

March 10, 1964

J. M. SPINKS

3,124,126

ORTHOPEDIC TRACTION APPARATUS

Filed Jan. 27, 1961

4 Sheets-Sheet 1

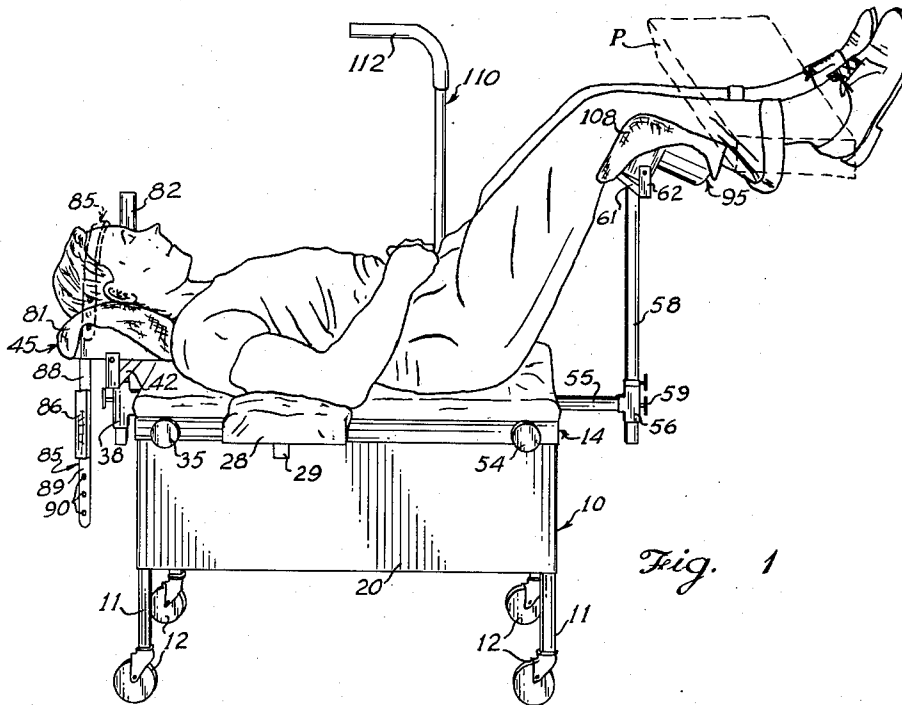


Fig. 1

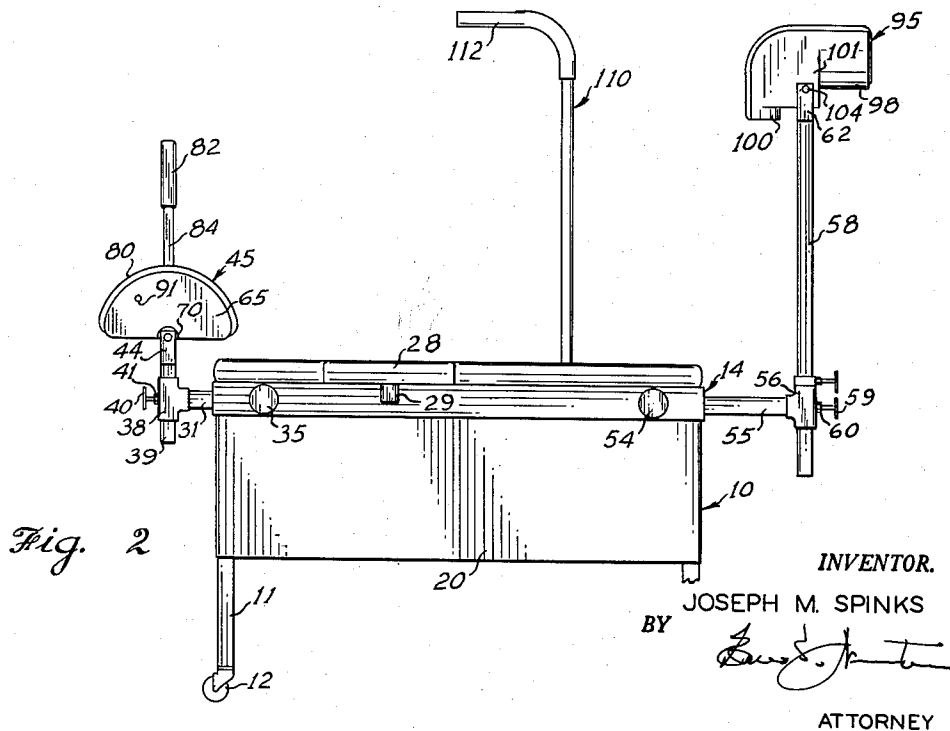


Fig. 2

INVENTOR.

