

[54] TRACTION DEVICE

[76] Inventor: **Donald Albrecht**, P.O. Box 1406,
831 Second St., Santa Monica,
Calif. 90406

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[52] U.S. Cl. **128/75, 128/84 C**

[51] Int. Cl. **A61h 1/02**

[58] Field of Search **128/75, 84, 71, 33**

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Primary Examiner—Richard A. Gaudet

Assistant Examiner—J. Yasko

Attorney, Agent, or Firm—Donald D. Mon

[57] ABSTRACT

An orthopedic traction device which consists of a frame having upstanding arms attached to a base

member portion, upon which a patient may recline. The upstanding arm framework has a transverse bar portion connecting two upstanding arms, and a lever arm member pivotally connected at an intermediate point of the transverse bar, the lever arm having calibrated graduations. A calibrated weight is slidably mounted on the graduated lever arm. There is a movable limit collar having a locking screw for position. A cable is connected to the end of the lever arm member. Tension force is transmitted to the patient from the lever arm through a cable and pulley system connected to a head harness. Tension force is transmitted to the spinal column and may be reacted by shoulder pads mounted on extensible arms pivotally mounted on the frame, if the traction is desired to be limited to the cervix. The head harness receives the load from the cable through a spring-like member which yields to allow the head harness to provide a gripping action over the whole cheeks of the face, thereby reducing high stress areas, such as on the chin. The device may be modified with reaction braces and harnesses to apply calibrated tensile load to other portions of the anatomy. In addition, a motor-driven device may be provided to alternately relieve and apply the load on the patient. A secondary vibratory force may be applied through the cable to give a high or low frequency of vibration to the portion of the anatomy under tensile traction load to further enhance the effect of the treatment.

