

[72] Inventor **Ray V. Hendrickson**
235½ 33rd St., West Palm Beach, Fla.
33407
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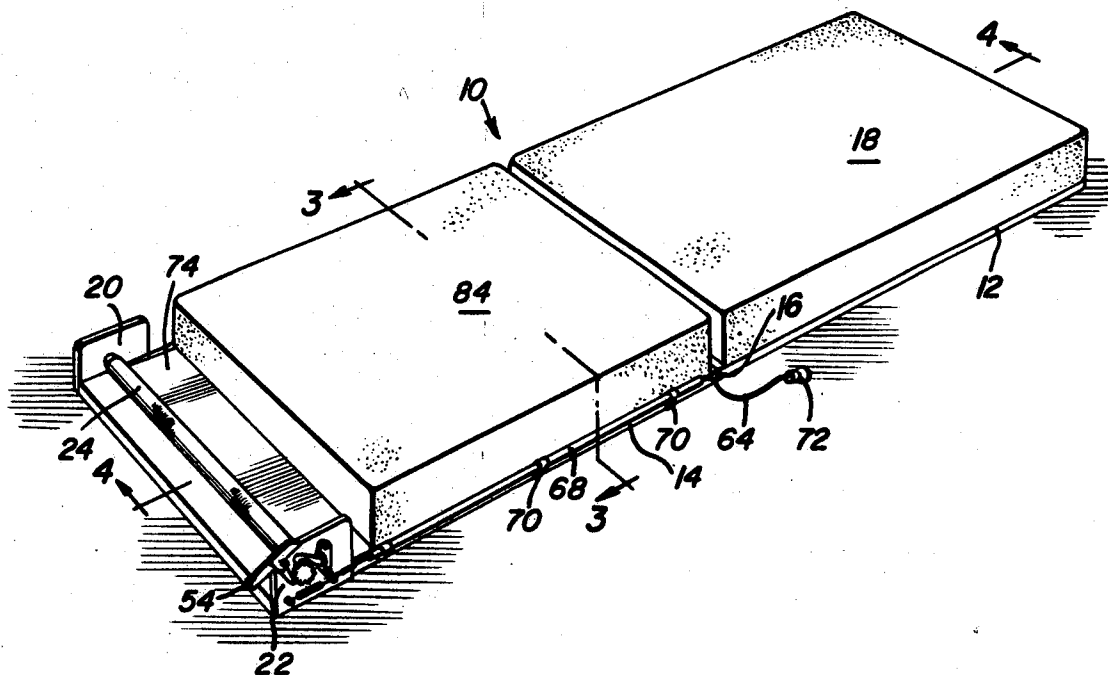
Primary Examiner—L. W. Trapp
Assistant Examiner—J. Yasko
Attorneys—Clarence A. O'Brien and Harvey B. Jacobson