BY JOSEPH M. SPINKS

Joseph M. Spinks

ATTORNEY

March 10, 1964

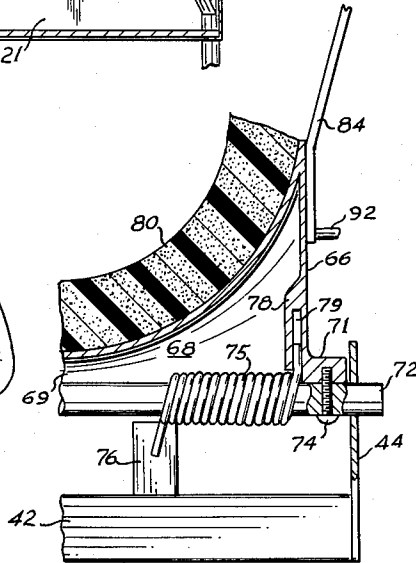
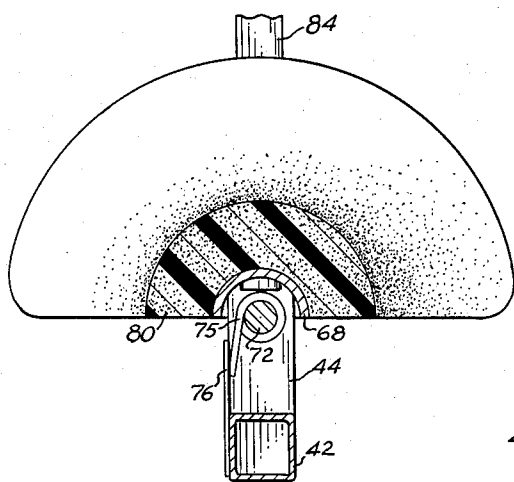
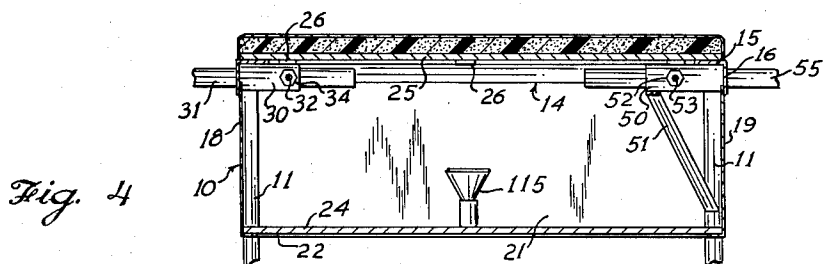
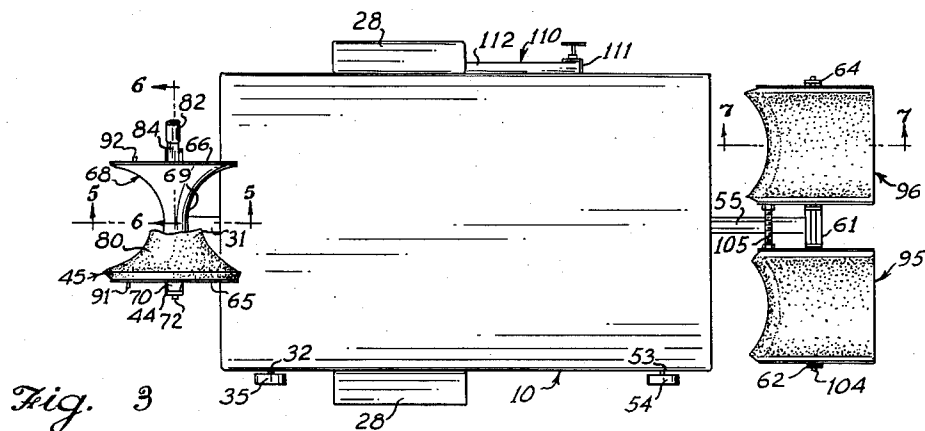
J. M. SPINKS