23 Claims, 10 Drawing Figures

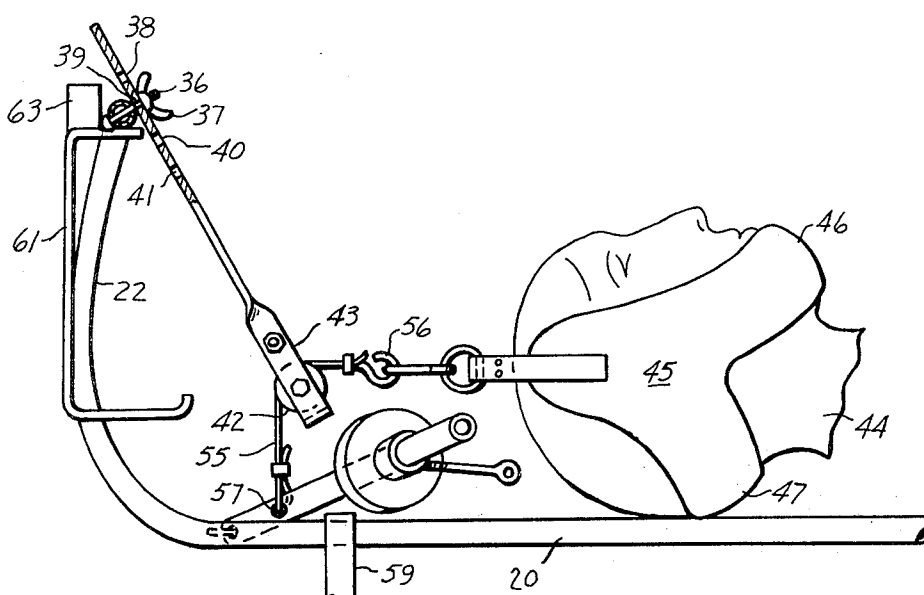


FIG. 1

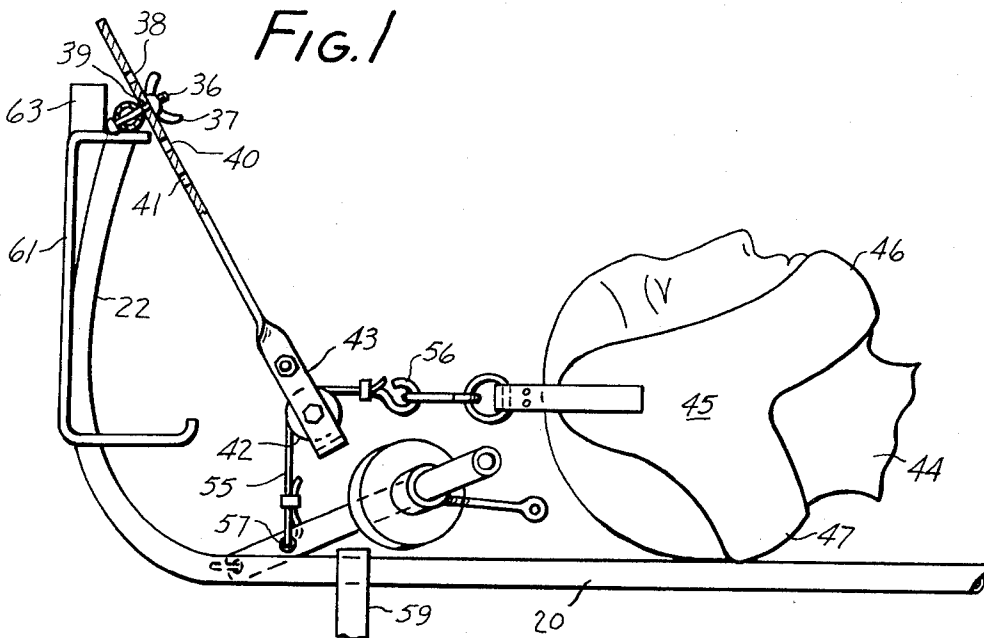


FIG. 2

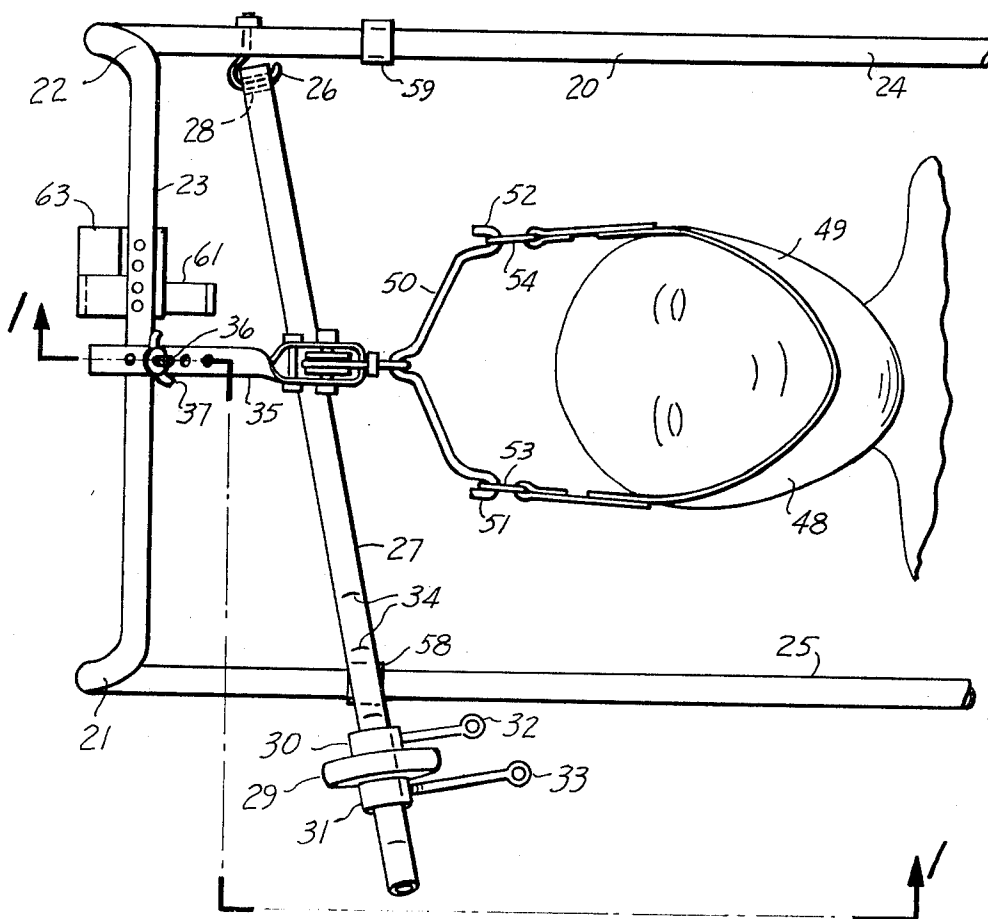


FIG. 3

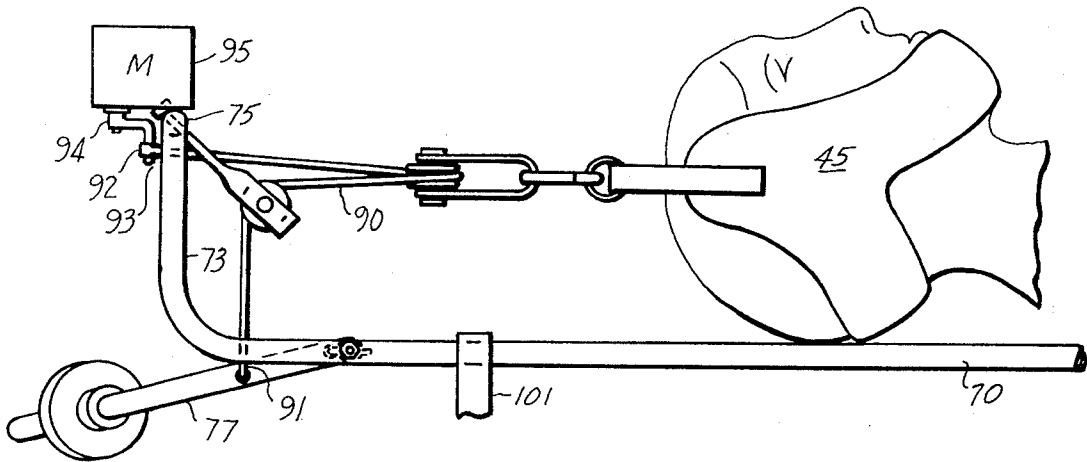


FIG. 4

