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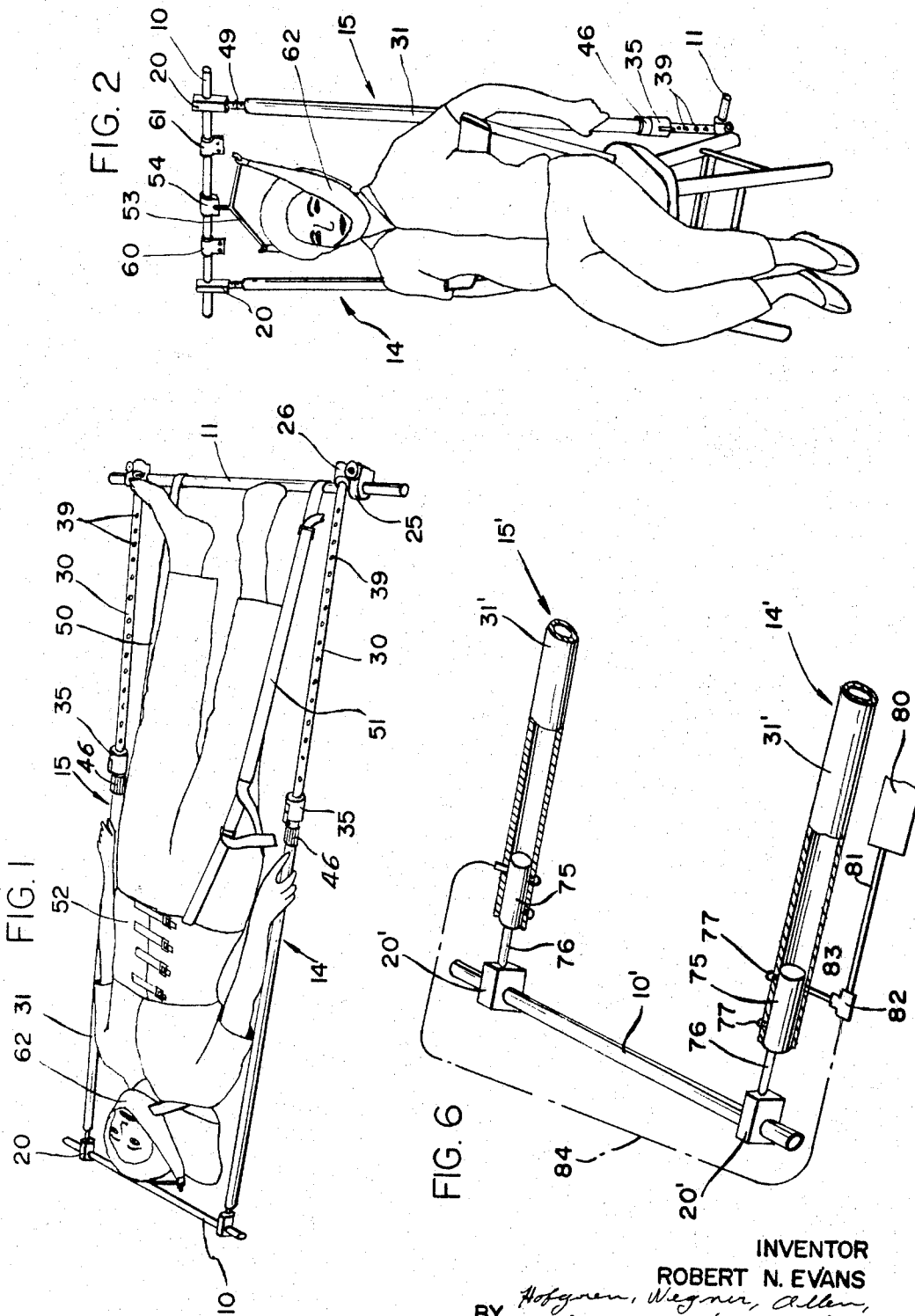
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BODY TRACTION DEVICE

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2 Sheets-Sheet 1



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3,413,971

BODY TRACTION DEVICE
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This invention relates to body traction devices and, more particularly, to a portable, lightweight traction device equally suitable for use in a hospital, a doctor's office or a patient's home.