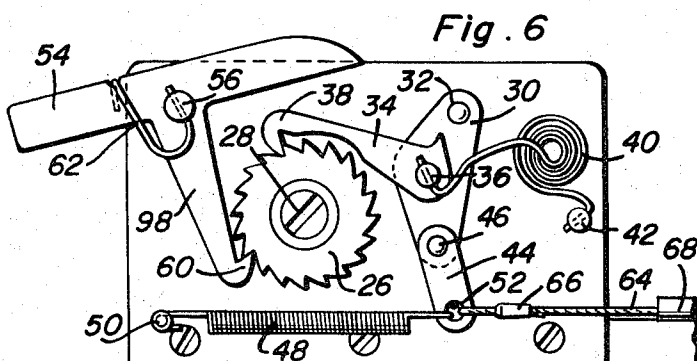
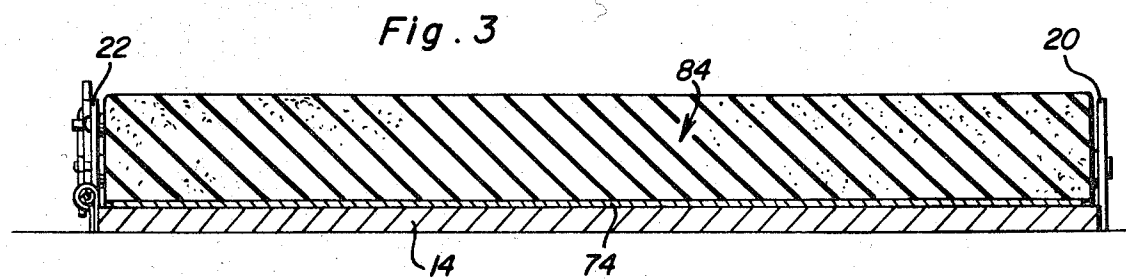
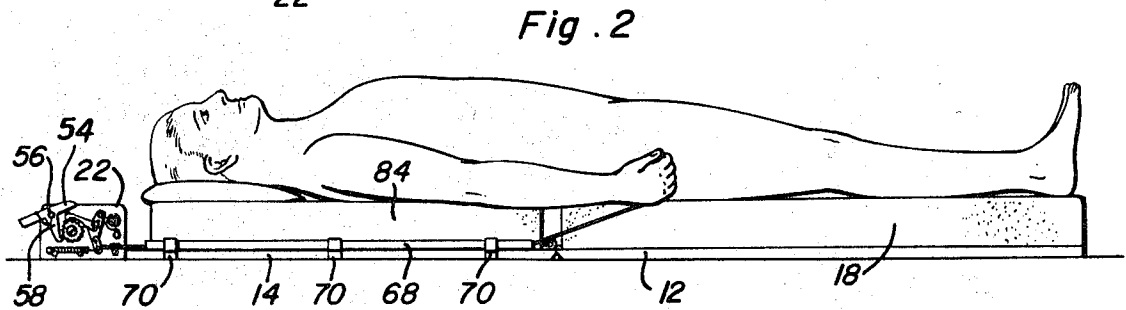
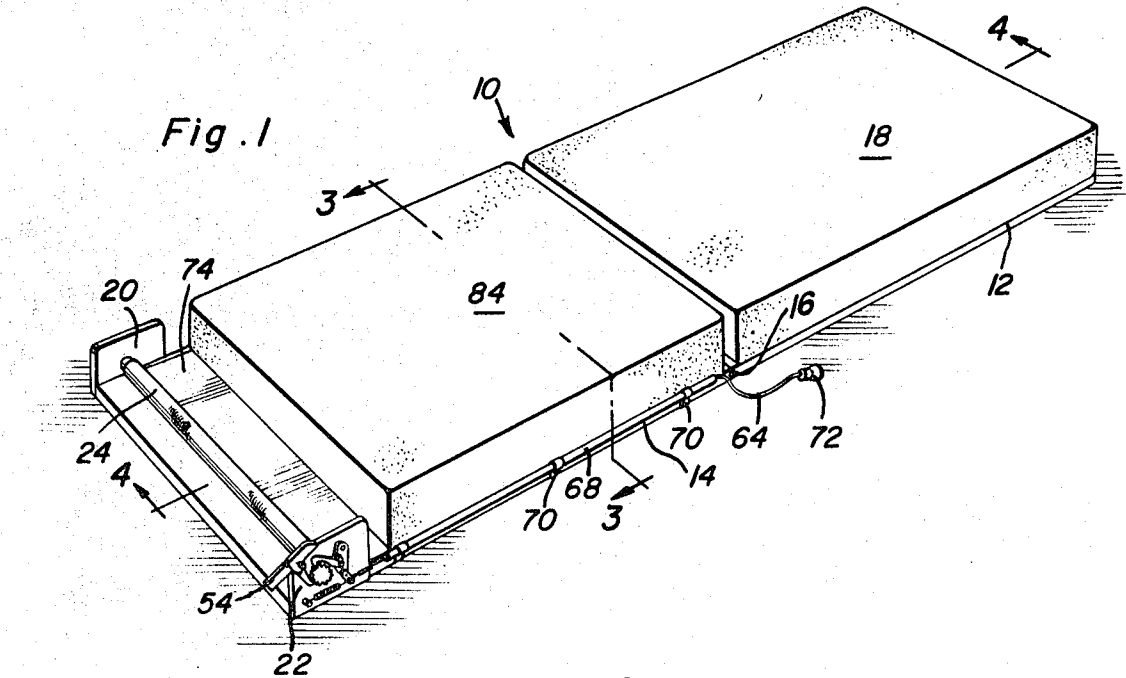
[54] **TRACTION DEVICE**
7 Claims, 7 Drawing Figs.

[52] U.S. Cl. 128/71
[51] Int. Cl. A61f 5/00
[50] Field of Search..... 128/71, 69,
70, 73, 74, 75, 78, 84; 272/79, 80

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ABSTRACT: A traction device that is divided into two sections with one section moving relative to the other so that when the human body reclines thereon said portion of the body lying on the movable section is pulled relative to that portion of the body lying on the relatively fixed section. The surface of the two sections is resilient so that the body sinks therein producing a frictional holding or purchase on sections of the body to facilitate the exertion of the tractive force thereon.





Ray V. Hendrickson
INVENTOR.