3,124,126

ORTHOPEDIC TRACTION APPARATUS

Filed Jan. 27, 1961

4 Sheets-Sheet 2



INVENTOR.
JOSEPH M. SPINKS
BY *Joseph M. Spinks*
ATTORNEY

March 10, 1964

J. M. SPINKS

3,124,126

ORTHOPEDIC TRACTION APPARATUS

Filed Jan. 27, 1961

4 Sheets-Sheet 3

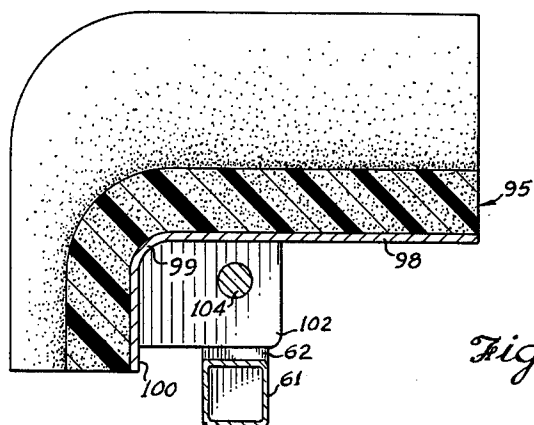


Fig. 7

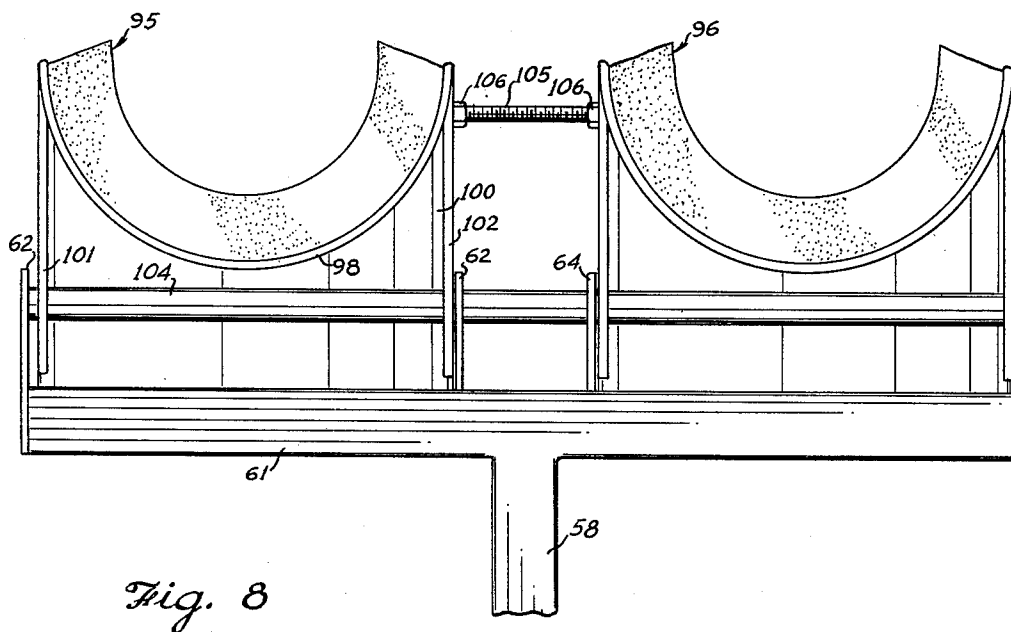


Fig. 8

INVENTOR.
JOSEPH M. SPINKS

BY

AT TORNEY

March 10, 1964

J. M. SPINKS

3,124,126

ORTHOPEDIC TRACTION APPARATUS

Filed Jan. 27, 1961

4 Sheets-Sheet 4

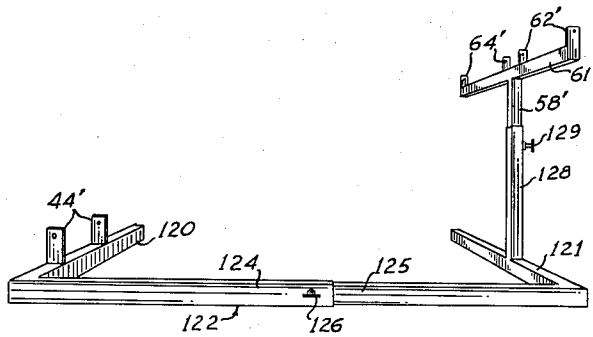


Fig. 9

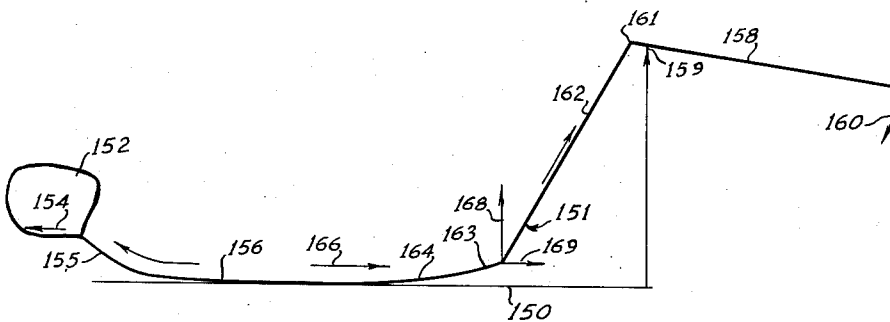


Fig. 10

INVENTOR.

JOSEPH M. SPINKS

BY

Joseph M. Spinks

ATTORNEY

1

3,124,126

ORTHOPEDIC TRACTION APPARATUS

Joseph M. Spinks, 584 Manford Road SW., Atlanta, Ga.

Filed Jan. 27, 1961, Ser. No. 85,298

2 Claims. (Cl. 128—71)

This invention relates to orthopedic traction apparatus, and is more particularly concerned with a traction device which will apply traction to both lumbar region and cervical region of the spinal column.

In the past, many attempts have been made to apply needed traction to regions of the spinal column in such manner as to allow the patient to be comfortable and to decrease the possibility of restricting blood circulation or causing skin necrosis.

To apply cervical traction, the most popular method in the prior art has been the use of a head halter which, though effective in applying desired traction, has the undesirable feature of applying pressure to the face, and especially the chin. In addition to the discomfort caused by having the head strapped, prolonged use of the head halter may cause skin necrosis on the chin, or ingrown hairs in the face of male patients. In any event, the chin cannot receive over five to six pounds of pressure. The head itself weighs approximately ten pounds; therefore, with such an arrangement, the weight of the head is not fully picked up, and no traction is applied to the neck. The Crile type head halter may overcome some of the above mentioned objections; however, continued use of the head halter may cause ischemia of the skin in the occipital region, which is the area of almost the entire force. The Crutchfield tongs or the Barton tongs may be used in cases in which the patient cannot stand the pressure of a head halter; but, both these tongs, being skeletal traction devices, require surgery to put them in place.

In addition to the above difficulties in applying cervical traction, the usual means of applying the desired force to the head halter or the tongs is to attach a cord to the head fixture, run the cord over a pulley, and suspend weights on the cord. Though, in theory, the practice is sound, in actual use the pulleys used have been very inefficient, frequently as little as 50% efficient.

In the application of traction to the lumbar region of the spinal column, difficulty has been encountered primarily because of the frictional drag of the legs. It has been found to be inadvisable to apply the force directly to the legs because the ligaments tend to stretch permanently. The use of a pelvic girdle has been recommended; however, the girdle may cause bruises or abrasions if not properly fit. In addition, the frictional drag of the legs requires that a considerably larger weight be used than should be necessary for the desired traction.