An object of this invention is to provide a lightweight, portable traction device which can be adjusted to adapt to the size of a patient and the type of traction to be applied and wherein a person may apply, to himself, the desired degree of traction, while in the device.

Still another object of the invention is to provide a traction device, as defined in the preceding paragraph, having a frame with top and bottom cross bars at the ends thereof with a pair of spaced side bars extended between the cross bars and connected thereto, with each of the side bars having means providing for coarse adjustment to adapt the traction device to the desired over-all length and further having means facilitating the application of a desired amount of traction after the patient is harnessed in the traction device.

A further object of the invention is to provide a traction device as defined in the preceding paragraphs wherein each of the side bars are formed of inner and outer telescoping members with the inner member having spaced openings for coaxing with a collar mounted thereon having a latch, with the latch engageable in one of the openings on the inner member and the collar abutting the outer telescoping member to limit the movement of the members inwardly relative to each other, whereby the position of the latch in one of said openings determines the over-all length of the traction device, and with the outer member either having a threaded connection to one of the cross bars and rotatable with the desired amount of traction being applied by rotation of the outer side bar members or fluid-operated means to apply the desired amount of traction.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of a preferred embodiment of the traction device shown in use with a patient using traction appliances, including a pelvic belt and a cervical collar;

FIG. 2 is a perspective view of the traction device shown as used by a patient in neck traction, while sitting in a chair;

FIG. 3 is a plan view of a part of the traction device, showing one side bar broken away and connected to cross bars at opposite ends of the traction device which are broken away;

FIG. 4 is an elevational view of the structure seen in plan in FIG. 3 and with parts broken away and parts in section to better illustrate the construction;

FIG. 5 is a vertical section, taken generally along the line 5—5 in FIG. 4; and

FIG. 6 is a perspective fragmentary view of a modification of the structure for applying the desired amount of traction, and with parts broken away.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the invention together with a modification thereof with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated. The scope of the invention will be pointed out in the appended claims.

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The traction device of my invention is shown in two of many different uses in FIGS. 1 and 2. In FIG. 1, a patient is shown in the traction device having traction applied from the pelvic area up to the cervical area, with the patient in a reclining position; while in FIG. 2, the patient is shown sitting upright in a chair and with cervical traction being applied, with the traction device in a generally upright position. These various uses are permitted by the portable, lightweight, simply adjustable construction of the traction device which embodies an upper cross bar 10 and a lower cross bar 11 defining ends of the traction device which are connected by side bars, indicated generally at 14 and 15. Although the cross bars 10 and 11 are shown as formed of round stock, it will be apparent that other shapes, such as square stock, could be used.

The side bars 14 and 15 can be spaced at different distances from each other, dependent upon the size of the patient using the traction device, with the adjustments being along the cross bars 10 and 11. The adjustment along the cross bar 10 is obtained by movement of a clamp block 20 associated one with each of the side bars and shown particularly for side bar 15 in FIGS. 3 and 4. This block, when loose, can be moved along the cross bar 10 and when in a desired position can be clamped to the cross bar by tightening of a machine screw 21. The adjustment of the side bars at the cross bar 11 is obtained by a releasable double C-clamp associated one with each side bar and having a C-clamp 25 engaging the cross bar 11 and a second C-clamp 26 engageable with a part of the side bar. Backing off of a bolt 27 loosens the clamp 25 so as to permit adjustment of each of the side bars on the cross bar 11.