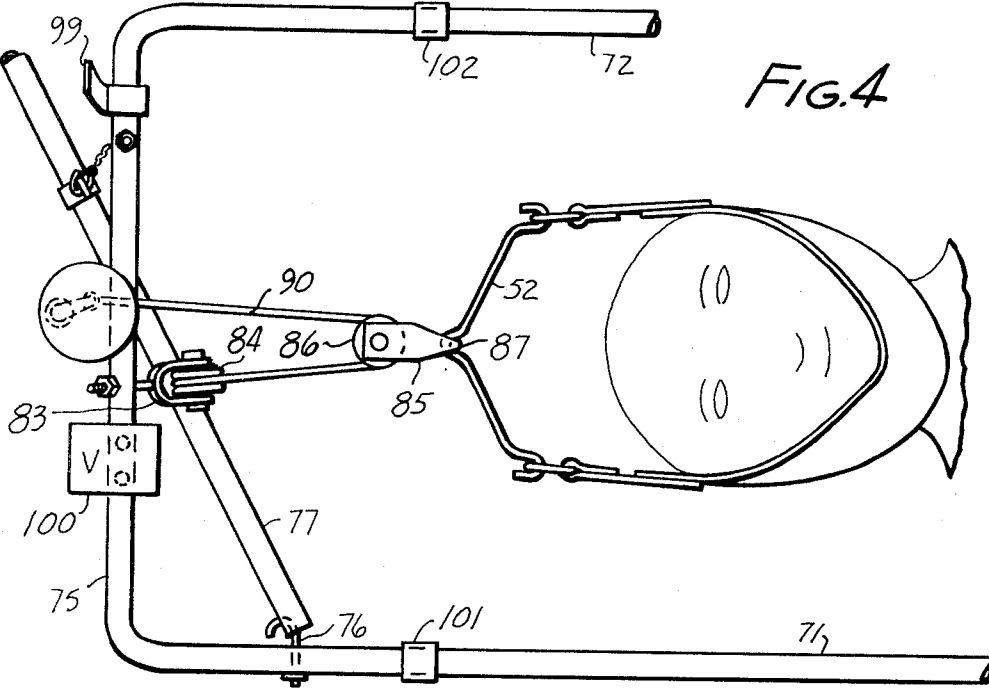


FIG. 5

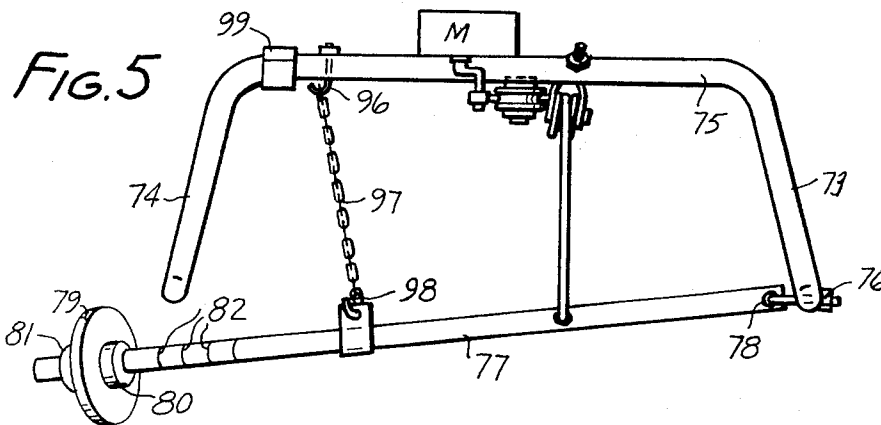


FIG. 6

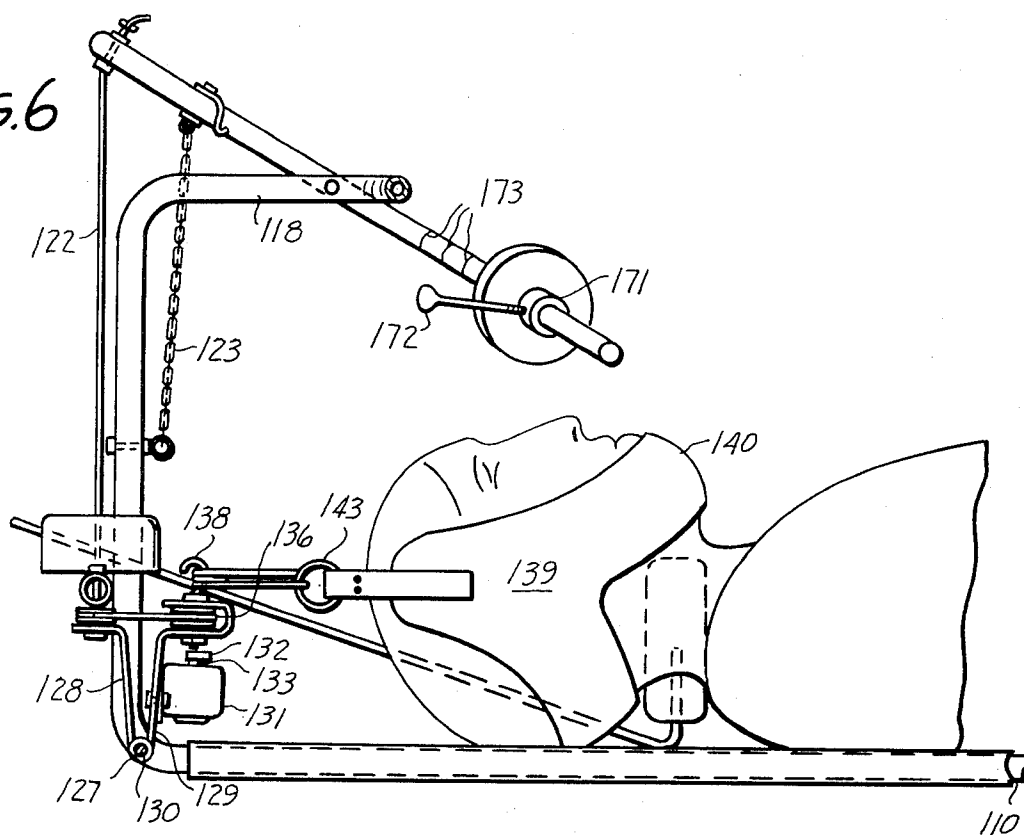


FIG. 7

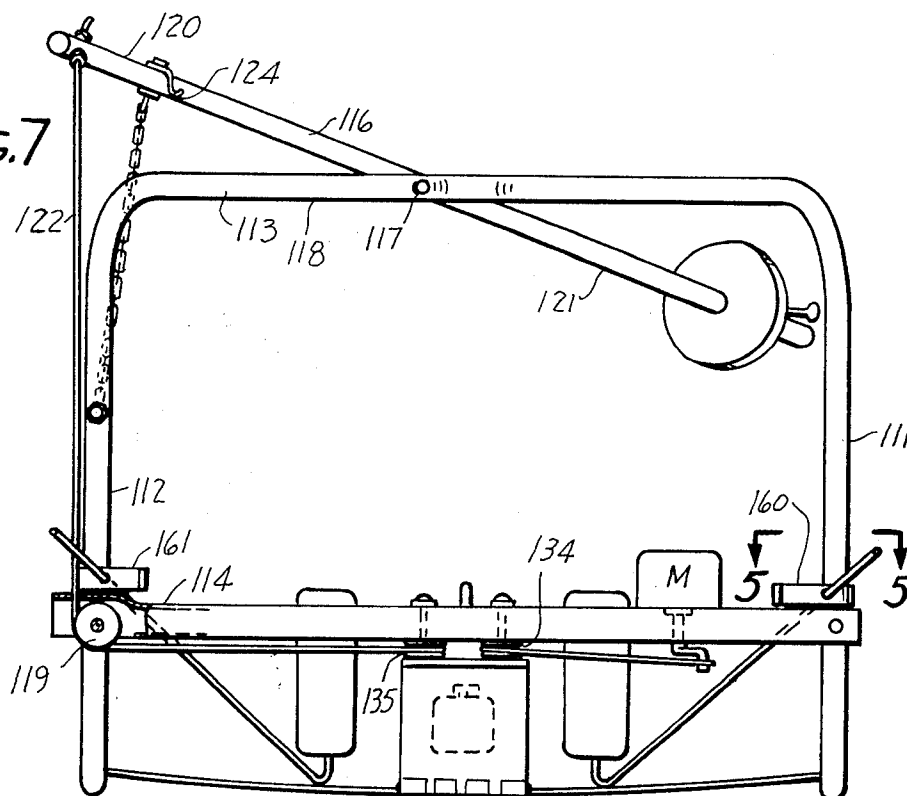


FIG. 8

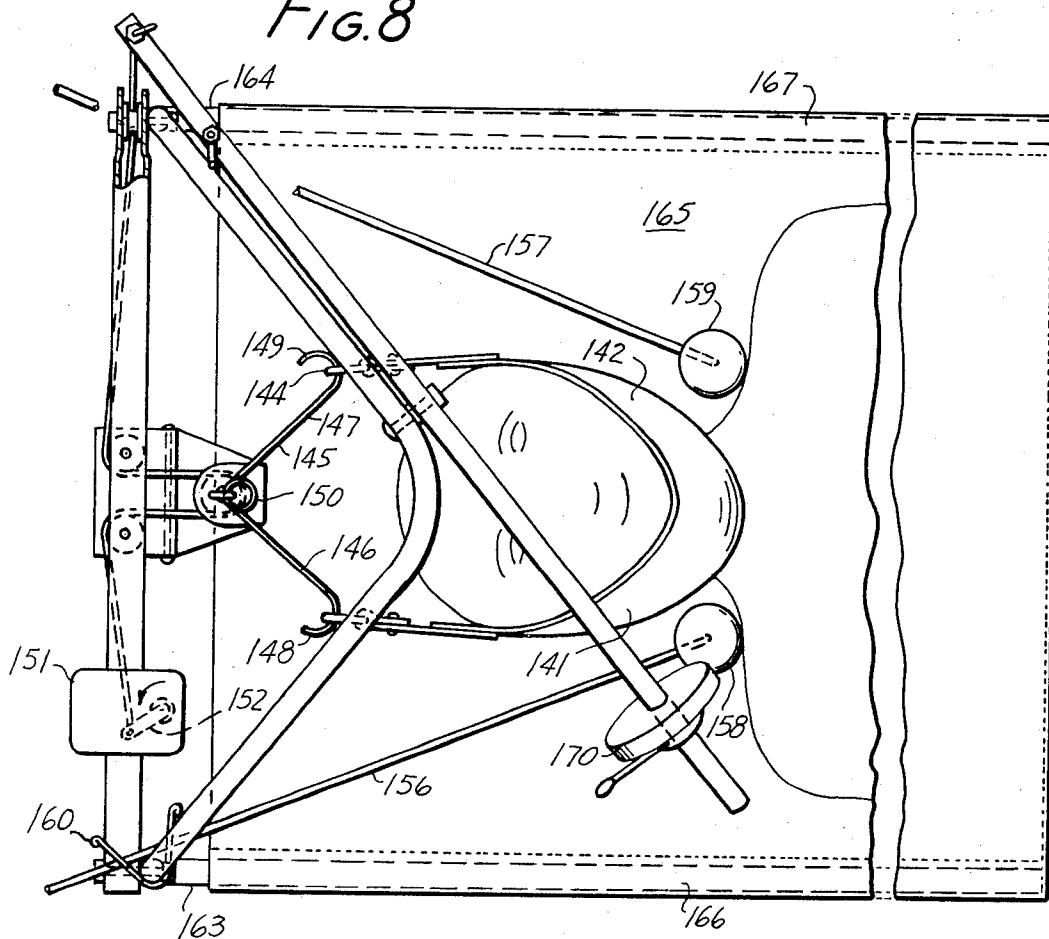


