they are both connected at an upper level. If one is moved down the arm the harness will tend to rotate and hold the patient's head in rotated position. Reversing position of the connections results in opposite rotation of the patient's head.

Another advantage is that the tension applied to a patient can be further adjusted by addition of a belt secured at its ends to opposite sides of the table base and extending up over the patient. By making the belt of resilient material the range of tensions that can be applied is extended considerably. If the belt does not stretch then the tension can be more concentrated over part of the cycle.

Although I have shown and described certain specific embodiments of my invention, I am fully aware that many modifications thereof are possible. My invention, therefore, is not to be restricted except insofar as is necessitated by the prior art.

I claim:

1. In an orthopedic table for treating a patient by the application of forces tending to elongate portions of his body:

upper holding means for holding the patient at the upper portion of his body by at least one of his head and his arms;

lower holding means for holding the patient at the lower portion of his body by at least one of his legs and his feet, the lower holding means being disposed in a position removed horizontally from the upper holding means; and

adjustable supporting means intermediate said upper and lower holding means for supporting, in variable degree, the torso of a patient being held by said upper and said lower holding means, said supporting means comprising a table divided in the mid-

region of its length into an upper part disposed to underly the back of a patient and a lower part disposed to underly the legs of a patient, and a tilting means for tilting the upper and lower table parts oppositely about spaced pivot axis and for imparting motion to said lower holder to increase its separation from said upper table part as the table parts are tilted.

2. The invention defined in claim 1 in which the upper portion of said table is movable in the direction of its length away from said upper holding means when tilted.

3. The invention defined in claim 1 in which said upper holding means comprises an arm holder over which a patient may fold his hands and arms and comprises a head harness.

4. The invention defined in claim 3 in which said head harness is resiliently mounted for yieldability in the direction of the lower end of the upper part of said table.

5. The invention defined in claim 3 in which said upper table comprises a torso portion adapted to underlie a patient's back and in which said head harness and said arm holder are movable relative to said torso portion in the direction of its length.

6. The invention defined in claim 5 in which the head harness and arm holder are capable of relative movement in the direction of the length of said torso portion and are resiliently biased toward a given position relative to said torso portion.

7. The invention defined in claim 1 in which the lower holder is fixed to the lower table part and in which that part is moved generally in the direction of its length away from the upper table part as the table parts are tilted.

8. An orthopedic table for treating a patient lying on the table by the application of forces tending to elongate portions of his body, comprising:

upper holding means for holding the patient at the upper portion of his body by at least one of his head and his arms;

lower holding means disposed at a position removed horizontally from the upper holding means, for holding the patient at his lower extremities; and

adjustable supporting means intermediate said upper and lower holding means for supporting, in variable degree, the torso of a patient being held by said upper and said lower holding means and comprising a table divided in the mid-region of its length into an upper part disposed to underly the back of the patient and a lower part disposed to underly the legs of the patient;

said adjustable supporting means further comprising means for utilizing said upper and lower table portion such that the central region of the table is lowered and such that the ends of the table and said holding means are elevated and such that the lower holding means is displaced in substantially the direction of the length of said lower table section away from the mid-region of the table.

9. Said invention defined in claim 8 in which said adjustable supporting means further includes means for increasing the separation in the horizontal direction of the upper and lower table sections when said sections are tilted.

10. The invention defined in claim 8 in which said lower holder is fixed to said lower table section and in which said means for displacing said lower table lower holder comprises means for displacing said lower table section in the direction of its length.

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