All of the above mentioned traction devices pull the spinal column either axially or bend it backwards slightly, which may, in many instances, increase the agony of the patient rather than give immediate relief.

The device of the present invention overcomes the above mentioned undesirable features by providing a head cradle to hold the head of the patient either primarily or entirely by friction. The force is exerted over a large area of the head and neck, allowing a decrease in the force per unit area. Also, the head cradle is covered with an easily deformable material which allows the cradle to conform to the irregularities of the head, providing both comfort for the patient and added holding force. The head cradle is so disposed as to cause the cervical region of the spinal column to curve forwardly.

On the opposite end of the device from the head cradle is a pair of leg cradles. The leg cradles are formed to fit the back of the knee, and are pivoted slightly below the

2

knee joint. The disposition of the leg cradles requires that the thighs be slanted upwardly; therefore, the weight of the lower leg and foot tends to pivot the leg cradle downwardly producing an upward pull on the thighs, hence on the pelvis. The sacral and lumbar regions of the spinal column are therefore curved ventrally while a posteriorly directed force is exerted on the lower back.

It is an object of the present invention, therefore, to provide an orthopedic traction device which will provide traction for both cervical and lumbar regions of the spinal column.

It is another object of the present invention to provide an orthopedic traction device which will provide cervical traction without the discomfort of pressure on the face or chin.

Another object of the present invention is to provide an orthopedic traction device which allows maximum comfort of the patient.

A further object of the present invention is to provide an orthopedic traction device which will provide lumbar traction without the use of uncomfortable belts, girdles or the like.

A further object of the present invention is to provide an orthopedic traction device which will provide traction along the spinal column and will stress only the dorsal muscles of the body.

And a further object of the present invention is to provide an orthopedic traction device which is simple to use, durable in construction and well designed to meet the demands of economic manufacture.

Other and further objects, features and advantages of the present invention will become apparent from a consideration of the following specification when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of one preferred embodiment of the present invention carrying a patient in position for treatment by the device.

FIG. 2 is a fragmentary side elevational view of that form of the invention shown in FIG. 1.

FIG. 3 is a top plan view of the device shown in FIG. 1.

FIG. 4 is a partial longitudinal cross sectional view of the device shown in FIG. 1.

FIG. 5 is an enlarged cross sectional view taken substantially along the line 5—5 in FIG. 3.

FIG. 6 is an enlarged cross sectional view taken substantially along the line 6—6 in FIG. 3.

FIG. 7 is an enlarged cross sectional view taken substantially along the line 7—7 in FIG. 3.

FIG. 8 is a fragmentary end elevational view of the leg cradles used on the device shown in FIG. 1.

FIG. 9 is a perspective view of a modified form of the present invention, the head cradle and leg cradles being omitted for clarity.

FIG. 10 is a schematic diagram showing the direction of the forces on a patient in the device of the present invention.

Referring now in detail to the embodiments chosen of illustrating the present invention, the device includes a body 10 supported on legs 11 provided with casters 12. The body 10 is made up of a rectangular angle iron frame 14 at the uppermost edge of the body, one flange of the angle iron being turned inwardly to form a top flange 15, and the other flange of the angle iron projecting downwardly at 16. The legs 11 are attached to the corners of the frame 14 and project downwardly therefrom. Along the lower edge of flange 16 is attached, by screws or the like, a skirt, forming walls to the body, as end walls 18 and 19 and front and rear walls 20 and 21 respectively. The lower edges of all of the walls 18, 19, 20 and 21 are turned inwardly to provide a ledge 22 which supports a bottom 24. Covering the entire top of body

3

10 and resting on top flange 15 of frame 14 is a rigid platform 25. Bosses 26 are attached to the underside of platform 25 to fit within the frame 14 in order to position properly the platform 25. The platform 25 is padded with a soft resilient material to provide a comfortable surface for receiving the patient.