FIG. 9

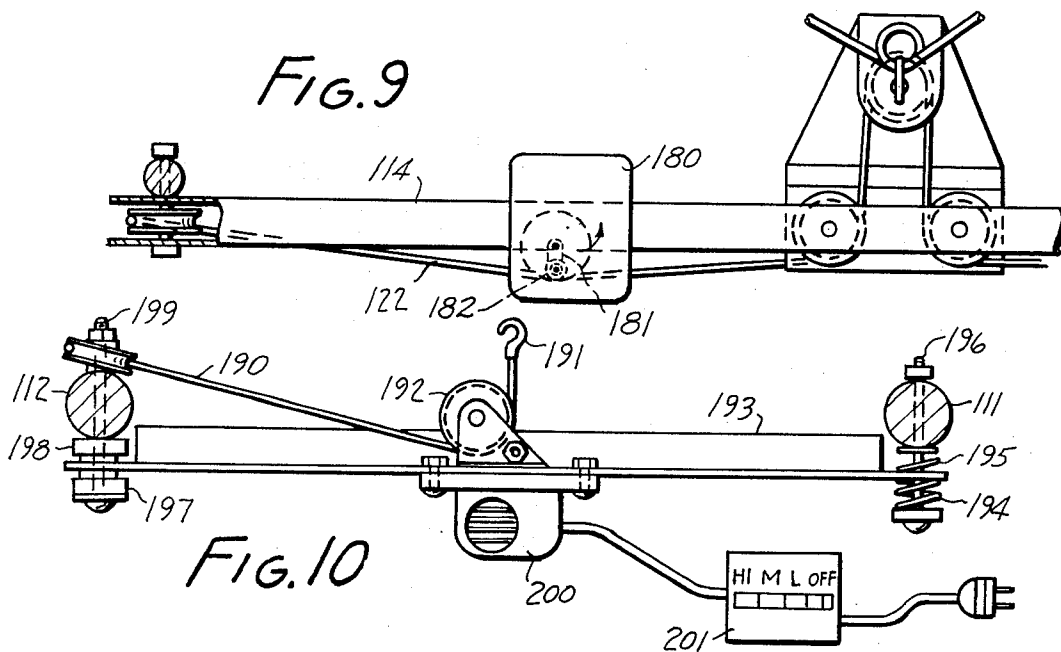
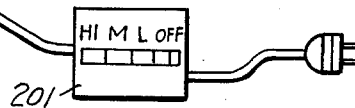


FIG. 10



TRACTION DEVICE

This invention relates to improvements in controlled tension traction devices as applied to orthopedic traction.