BY *Clarence A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

Fig. 4

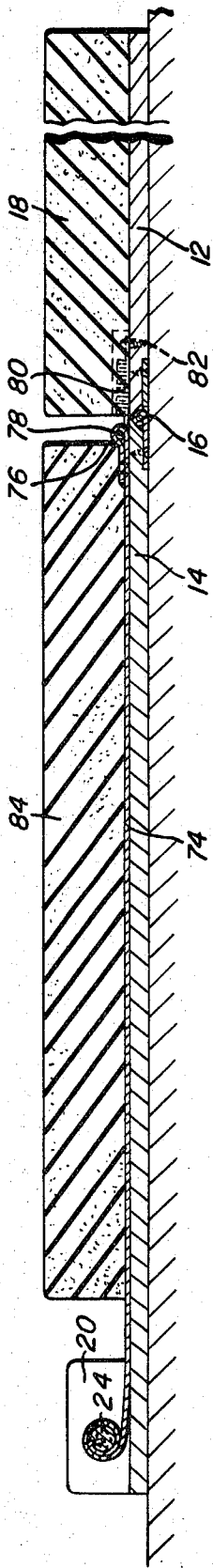


Fig. 5

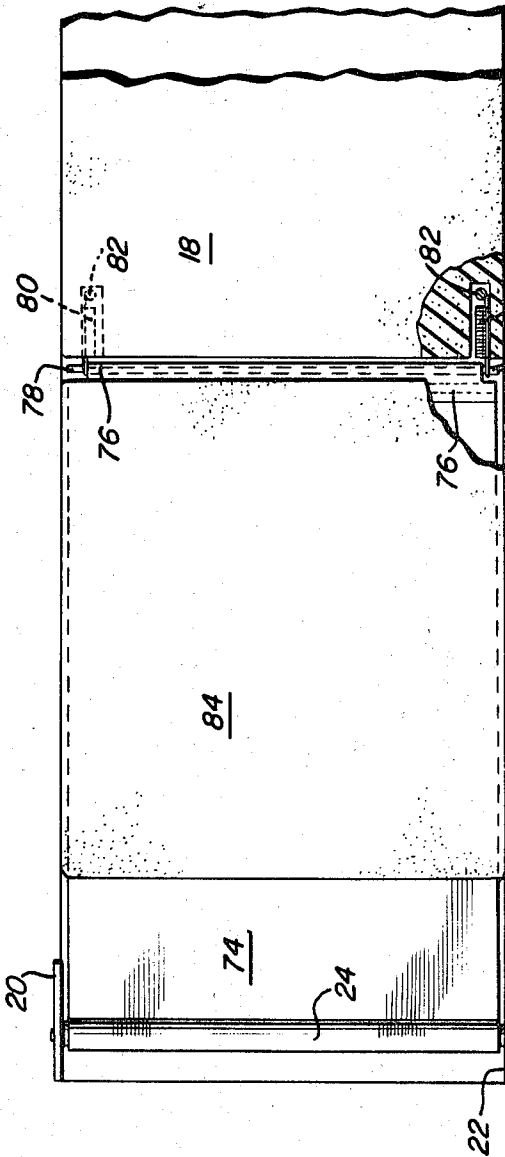
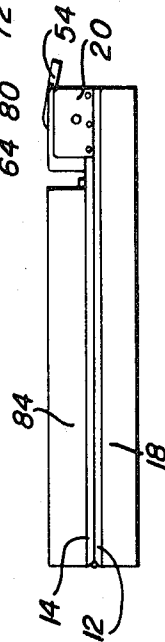


Fig. 7



Ray V. Hendrickson
INVENTOR.

BY *Lawrence A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

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TRACTION DEVICE

The present invention relates to a supporting surface for a human body that when lying thereon will produce a tractive force within the human body. The surface is divided into two sections, with one section movable relative to the other section. The sections are covered with a deep resilient material, such as a foam rubber. The foam being resilient, the body sinks into or depresses the foam, thereby producing a frictional grabbing or purchase on the body portions. The movable section is then moved relatively away from the fixed section, thereby producing a tractive force in the human body between the portions of the body supported on the two sections of the supporting surface. The relative movement of the two sections may be controlled by the patient lying on the supporting surface by an incremental ratchet-type drive to advance the movable section to produce the degree of traction required.

Heretofore, portions of the body into which the tractive force was to be transmitted had to be attached, such as by harnesses or belts, to one surface and then weights or tractive members attached to another portion of the body to, in effect, pull the body as in the old torture device, the rack. With the instant device, there is no need to secure the body to fixed surfaces and movable surfaces. The pulling or purchase is produced by the depression of the body into the resilient surfaces. The unique ratchetlike mechanism moves the members relative to one another so that the patient can actuate the mechanism, thereby being able to utilize the device without the help of a second person.