Disposed on each side of body 10 are arm rests 28 which are mounted a short distance from one end of body 10 so as to be aligned with the arms of the patient, as seen in FIG. 1. The arm rests 28 are supported by a projection 29 attached, as by welding, to the frame 14, and are at such a height as to have the top surface of the arm rests substantially coplanar with the top of the padding on platform 25.

Referring to FIG. 4, the left end of body 10 has a sleeve 30 attached to the frame 14 and aligned with the longitudinal center line of body 10. The sleeve 30 is rectangular in cross section and receives a rectangular tube 31 through an appropriate aperture in the flange 16 of frame 14, and the tube 31 is locked in place by a screw 32 which threadedly engages a nut 34, nut 34 being fixed to sleeve 30. The screw 32 extends across the body 10 and projects through the flange 16 on the front of the device where the screw 32 is provided with a knob 35. Thus, the screw 32 may be tightened or loosened externally of body 10, and an adjustment made in the location of tube 31.

As best seen in FIG. 2, at the outer end of tube 31 is a T connection 38 fixed to the tube 31, T 38 slidably receiving a vertical tube 39. A T-handled set screw 40 engages a nut 41 to lock the tube 39 in place in the T connection 38. The upper end of tube 39 is provided with a cross bar 42 and on each end of cross bar 42 are upstanding ears 44 which support therebetween the head cradle 45 to be discussed in detail hereinafter.

Referring again to FIG. 4, the right hand end of body 10 is provided with an arrangement similar to that on the left end. A sleeve 50 is mounted on the frame 14, axially aligned with the sleeve 30. The inner end of sleeve 50 is braced by straps 51 which are attached to the end of sleeve 50 and angle over to legs 11. A nut 52 fixed to sleeve 50 threadedly receives a set screw 53, the set screw 53 extending across to the front of body 10 and projects through flange 16. A knob 54 is provided for ready adjustment of the screw 53. The sleeve 50 receives a tube 55; and, the tube 55 has fixed to the outer end thereof a T connection 56. The T 56 receives a vertical tube 58 and is provided with a T-handled set screw 59 engaging a nut 60 for adjustment of the vertical tube 58 within the tee 56. The uppermost end of the vertical tube 58 has a cross bar 61 affixed thereto, and cross bar 61 has two pairs of upstanding ears 62 and 64 to attach leg cradles to be discussed hereinafter.

The head cradle 45 (seen in FIGS. 1, 2, 3, 5 and 6) is made up of a pair of side plates 65 and 66 which are half-circles. Between the side plates 65, 66 is a throat piece 68 which is a circular arc in both longitudinal cross section and transverse cross section. The center portion 69 is constricted and the throat piece flares at both ends, curving up to the radius of the side plates 65, 66.

On each of side plates 65, 66 at the center of the circular arc are bosses 70 and 71 which receive a shaft 72. The shaft 72 extends the width of head cradle 45, and protrudes sufficiently past bosses 70 and 71 to be received by apertures in the ears 44. Screws 74 pass through shaft 72 and threadedly engage the bosses 70 and 71 to secure the head cradle 45 to the shaft 72. With this construction, it will be seen that the head cradle 45 can rotate about the shaft 72 in either direction until the side plates 65 and 66 contact the cross bar 42. In order that the head cradle 45 will provide tension automatically, a bias spring 75 is provided. The spring 75 surrounds one end of the shaft 72, as is seen in FIG. 6. One end of the spring 75 protrudes downwardly and bears against a plate 76 which is secured to the cross bar 42.

4

The other end of spring 75 is held by a boss 78 formed integrally with side plate 66, and having a bore 79 which receives the end of spring 75. The spring 75 is twisted so that the head cradle 45 will be urged in a counterclockwise direction, as viewed in FIG. 2; therefore, the head cradle tends to pull away from the body 10.

The entire throat piece 68 of head cradle 45 is covered with a soft padding material 80. This material not only makes the head cradle more comfortable, but also provides a much better grip on the head of the patient. The inside surface of the padding 80 should be very snug around the head of the patient, and of such characteristics as to conform to the head for a better grip. One material which has been found quite satisfactory for this purpose is a foamed polyurethane. This material is soft and yieldable, yet tough enough to withstand the tension and elastic enough not to pack, and become permanently distorted. The undesirable tactile quality of the foamed polyurethane may be improved by a cover cloth 81 shown in FIG. 1. This cover cloth 81 also allows the head cradle to be kept sanitary by changing the cloths 81 for different patients.