The object of this invention is to provide efficient and easily used devices which are portable and which will apply accurate loads for convenient treatment of patients in traction therapy.

A further object of the invention is to provide a lever-operated device with a calibrated sliding weight mounted on a graduated lever to predetermine load to be applied to the patient.

Yet another object is to provide a pre-set traction load which may be applied, removed or adjusted during application by an operator or the patient.

Another object of the invention is to provide for shoulder pads on extensible arms, pivotally mounted to the device, which are utilized to isolate the tension load applied to the cervix. Yet another object of the invention is to provide a variety of restraints for providing traction loads to any desired portion of the anatomy.

Still another object of the invention is to provide a spring-like spreader for the straps of a head harness so as to provide a gripping action to the face and head, thereby diminishing concentrated load on the chin.

A further object of the invention is to provide sliding weight means which may be easily moved by the patient, and/or an attendant, to relieve the traction load from the patient when the patient is being placed on the device for treatment or when the patient is removed after treatment. Another object is to provide sliding weight means which may be adjusted for traction load during treatment.

A further object of the invention is to provide motor-driven automatic cycling means for applying intermittent traction, or intermittently cycled pre-set higher and reduced traction, both of which are easily adjustable for force.

Still another object of the invention is to provide vibration means to the frame or directly to the traction transmitting cable to treat the patient with an in-line vibratory effect while under the traction load, vibration forces applied to the frame being transmitted through the cable.

Another object of the instant invention is to provide the foregoing advantages and treatments without the necessity of use of permanent installations utilizing hanging weights or sandbags on pulleys, forcing the patient to take treatment only in a hospital or other medical facility.

Previous devices that sought to apply this type of treatment to a patient consisted of pulleys and ropes or cables permanently mounted to beds, or to walls, or to roofs or doorways; and used suspended heavy bags of sand or other weighting material to generate the load for the patient. Combining these hanging weights conveniently and applying the load was cumbersome and required the patient to be present in a hospital or center of treatment at a specific time to be treated by trained personnel. The present invention can be used in any location, on any bed or couch, and the method of applying load is accessible to the patient so that the load may be placed in a rest position while the patient adjusts himself in proper position with the head harness, and then applies the load by reaching backward over his head to the lever arm.

These and other objects and advantages of the invention may be seen by a study of the drawings and the descriptions of the drawings which show the preferred embodiment of the invention.

FIG. 1 is a fragmentary side elevation of a preferred embodiment of the invention;

Fig. 2 is a fragmentary plan view of the embodiment of FIG. 1;

FIG. 3 is a fragmentary side view of another embodiment of the invention;

FIG. 4 is a fragmentary plan view of the embodiment of the invention of FIG. 3;

FIG. 5 is an end view of the embodiment of the invention of FIG. 4;

FIG. 6 is a fragmentary side view of another embodiment of the invention;

FIG. 7 is an end view of the embodiment of the invention shown in FIG. 6;

FIG. 8 is a plan view of the embodiment of the invention shown in FIG. 6;

FIG. 9 is a fragmentary top view of yet another embodiment of the invention; and

FIG. 10 is a fragmentary plan view of another embodiment of the invention.

DESCRIPTION OF THE INVENTION

FIG. 1 shows the preferred embodiment of the invention. A U frame 20, preferably of tubular construction, has upstanding arm members 21 and 22 and a top cross arm member 23. Horizontal base arm members 24 and 25 complete the frame 20. A hook mount member 26 is fixed to base arm member 24 so that it projects into the area enclosed by frame 20 in a horizontal plane. A lever arm member 27 is pivotally mounted to hook mount 26 by means of a loosely fitting mounting hole 28 engaging the hook mount member 26. A slidable weight 29 is mounted to lever arm member 27. Stop collars 30 and 31 are fitted with locking screws 32 and 33 on the lever arm member 27. Lever arm member 27 has calibrations 34 marked upon the surface. A bracket 35 is mounted to the cross arm member 23 of the frame 20 by means of a screw 36 and nut 37. The bracket 35 is adjustable in length with respect to the cross arm member 23 by means of holes 38, 39, 40, 41, which are adapted to engage the screw 36. A pulley 42 is mounted to the bracket 35 at the end 43 of the bracket 35, extending into the area encompassed by the frame 20. A patient 44 is equipped with a head harness 45 having a chin-retaining portion 46, head-retaining portion 47, and cheek-retaining portions 48 and 49. Attachment ring members 53 and 54 extend from cheek-retaining portions 48 and 49 of the harness 45. A spreader bar 50 has hook-like extremities 51 and 52 which are adapted to engage attachment ring members 53 and 54 on the harness 45. A cable 55 is equipped with a hook 56 at one end, and the other end of the cable 55 is fixedly attached to the lever arm member 27 at a midpoint 57. The hook 56 is adapted to engage the spreader bar 50. Spreader bar 50 is formed of a spring-like material which allows bending of the spreader bar to distribute imposed load on the head of the patient 44 over the cheek portions 48 and 49 of the head harness 45. Straps 58 and 59 are used to secure the frame 20 to a bed or other resting place for the patient 44 to recline upon. A support bracket 61 is attached to the cross arm member 23 of the frame 20.