It is therefore an object of the present invention to provide a simple but unique traction-applying device.

It is a further object of this invention to provide a traction device that does not require the patient to be strapped thereon.

It is a still further object of this invention to provide a traction device that can be utilized by the patient, and thereby not require the aid of a second person.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a perspective view of the instant traction device with the two sections in their initial position.

FIG. 2 is a side elevational view of the device with a patient thereon with the sections partially moved relative to one another to exert a tractive force.

FIG. 3 is a sectional view, on an enlarged scale, taken substantially along the line 3-3 of FIG. 1.

FIG. 4 is a sectional view, on an enlarged scale, taken substantially along the line 4-4 of FIG. 1.

FIG. 5 is a top plan view of the device with some of the foam pad cut away to show the connection between the movable section and the fixed section.

FIG. 6 is a side elevational view of the ratchet mechanism that provides for the movement of one of the sections.

FIG. 7 is a side view of the device in a folded configuration for storage or transporting.

Referring now to the drawings the traction device is indicated generally by the numeral 10, with its main support comprising two panels 12 and 14 hinged together by hinges 16. A deep foam pad 18 generally conforms to and is fixed to the hinged panel 12, with the panel 12 and foam pad 18 forming the relatively fixed section of the traction device. A pair of plates 20 and 22 are fixed to the end of panel 14 remote from the hinge 16 in upstanding relationship thereto with a roller 24 journaled on the plates 20 and 22 for rotation therebetween. The end of the roller 24 journaled in plate 22 extends therethrough and has a ratchet wheel 26 secured for rotation therewith by means of the bolt 28. A ratchet movement device is mounted on plate 22 to provide the rotational force for the roller 24. The ratchet device has a lever 30 pivoted to plate 22 at its upper end thereof by pivot pin 32. A ratchet member 34

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is pivoted to the lever 30 generally at its midpoint by the pivot pin 36 which is fixed to the ratchet 34 and journaled for rotation in lever 30. The ratchet lever 34 extends beyond and overlies the ratchet wheel 26 so that the hook hook-shaped end 38 thereof can engage the teeth of the ratchet wheel. A spiral torsion spring 40 is mounted at one end in a hole in a pin 42 which is fixed on the plate 22. The other end of the spiral torsion spring extends through a hole in the pivot pin 36, which since it is fixed to the bracket member, imparts a counterclockwise rotation to the ratchet member 34 thereby maintaining the end 38 thereof in constant engagement with the ratchet wheel 26. A link 44 is fixed to the end of lever 30 remote from pivot point 32 by means of a rivet 46. Thus, the link 44 and lever 30 pivot as a unit about point 32, with the ratchet member 34 pivoted on lever 30 so as to be in constant engagement with the ratchet wheel 26 at the counterclockwise urging of the spiral torsion spring 40. A coil tension spring 48 is mounted at one end to a pin 50, which is secured to the plate 22 at the lower edge thereof remote from the hinge point of the panels 12 and 14, and the other end of the spring 48 is looped through a hole 52 in the end of the link 44. The spring 48 thus biases the ratchet mechanism into its at rest or initial position, thereby providing for the urging of the ratchet to drive the ratchet wheel.

To prevent unwanted counterclockwise rotation of the ratchet wheel, an elongated lever 54 is pivoted about a pin 56 fixed to the plate 22 at the upper corner thereof. A pawl 58 is attached generally to the midpoint of the lever 54, at the pivot point 56 thereof, to extend downwardly and engage the teeth of the ratchet wheel 26 with the end 60 thereof. A generally U-shaped spring 62 has one end extending through hole in pin 56 and the other end looped around the handle of lever 54. This imparts a generally counterclockwise motion to the lever and pawl 54 and 58 respectively, thereby urging the end 60 into constant engagement with the teeth of the ratchet wheel 26. When it is desired to freely rotate the roller 24, and attached ratchet wheel 26, in a counterclockwise direction the pawl 58 can be disengaged therefrom by lifting on the handle end of the lever 54.

To provide for remote operation of the ratchet mechanism by the patient utilizing the traction device, a cable 64 is attached to the hole 52 in the end of link 44 by any suitable means such as by the clamp 66 shown in the drawings. A tube 68 extends from a point adjacent the end of plate 22 to the other end of panel 14 adjacent the hinge thereof and is fixed to the panel by means of tube clamps 70. The cable thus extends from the link 44 through the tube to a point beyond the hinge point 16 of the panel with a convenient pull device 72 mounted thereon for the patient to grasp and exert the pull thereon necessary to drive the ratchet mechanism.

An elongated carrier sheet of flexible material 74, such as canvas or vinyl, extends along the upper surface of the hinged panel 14 and is attached and rolled onto the roller 24. The free end of the sheet 74 is located adjacent the hinge 16 where a loop 76 is sewed thereon. A rod 78 extends transversely through the loop 76 and is substantially the width of the hinged panels 12 and 14. A pair of tension coil springs 80 have one end thereof looped over each end of rod 78 extending beyond the loop 76, and the other ends thereof fixed to the hinged panel 12 by any convenient means, such as by a screw 82 as shown in the drawings. The spring 80 at each end of the rod 78 tends to pull the flexible sheet 74 off the roller, or keep it taut or in a state of tension between its ends.

Foam pad 84, the same thickness as pad 18, is fixed to the flexible sheet 74 adjacent its free end and extends to a point near the plates 20 and 22. The foam pads 18 and 84 are identical as to consistency, that is they allow the body of the patient to settle therein thereby producing a frictional holding force thereon. Thus when the patient exerts a pull on the cable 64 he pulls the link and lever, 44 and 30 respectively, which causes the ratchet to advance the ratchet wheel 26 in a clockwise position thereby rolling the flexible sheet 74 thereon. This rolling of the sheet 74 onto the roller causes the

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foam pad 84 to move away from the pad 18 in opposition to the springs 80. Thus it can be seen if a person has positioned his waist at approximately the hinge point 16 of the panel the moving of the foam pad 84 away from the pad 18 will produce a tractive force within his body. It is thus obvious that any portion of the body may be positioned on the pads 18 and 84 to produce a tractive force in whatever member desired. The simplicity of operation does not require that a person get into a harness or in any other way fix his body to two movable panels as has heretofore been necessary. The remote placement of the ratchet operating cable also simplifies the use of the device by a person without having to have anyone near at hand to enable him to use the device.

To facilitate the storage of the device when not in use, or the transporting of the device with the patient who desires to use it, the hinge point 16 allows the panels 12 and 14 to be pivoted into a parallel relationship abutting one another, as shown in FIG. 7. Thus, the device is not only simple to use and able to be used by a single person, but is convenient to transport or store.

The traction device also lends itself to the application of tractive force to a single limb, e.g. a smooth sheet can be inserted under one leg of a user thereby defeating the gripping power of the pad which will thereby apply the tractive force to the leg resting on the pad. Similarly, if a twisting tractive force is required, such as in the hips, one hip can be raised on a pillow and the tractive force will then be applied in a twisting manner. Also, with the basic design of the device showing one relatively movable pad, it can be seen that a plurality of movable pads can be applied to the basic structure to provide for specialized applications or where different tractive forces are required in different directions.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

I claim:

1. A traction device, comprising: stationary support means, a resilient body engaging pad on said support means, a motion producing assembly mounted on said support means, a flexible

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carrier member disposed in slidable overlying relation to the support means and connected to said assembly, and a second resilient body-engaging pad mounted on said carrier member to be moved laterally outwardly relative to said first named resilient pad in response to outward displacement of the carrier member by the motion-producing means.

2. The device of claim 1 wherein said support means includes a first and second panel hinged together for rotation about said hinge into a parallel juxtaposed relation.

3. The device of claim 2 wherein said first named resilient pad is fixed to said first panel.

4. The device of claim 3 wherein said assembly is mounted on said second panel on the end remote from said hinge and the movable member extends from said assembly over said second panel to said hinge points.

5. The device of claim 4 wherein said movable member is a flexible sheet with one end attached to said assembly and the other end thereof resiliently attached to said first panel adjacent the hinge.

6. A traction device, comprising: support means, a resilient body engaging pad on said support means, a motion-producing assembly mounted on said support means, a movable member connected to said assembly, and a second resilient body-engaging pad mounted on said movable member to be moved relative to said first named resilient pad, said support means including a first and second panel hinged together for rotation about said hinge into a parallel juxtaposed relation, said first named resilient pad being fixed to said first panel, said assembly being mounted on said second panel on the end remote from said hinge and the movable member extending from said assembly over said second panel to said hinge points, said movable member being a flexible sheet with one end attached to said assembly and the other end thereof resiliently attached to said first panel adjacent the hinge, said assembly including a roller with the one end of said sheet attached thereon and a ratchet device to impart rotation to said roller to roll the sheet thereon in opposition to the resilient attachment of the other end thereof.

7. The device of claim 6 wherein the ratchet device is operated by a force transmitting means with one end located near the hinge point of the panel and the other end attached to the ratchet device.

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