Each of the side bars 14 and 15 are constructed for a plurality of adjustments in addition to the width adjustment described above, with a coarse adjustment providing for establishing an over-all effective length for the traction device, as will be noted by comparing the different lengths in FIGS. 1 and 2, and secondly with means for providing a fine adjustment so that a patient can apply the desired amount of traction. Assuming that a patient is to use the traction device in a reclining position, the length of the traction device will be adjusted to a length slightly greater than the height of the person. This is accomplished by the side bar construction embodying an inner, tubular telescoping member 30 fitting within an outer member 31 with detent means for limiting the movement of member 30 into the member 31. This detent means embodies a collar 35, loose on the inner member 30 and having a latch arm with latch member 36 pivotally mounted on a pin 37 mounted on the collar and urged by a spring 38 into engagement with a selected one of a series of spaced-apart openings 39 formed in the inner member 30 of the traction device. It will be apparent from the drawings that the construction of each of the side bars 14 and 15 is the same, so that the description in detail of side bar 15 will be sufficient for both of the side bars. The openings 39 can be suitably spaced apart, such as one inch apart, whereby with suitable indicia associated therewith a patient can readily set the traction device to the desired over-all length. The inner member 30 is guided for movement within the outer member 31 of the side bar by a series of buttons of suitable bearing material 40, such as nylon, whereby the inner member is free for movement when the latch 36 is released.

The collar 35 abuts an annular bearing washer 45, loose on inner member 30 and formed of suitable material, such as nylon, which engages an end of the outer member 31, as shown in FIGS. 3 and 4, whereby the outer member is free to rotate relative to the inner member, as further facilitated by the buttons 40 disposed within the interior of the outer member 31. Rotation of the outer

member is facilitated by a knurled sleeve 46 fastened to the end of the outer member 31 adjacent the washer 45.

Rotation of the outer member 31 of the side bar is used in the preferred embodiment to obtain the small amounts of adjustment for applying traction to the patient. This is accomplished by having a plug 48 fitted in an end of the outer member 31 and provided with a threaded opening into which a threaded member 49 is threaded and which fixedly extends from the clamp block 20 fastened to the cross bar 10.

The operation and use of the device is believed clear. When using the traction device in the manner shown in FIG. 1, the over-all length of the traction device is first set to be slightly longer than the height of the patient by extending the inner members 30 from the outer members 31 of the side bars a desired distance and then positioning the latch collars 35 adjacent the ends of the outer members 31 and engaging the latches 36 in the opening 39 found at this position. The pelvic appliance can then be fastened to the lower cross bar 11 by straps 50 and 51, with the girdle section 52 fastened to the patient. The cervical collar 62 is placed about the chin of the patient, and then fastened by a bracket 53 to a clip 54 laterally adjustable along the length of the top cross bar 10. With the patient then lying in the position shown in FIG. 1, the outer members 31 of the side bars can be rotated to adjust the threaded connections between plugs 48 and threaded members 49 to apply the desired degree of traction, with the reaction to this force being taken up by the abutment of the opposite end of outer members 31 against the washers 45 engaging the latch collars 35.

Of course, other forms of traction can be used by use of different traction halters or appliances, such as chest binders and ankle cuffs, with ankle cuffs being attachable to a pair of clips 60 and 61 laterally adjustable on the cross bar 10. When only one traction appliance is used, the person's weight can function as a counter-pull when the traction device is used in a horizontal position.

As an example, if the use of the traction device is to be changed from that shown in FIG. 1 to that shown in FIG. 2, then the particular harness used in FIG. 1 is removed from the frame of the traction device and the latches 36 released to move the inner side bar members 30 to positions substantially within the outer members 31 and the latches 36 again then re-set in the suitable openings 39 and then the unit is placed upright with the cervical collar 62 engaged with the bracket 53 supported by the cross bar 10.

An alternate construction for applying the desired amount of traction is shown in FIG. 6 in which the threaded members 49 have been replaced by fluid-operated means for varying the position of the cross bar 10 relative to the side bars. In this embodiment, the same parts as those described in the embodiment of FIGS. 1 to 5 have been given the same reference numerals, with a prime affixed thereto.