The embodiment of FIGS. 1 and 2 would be used in the following manner. The frame 20 would be strapped to a couch, and the patient 44 would recline on the couch between the base arm members 24 and 25 of the frame 20. The head harness 45 would be placed on the patient, and spreader bar 50 would be engaged with the attachment rings 53 and 54 of the harness 45. Cable hook 56 engages the spreader bar 52. The extended length of bracket 35 is adjusted so that cable 55 exerts a horizontal pull upon the harness 45, transmitting the load thereby in line with the direction of the cervix of the patient. Using the calibrated locations 34 of the lever arm member 27, stop collars 30 and 31 are positioned to locate the slidable weight 29 at a suitable location to impose a desired load upon the cervix of the patient. Since the cable 55 is attached at a midpoint of the lever arm member, the mechanical advantage obtained through the use of the weight at the end of the lever arm member 27 will be the ratio of the length from the hook 26 to the position of the slidable weight 29 with respect to the length from the mounting hook 26 to the cable attachment point 57. These lengths are sometimes individually referred to as "lever arms," even though at least part of the length of each is included in the length of the other. The support bracket 61 is used to relieve the load on the patient by resting the lever arm member 27 upon the support bracket 61. The patient is placed in position with head harness 45 and spreader bar 52 engaged with the cable hook 56, then the lever arm member 27 is removed from the support bracket 61, either by the patient or by an attendant, and the load is applied to the patient.

A vibrator motor 63 may be mounted to the cross arm member 23 of the frame 20. If the vibrator is activated, low or high frequency vibration will transmit through the frame 20 to the bracket 35 and the cable 55 to provide vibration in line with the cervix of the patient.

FIGS. 3, 4 and 5 illustrate another embodiment of the invention, which is adapted to provide a varying load intensity applied to the patient, if desired. A frame 70 has two base arm members 71 and 72 and upstanding arm members 73 and 74 connected by a cross arm member 75. Head harness 45 and spreader bar means 52, as used in the embodiment of FIGS. 1 and 2, are again used, as hereinbefore described, in the instant embodiment. A lever mounting hook 76 is fixed to base arm member 71. A lever arm member 77 is pivotally mounted to mounting hook 76 by means of a loose fitting hole 78. Lever arm member 77 has a slidable weight 79 and adjustable collars 80 and 81 mounted for adjustment of position of the slidable weight 79 along the length of the lever arm member. Calibrations 82 indicate positions for the location of slidable weight 79 for imposition of a pre-selected load upon a patient. A pulley mounting bracket 83 is fixed to cross arm member 75 and has a pulley 84 rotatably mounted to the bracket 83 at the free end of the bracket 83. A clevis member 85 supports a pulley 86 which is rotatably mounted within the clevis. The clevis member 85 is closed at one end 87, and the closed end 87 engages the spreader bar 52 hereinbefore described. A cable 90 is threaded through the frame-suspended pulley 84 and the clevis-suspended pulley 86, and one cable end 91 is attached to the lever arm member 77 at an intermediate point, while the other end 92 of cable 90 is attached to a crank 93, which forms the end of a motor shaft 94

which protrudes from a motor 95 mounted on the cross arm member 75 of the frame 70, so that the axis of the motor shaft 94 is vertical with respect to the axis of the cross arm member 75. A hook 96 is mounted to cross arm member 75 and supports a chain 97, which chain 97 is attached by hook means 98 to the lever arm member 77 at an intermediate point. A bracket 99 is fixed to cross arm member 75, and the bracket 99 provides a rest upon which the lever arm member 77 may be placed. A vibrator 100 is mounted to the cross arm 75 of the frame 70. Retaining straps 101 and 102 are used to restrain the frame 70 in position on a bed or couch to provide for the patient to lie between the extended base arm member 71 and 72 and frame 70 for the application of cervical load.

Crank 93 is sometimes called an "intermittent load adjustment means," and serves to raise and lower (or relieve) the tension in the cable. The lowest tension can be total release, for example by resting of the lever on the support bracket, and the greatest level is that which is caused while pulling the cable to the maximum extent permitted by the cable and the throw of the crank. Also, the lower level could be a lesser one in which the weight is still supported, but which is less than the maximum as a consequence of the gradual release of the cable to lower the lever, followed, of course, by an increase in tension as the lever is lifted. This is an application of classical mechanics in the raising and lowering of a weight.

In operation, this device would be strapped to a table or a bed by means of straps 101 and 102. The patient would recline between the base arm members 71 and 72, adjusting the harness 45 in position and hooking the harness to the spreader bar 52 to engage the load system with the harness. The lever arm member 77 would be in a rest position on the bracket 99 with the safety chain 97 shortened by hooking an intermediate length over the hook 96. Releasing the intermediate length from hook 96 and lowering the lever arm member 77 from its rest position on bracket 99 allows the full load to come to bear upon the harness to the magnitude generated by the position of weight 79 on lever arm member 77. Activating the motor 95 causes crank 93 to rotate, lengthening the cable 90 so that the lever arm 77 drops to the full length of chain 97, so it is supported by the chain, thus relieving the load, upon the patient in traction when the crank is pointing toward the patient. As the crank 93 revolves, shortening the cable, load is again imposed on the patient by the lever arm member as soon as the lever member is lifted by the end of the cable attached to it at 91, thus re-imposing the cervical traction on the patient and giving the patient a varying load application from a minimum load of zero to a maximum load imposed by the location of the slidable weight 79 on the lever arm member 77. In accordance with classical mechanics, the load will be decreased while the crank moves toward the patient, and will be increased as it moves away from him so long as the load is supported by the cable. This is a consequence of the lowering and raising of the weight. A vibrator 100, when actuated, will transfer low or high frequency vibration through the cable 90 to the cervical traction load on the patient.

FIG. 6 shows another embodiment of the invention. A basic frame 110 has upstanding arm members 111 and 112 and a top cross arm member 113. The top cross arm member 113 is bent to an angle, as can be

seen in FIG. 8. A horizontal brace bar 114 is fixed at each end to the upstanding arm members 111 and 112. A lever arm member 116 is pivotally mounted by means of pin 117 to the top cross arm member 113, and is parallel to the angled side 118 of the top cross arm member 113. A pulley 119 is rotatably mounted to the end of horizontal brace bar 114 adjacent upstanding member 112. The lever member 116 is pivoted on pin 117 at an intermediate point to produce two lever arms 120 and 121. At the end of the lever arm 120 a cable 122 is attached. One end of a chain 123 is fixed to lever arm 120, and chain 123 has its other end fixed to upstanding frame arm 112. A hook 124 is fixed to lever arm 120.