For both convenience and periodic relief of tension, a handle 82 is provided within easy reach of the patient. An arm 84 is secured to the side plate 66 and extends upwardly to handle 82, disposing the handle 82 to the left of the patient's head. With this handle, the tension may be adjusted or periodically relieved by rocking the head cradle toward the body 10.

In some instances when the tension exerted with only frictional hold is not sufficient, a positive-hold head strap 85 may be used. The head strap 85 is made up of a pad 86 to be disposed on the forehead of the patient; and, two straps 88 and 89 are attached to each side of the pad 85, and are adapted with grommets 90 to hook over lugs 91 and 92 on side plates 65 and 66 respectively. The straps 88 and 89 may be made of elastic material to add to the comfort of the patient and provide a tension to the forehead rather than a rigid holding force.

The leg cradles 95 and 96 are made up of two portions of cylinders joined at substantially right angles. Both leg cradles 95 and 96 are identical; therefore, only one will be discussed in detail. The horizontal portion 98 is approximately a half-cylinder, and is joined by a curved junction 99 to vertical portion 100. The portion 100 is less than a half cylinder, having the same transverse dimension as the portion 98, but having a larger radius. The cradle is thus formed so that the portion 98 will accommodate the smaller leg portion below the knee, and the portion 100 will accommodate the larger leg portion above the knee.

On each side of the leg cradles is a plate, such as plates 101 and 102 on cradle 95. The plates 101, 102 are substantially rectangular, and are welded to the two portions 98 and 100 of the leg cradle, substantially tangentially to the portion 98, thus providing parallel flanges for pivotal mounting of the cradle. The free corners of plates 101, 102 are provided with apertures to receive a rod 104, which runs the full length of cross bar 61, and is supported by ears 62 and 64. The two leg cradles 95 and 96 are fastened together by a bolt 105 threaded into each of the cradles and provided with lock nuts 106, thus causing the two leg cradles to rotate together and maintain the same relative position.

The entire inner surface of leg cradles 95, 96 is covered with padding as is the head cradle 45. A cover cloth 108 may be used on the leg cradles also.

The position that a person must assume in order to use the present device is somewhat difficult for a person to get into without assistance; therefore, a support 110 is provided on the back of body 10. The support 110 is held in a sleeve 111 attached to the back member of frame 14, and a T-handled set screw fixes the placement of the support 110. The upper end of the support 110 is curved to form a horizontal holding bar 112 so

that a person may readily grasp the bar 112 to assume the proper position.

In FIG. 4, a heat lamp 115 is shown. In some instances, it may be desirable to provide heat treatment of the back while the traction is used. In such an event, a heat lamp 115 is mounted on the bottom 24 of body 10. The platform 25 would be of metal to conduct the heat to the patient.

FIG. 9 shows a modified form of the present invention for use by patients who must stay in bed. The device of FIG. 9 includes left and right transverse members 120, 121 respectively, joined on one end by longitudinal member 122. Member 122 is a telescoping member having a larger section 124 into which a smaller section 125 may slide. A T-handled set screw 126 will maintain the position set. The transverse member 120 is provided with a pair of upstanding ears 44' which receive a head cradle as previously described. The transverse member 121 has a central standard 128 affixed thereto. A tube 58' is slidably received in standard 128, and is adjusted by means of T-handled set screw 129. A cross bar 61' is attached to the upper end of tube 58', and the cross bar 61' has two pairs of upstanding ears 62' and 64' to receive the leg cradles as previously described.

This form of the invention is used exactly as that form previously described, except that the patient's bed takes the place of the platform 25.