In this embodiment, instead of the ends of the outer members of the side bars having plugs therein, a single-acting fluid cylinder 75 is positioned in the end of each cross bar and has a piston therein connected to a piston rod 76 which is fastened to the clamp blocks 20'. Each of the cylinders is held in the end of the tube against movement by a pair of screws 77. A source of fluid 80 is connected by a line 81 to a control valve 82 having an outlet 83 connected to one of the cylinders 75 and a line 84 connected to the other cylinder. When the valve 82 is in one position, fluid is supplied to the rear ends of the cylinders to advance the pistons and piston rods 76 and when the valve is shifted to another position, the rear of the cylinders is permitted to bleed and springs within the single-acting cylinders 75 return the pistons and piston rods 76. The source 80 can be a tank of compressed air or when the device is used in an institution an air compressor would probably be available. Alternatively, hydraulic fluid could be used in place of air. With the construction shown in

FIG. 6, it is possible for a crippled or arthritic patient to use the traction device and apply the desired amount of traction, without having to impart rotation to the side bars.

As will be seen from the foregoing description, the traction device disclosed herein is of a lightweight construction, since the parts can be formed of a lightweight metal, such as aluminum, and can easily be knocked-down for transport and, when in use, can be adjusted both to the width as well as the height of the patient and the patient, himself, can apply the desired amount of traction, either by rotating parts of the frame of the traction device or, in the alternate embodiment, by opening a valve to supply fluid to means associated with the frame for applying the traction.

The angle cuffs referred to previously herein can have a connecting fastener or knob at the back of the heel to permit walking with the ankle cuff on and permit easy attachment and release to the traction device by inserting and removal in a keyhole slot provided in clips 60 and 61, shown in FIG. 2.

I claim:

1. A traction device comprising, a frame having top and bottom cross bars, a pair of spaced side bars extended between the cross bars and connected thereto, each of the side bars having means for varying the effective length thereof in spaced increments to vary the distance between the cross bars and set the over-all length of the traction device, and means associated with each of the side bars for varying the effective length thereof in small amounts to apply the desired amount of traction.

2. A traction device as defined in claim 1 wherein each of said side bars is formed of a pair of telescoping members with the inner member having openings spaced along the length thereof and said means for varying the effective length in spaced increments comprises a latch engageable in one of said openings for holding said members in adjusted position.

3. A traction device as claimed in claim 2 wherein said means for varying the effective length in small amounts comprises a threaded connection between the side bars and one of said cross bars.

4. A traction device as defined in claim 3 and having adjustable means on one of said cross bars to which a traction appliance may be releasably attached.

5. A traction device as defined in claim 2 wherein said means for varying the effective length in small amounts comprises a pair of fluid cylinders connected between a side bar and a cross bar.

6. A traction device as defined in claim 1 and having means adjustably connecting each side bar to a cross bar whereby the spacing between the side bars can be varied.

7. A traction device for applying traction to a patient comprising, a pair of spaced-apart cross bars at the ends of the traction device interconnected by a pair of spaced side bars whereby a patient may be positioned between said side bars, each of said side bars formed of two telescoping members, interengaging slot and detent means on each side bar for setting the over-all length of the traction device by controlling the extent to which one member protrudes from the other, means adjustably connecting one of said side bar members to the cross bar for obtaining fine adjustment of said traction device, and means mounting the side bars on the cross bars for adjustment to adapt to the size of a patient.

8. A traction device as defined in claim 7 wherein said interengaging slot and detent means is defined by a series of equally spaced openings on the inner of said telescoping side bar members, and a collar movable on said inner side bar member and carrying a latch for engagement in one of said openings, said collar being of a size to abut against the outer of said side bar members to limit the inward telescoping movement of said side bar members.

9. A traction device as defined in claim 8 wherein a bearing washer is interposed between said collar and the

outer side bar member to permit free rotation therebetween, and said adjustable connecting means includes a plug fitted in an end of the outer side bar member and having a threaded opening, and a threaded member carried by the cross bar and threaded into said plug whereby a patient can set the over-all length of the traction device and then when in the desired traction appliance can rotate the outer side bar members to apply the desired amount of traction.

10. A traction device as defined in claim 8 wherein said adjustable connecting means comprises a fluid cylinder and piston means interconnecting the side bars and one of the cross bars, and means for supplying fluid to said means to

extend said means and apply the desired amount of traction.

11. A traction device as defined in claim 7 wherein a plurality of appliance attaching clips are movably mounted one one of said cross bars.

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