A hinged base 127 has one base plate member 128 fixed to the brace bar 114, and the free base plate 129 is free to swivel about the hinge pin 130. Fixed to the free base plate 129 is an electric motor 131. The motor 131 has an eccentric weight 132 fixed to the motor shaft 133.

A compound pulley system, which consists of a first pulley 134, a second pulley 135 mounted to the fixed base plate 128, and a third pulley 136 mounted to the free base plate 129, is engaged by the cable 122 to produce a 2:1 ratio of mechanical advantage for force applied to the cable by lever arm member 116. A hook 138 is fixed to free base plate 129.

A fabric head harness 139 has a formed chin-retaining portion 140 formed to fit the configuration of a patient's head. The harness 139 has two cheek portions 141 and 142 which are contiguous with the chin-retaining portion, and serve to extend the harness up along the cheeks to a region above the head. By means of attachment rings 143 and 144, the harness is attached to spring member 145. The spring member 145, as can be seen in FIG. 8, has two elongated arms 146 and 147. At the end of each of the two elongated arms 146 and 147, there are formed retaining hooks 148 and 149. The center section of the spring member 145 is formed into a coil spring 150 having one or more turns. The hook 138 on the free base plate 129 is adapted to engage the coil spring 150.

An electric motor 151 is mounted to the crossbar 114. The shaft of motor 151 is formed in the shape of a crankshaft 152. Cable 22 is fixed to the free end of crankshaft 152 after being engaged around pulleys 134, 135 and 136, as can be seen in FIG. 8.

A pair of arms 156 and 157 are swivelly and adjustably mounted to the upstanding arms 111 and 112 of the frame 110. Pad rolls 158 and 159 are fixed vertically to arms 156 and 157. Spring clamps 160 and 161 adjustably secure the arms 156 and 157 to the frame 110. Squeezing the free ends of the spring clamps 160 and 161 allows arms 156 and 157 to be extended or retracted, as well as swivelly rotated, for proper positioning of pad rolls 158 and 159 on the patient. The pad rolls 158 and 159 provide all angle protection to the patient, regardless of the angle of application.

The frame 110 has two horizontally extending base arm members 163 and 164. A fabric cover 165 has sewn tubular hems 166 and 167 which fit over base arm members 163 and 164 to form a surface on which a patient may lie.

As hereinbefore described, cable 122 is fixed to lever arm member 116 at the free end of lever arm 120. The cable 122 is then passed around pulley 119 and through the compound pulley system around pulleys 134, 135

and 136, and the free end of cable 122 is fixed to the crank 152 ("intermittent load adjustment means") of motor 151. Swivel hook means 138 is engaged to coil spring 150 of the spring member 145. The formed hooks 148 and 149 of spring member 145 engage the attachment rings 143 and 144 of the head harness 139.

A slidable weight 170 is held in position on lever arm member 116 by collar 171 and thumb screw 172. Calibrations 173 are used to mark appropriate positions for slidable weight 170.

The force applied to the fabric head harness 139 is proportional to the distance of the sliding weight 170 from the fulcrum point 117, with the multiplying factor of the compound pulley system 134 acting to increase the applied force.

The load to be applied to the patient is set by adjusting slidable collar 171 to one of the calibrations 173 on the lever arm member 116. The slidable collar 171 is held in place by thumb screw 172. The slidable weight 170 is then placed against the collar 171, and the load may be verified with a conventional spring-type weighing scale at hook 138. The load to be applied would be one that is prescribed by a physician. The slidable weight 170 is then moved to a rest position towards the pivot point 117 of the lever arm member 116. The patient reclines upon the fabric cover 165 and places the harness 139 about his head.

Spring member 145 is attached by hook-like extremities 148 and 149 to the harness 139, and hook means 138 of the cable 122 are connected to spring member 145. Sliding the slidable weight 170 against the stop collar 171 then applies the load against the head and cheeks of the patient. The arms 156 and 157 are swivelled so that pad blocks 158 and 159 react the pull of the head harness 139 against the shoulders of the patient through the cervix.

If it is required that the load on the patient be alternately applied and withdrawn, then the electric motor means 151 is actuated to rotate crank 152, alternately applying and relieving the load on the patient by pulling cable 122 enough to accept the load of lever arm member 116, then letting safety chain 123 hold the load as the crank 152 rotates to relieve the load on the patient cyclically. The term "support means" is used generically to describe the support bracket, or the safety chain, the function of the support means being to support the weighted lever arm member and relieve the cable means of force.

It is to be understood that this device may be used to apply load to any portion of the body, such as a foot or leg, which requires traction for the setting of a broken bone, or similar trauma. The load can be applied to any portion of the body that can be positioned to receive and react an applied tensile force. In utilizing this device for those applications, modifications would be made to the harness for gripping the portion of the body to be placed under load. Reaction means can be attached to the frame of the device for positioning and reacting the force on the body member under load.

When a higher frequency of vibration, or varied applied load, is desirable, another convenient way of providing such treatment using the embodiment of FIG. 6 may be seen in FIG. 9. Fixed to the horizontal bar 114 is an electric motor 180 having a crank shaft 181. The crank shaft 181 ("intermittent load adjustment means") has a roller 182 attached to the free crank

end. The roller 182 engages cable 122 to cyclically apply and remove the load.

Another embodiment of the invention may be seen in FIG. 10 wherein a cable 190, which is adapted to transfer an applied load to a patient through a hook 191, is passed around a pulley 192. The pulley 192 is mounted to a crossbar 193. The crossbar 193 is resiliently mounted to the upstanding arms 111 and 112 of frame 110, as hereinbefore described for the embodiment of FIG. 7, by use of spring members 194 and 195 assembled about mounting bolt assembly 196 and rubber grommets 197 and 198 assembled about mounting bolt assembly 199. A vibrator motor 200 is fixed to crossbar 193. Vibrator motor 200 preferably has selectable ranges of cyclical vibration through switch 201. Actuating vibrator motor 200 transmits cyclical vibration to cable 190 for application of such vibration during the application of cervical load to the patient.