When using the device of the present invention, the patient lies down on the platform 25 with his torso approximately centered on the device. The set screw 32 is loosened by knob 35 to allow the tube 31 to be adjusted so that the head cradle 45 is under occipital areas of the cranium. The set screw 40 is then loosened, and the height of tube 39 is fixed to give a slight ventral curve to the cervical region of the spinal column when the patient's head is placed in the cradle 45. Next, the set screw 53 is loosened by knob 54 and the tube 55 adjusted to put the leg cradles 95 and 96 in the joint of the knee. The tube 58 is then adjusted to be high enough that the lumbar region of the spinal column will be slightly ventrally curved. The patient then lies back and pulls the handle 82 to rotate the head cradle in a clockwise direction as viewed in FIG. 1; he rests his head in the cradle, and allows the spring 75 to return the cradle 45 in a counterclockwise direction. The legs are in the leg cradles 95 and 96, and the muscles should be relaxed, allowing the weight of the feet and lower legs to rotate the leg cradles in a clockwise direction, as viewed in FIG. 1. Since the leg cradles 95 and 96 are fastened together, the pull on both legs will be equal; thereby preventing a lateral curvature of the spinal column, which may cause discomfort to the patient.

If more cervical traction is desired, the head strap 85 may be fastened across the forehead; if more lumbar traction is desired, a weight, such as a pillow P shown in broken lines in FIG. 1, may be placed on the feet of the patient.

For a better understanding of the operation of the device, attention is directed to FIG. 10 of the drawings. The line 150 represents the platform 25; the single line drawing at 151 represents the patient. The head 152 of the patient rests in the head cradle 45 and is urged in the direction shown by the arrow at 154. The cervical

region 155 of the spinal column is lifted slightly from the surface 150 and is pulled in the same direction as the head 152. The thoracic region 156 of the spinal column rests rather firmly on the surface 150.

The lower leg 153 tends to rotate about pivot 159 in the direction shown by arrow 160. This causes the knee 161 to be lifted, thereby exerting a longitudinal pull on the femur 162 to lift the pelvis and sacral region 163 off the surface 150, and to cause a ventrally directed curve to the lumbar region 164. With the entire pelvic area lifted from the surface 150, the pull on the femur 162 causes a pull on the lumbar region 164 in the direction of the arrow 166. This is true because the force on femur 162 may be broken down into two components: a vertical component, and a horizontal component, as shown by arrows 168 and 169 respectively.

With the forces thus arranged, very little of the patient's weight is on the surface 150. It would be possible to lift the patient entirely from the surface, though such a large amount of traction is rarely desirable.

It will therefore be seen that the present invention provides a device which is very effective, and quite easy to use. Due to the ventrally directed curvature of the torso, the entire tension is on the dorsal muscles, which prevents the undesirable effects caused by tension of stomach muscles. The device is very comfortable for the patient, and may be used for extended periods of time without injury to the patient. It has been found that the present device works as well for obese patients as for patients of less weight.

The embodiments of the present invention here chosen by way of illustration are meant to be in no way restrictive; therefore, numerous changes and modifications may be made, and the full use of equivalents resorted to without departing from the spirit or scope of the invention as outlined in the appended claims.

I claim:

1. An orthopedic traction apparatus comprising a platform on which a patient may be disposed in a supine position, a U-shaped head cradle at one end of said platform for supporting the head of said patient while said patient is in said supine position, means pivotally connecting said head cradle to said platform whereby said head cradle may pivot about a transverse axis, and means for yieldably pivoting said head cradle, said means for yieldably pivoting said head cradle including spring means acting between said head cradle and said platform for urging said head outwardly to apply a stretching action thereto in a direction away from the body of said patient

2. Method of applying tension to the backbone of a person, comprising the steps of disposing the body of said person in a supine position, raising the head of said person, pivoting said head rearwardly, raising the thighs of said person, holding the backs of the knees of said person while said thighs are raised and applying a downward force on said legs outwardly of said backs of said knees.

References Cited in the file of this patent

UNITED STATES PATENTS

933,170	Galbreath	Sept. 7, 1909
978,760	Langworthy	Dec. 13, 1910
1,390,301	McManis et al.	Sept. 13, 1921
1,539,214	Shockey	May 26, 1925