Therefore, this invention, in all of its embodiments, provides direct, measurable mechanical means to apply tensile load to a portion of the anatomy of a patient for medical purposes. The load may be varied cyclically between a high limit and a low limit, with the low limit variable down to zero. In addition, vibration may be applied simultaneously with the load and in the same direction and location as the applied load to obtain further medical benefits.

The term "intermittent load adjustment means" as used in connection with cranks 92, 152 and 181 is intended to connote a gradual raising and lowering (or relieving) of the tension in the cable. This is contrasted with the oscillating effect of the vibrators when used, which vary the tension cyclically above and below a relatively stable level (i.e., continuous and unvarying, or relatively slowly changing as a consequence of the operation of the intermittent load adjustment means).

This invention is not to be limited by the embodiments shown in the drawings and described in the description, which are given by way of example and not of limitation, but only in accordance with the scope of the appended claims.

I claim:

1. A physical traction apparatus for applying linear force through harness means to a portion of an anatomy which comprises:

- a. a frame;
- b. a lever arm member, said lever arm member pivotally mounted on said frame;
- c. pulley means, said pulley means rotationally mounted to said frame;
- d. cable means, said cable means engaged with said pulley means, one end of said cable means fixed to said lever arm member; and
- e. weight means, said weight means adjustably mounted on said lever arm member, said cable means adapted to transmit force generated by said lever arm member and said weight means to said harness means.

2. Apparatus according to claim 1 which includes said frame having a plurality of interconnected upstanding arm members and base arm members, said lever arm member being pivotally mounted to one of said upstanding arm members, said upstanding arm members connected by at least one cross arm member.

3. Apparatus according to claim 1 which includes said lever arm member having one free end and one end pivotally mounted to said frame, and said end of

said cable means fixed to an intermediate point along the length of said lever arm member, and said weight means adjustably mounted to said lever arm member for placement at selected locations along the lever arm member.

4. Apparatus according to claim 3 which includes said frame having a plurality of interconnected upstanding arm members and base arm members, said lever arm member pivotally mounted to one of said upstanding arm members, said upstanding arm members connected by at least one cross arm member.

5. Apparatus according to claim 4 which includes vibrator means, said vibrator means mounted to said cross arm member, and said pulley means mounted to said cross arm member, said vibrator means adapted to transmit vibration through said cable means to said harness means.

6. Apparatus according to claim 1 which includes said pulley means having a multiple pulley means engaged with said cable means in a compound pulley system means adapted for multiplying said force generated by said lever arm member and said weight means.

7. Apparatus according to claim 6 which includes said compound pulley means having at least one pulley mounted on hinged base means, said hinged base means mounted on said frame, and a vibrator means mounted on said hinged base, said vibrator means adapted to vibrate said cable means through said pulley means.

8. Apparatus according to claim 1 which includes said frame having upstanding arm members and horizontal base arm members, said upstanding arm members connected by at least one cross arm member, said lever arm member pivotally mounted to an intermediate point on said cross arm member at an intermediate point on said lever arm member, said cable means fixed to one end of said lever arm member, said weight means adjustably mounted to the lever arm member for placement at selected places along its length between said intermediate point on said lever arm member and the end of said lever arm member opposite said cable means.

9. Apparatus according to claim 1 in which said lever means is calibrated to indicate the tension derived from placement of the weight means at that place along the lever arm member.

10. Apparatus according to claim 1 in which intermittent load adjustment means is interconnected between the frame and the cable, whereby to impose a variable load on the anatomy under therapy.

11. Apparatus according to claim 10 in which the intermittent load adjustment means comprises a rotary crank connected to the cable whereby to pull and relieve the same.

12. A physical traction apparatus according to claim 1 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

13. A physical traction apparatus according to claim 2 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

14. A physical traction apparatus according to claim 3 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

15. A physical traction apparatus according to claim 5 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

16. A physical traction apparatus according to claim 8 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

17. A physical traction apparatus according to claim 10 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

18. A physical traction apparatus according to claim 1 in which vibrator means is attached to the frame to transmit vibratory forces to the cable means through the frame.

19. A physical traction apparatus according to claim 10 in which vibrator means is attached to the frame to transmit vibratory forces to the cable means through the frame.

20. A physical traction apparatus according to claim 19 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same,

thereby relieving the cable means of force.

21. A physical traction mechanism for applying linear tensile force through harness means to a portion of a body for medical therapy which comprises:

- a. a frame, said frame having upstanding arm members, said frame having horizontally extending base arm members attached to respective upstanding arm members, said frame having a cross arm member connecting said upstanding arm members;
- b. a lever arm member, said lever arm member pivotally mounted to one of said horizontally extending arm members adjacent to one end of said lever arm member, said lever arm member adapted to extend within an area encompassed by said frame;
- c. a weight member, said weight member adjustably mounted on said lever arm member for placement at selected locations along the lever arm member;
- d. pulley means, said pulley means mounted to said frame;
- e. cable means, said cable means fixed to the lever arm member at an intermediate point on said lever arm member, said cable means adapted to engage said pulley means, said cable means adapted to transmit force from said lever arm member to said harness means.

22. A physical traction apparatus according to claim 21 in which a support means is attached to the frame at a location distant from the place where the lever arm member is mounted to the frame, and in the path of the lever arm member, whereby to support the same, thereby relieving the cable means of force.

23. A physical traction apparatus according to claim 21 in which vibrator means is attached to the frame to transmit vibratory forces to the cable means through the frame.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,868,951
DATED : March 4, 1975
INVENTOR(S) : DONALD ALBRECHT

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

[57] Abstract, line 6, "connected" should read --mounted--
Col. 1, line 21, "provice" should read --provide--
Col. 2, line 29, "U frame" should read --"U" type frame--

Col. 4, line 10, "arm 75" should read -- arm member 75 --

Col. 4, line 17, "means," should read --means",--
Col. 4, line 47, cancel comma, second occurrence
Col. 4, line 50, "lever member" should read --lever arm member--

Col. 5, line 8, "member 112" should read --arm member 112--
Col. 5, line 8, "lever member 116" should read --lever arm member 116--

Col. 10, line 14, "aaid" should read --said--
(Cl. 21)

Signed and Sealed this

second Day of December 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks