

April 16, 1963

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3,085,768

THERAPEUTIC TRACTION DEVICE

Filed Jan. 9, 1962

3 Sheets-Sheet 1

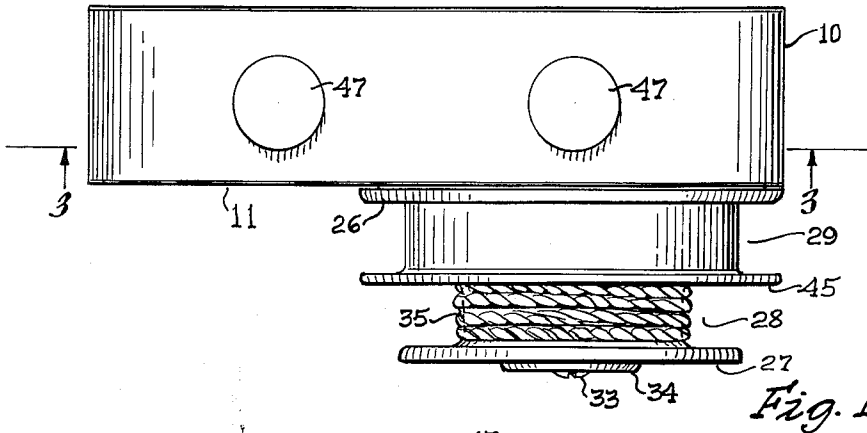


Fig. 1.

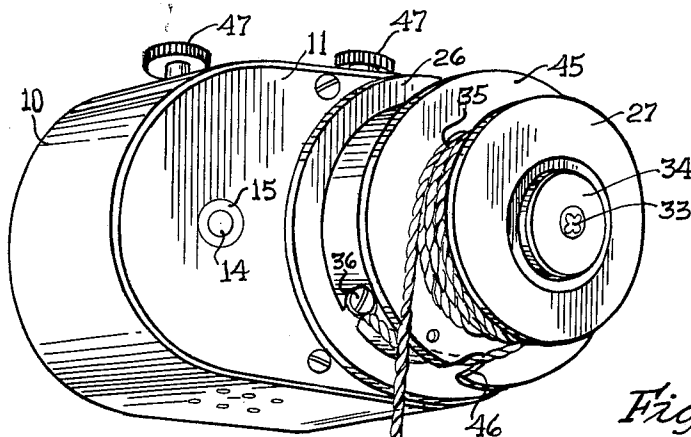


Fig. 2.

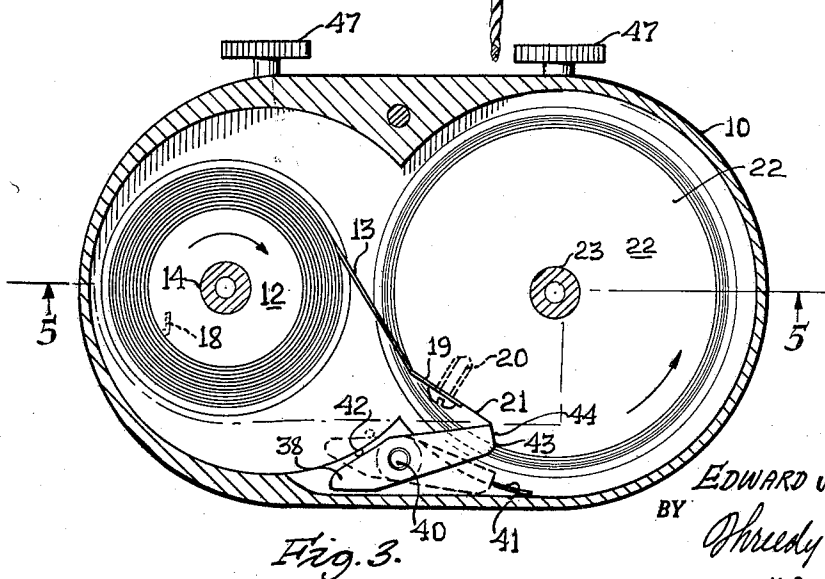


Fig. 3.

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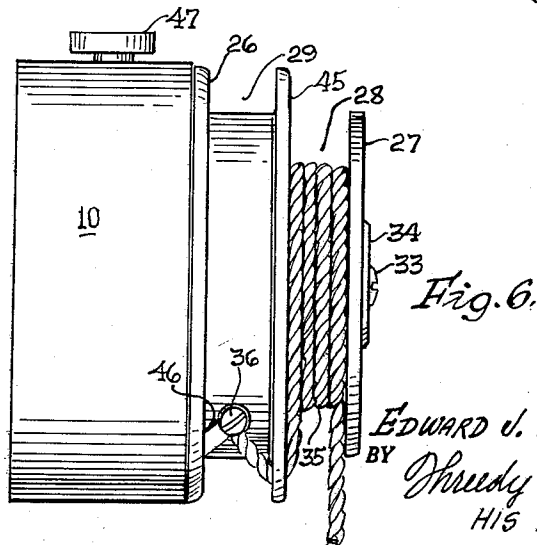
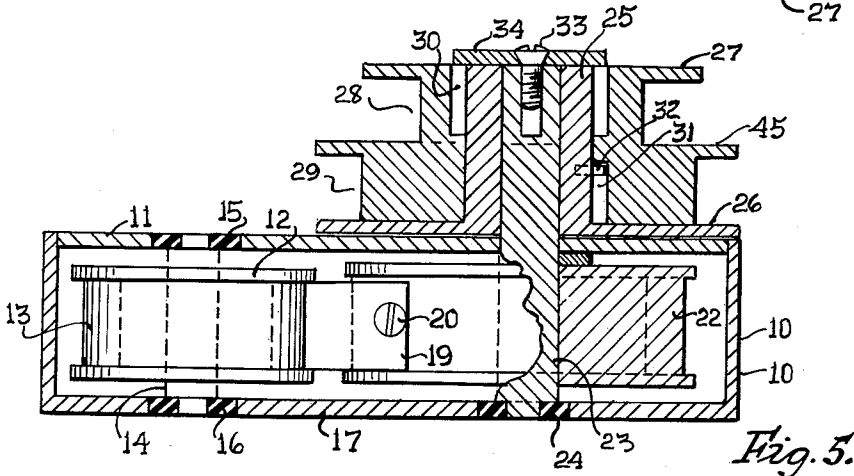
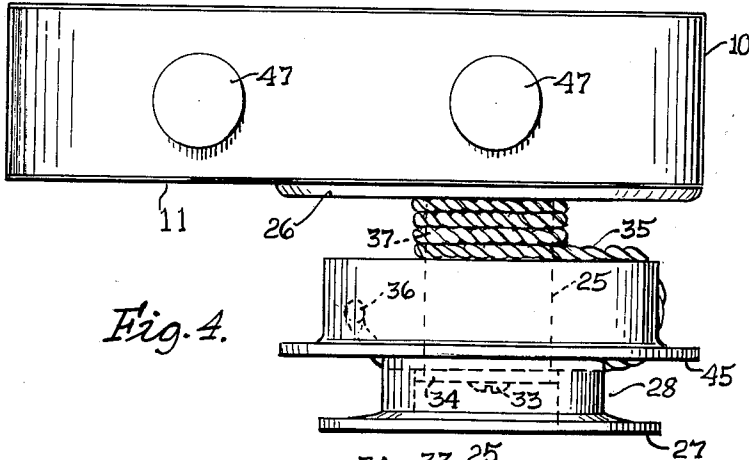
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THERAPEUTIC TRACTION DEVICE

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3 Sheets-Sheet 2



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THERAPEUTIC TRACTION DEVICE

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3 Sheets-Sheet 3

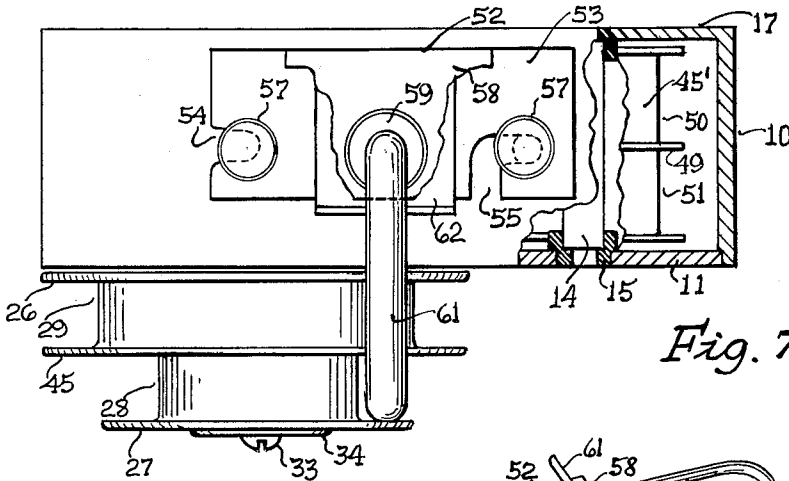


Fig. 7.

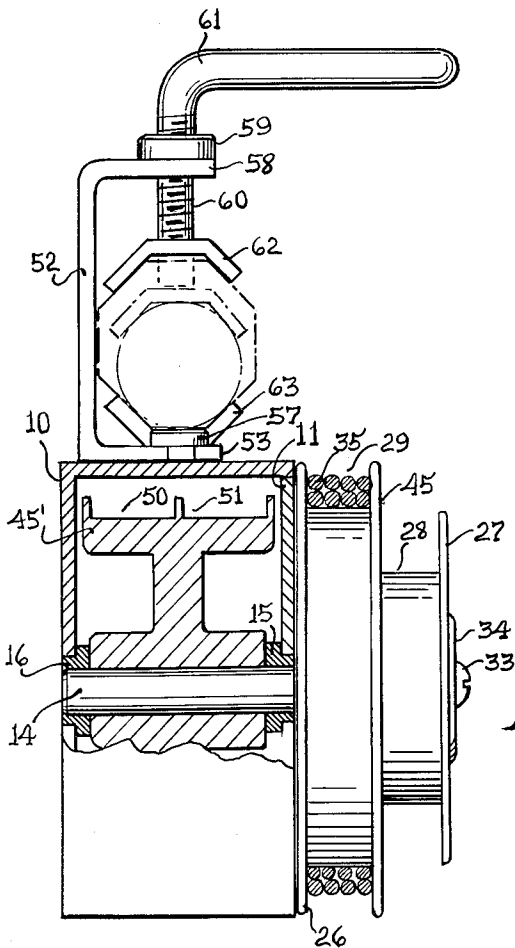


Fig. 8.

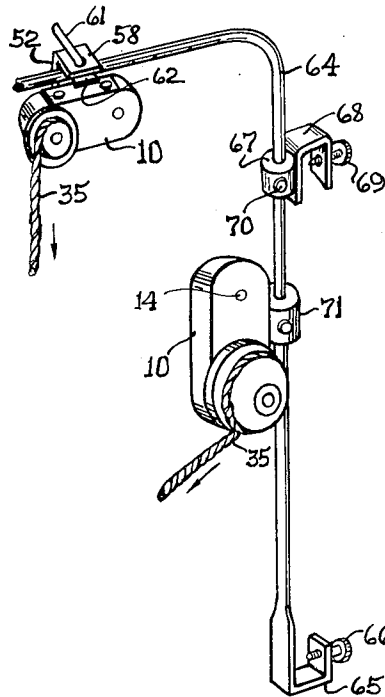


Fig. 9.

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3,085,768
THERAPEUTIC TRACTION DEVICE
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 8 Claims. (Cl. 242-107)

My invention relates to a new and useful improvement in a therapeutic traction device and more particularly to a constant tension traction device which permits a simple, yet effective, application of therapeutic traction treatment upon any part of the body.

The principal object of this invention is to provide in a therapeutic traction device of this character a means for providing a plurality of different traction tensions.

Another object of my invention is in a therapeutic traction device of this character of a means for maintaining a constant predetermined tension.

A further object of this invention is in the provision in a device of this character of an arrangement of parts whereby a patient in need of therapeutic traction treatments due to cervical, lumbar, or limb afflictions may conveniently and economically achieve self treatments without the necessity of trained supervision of an orthopedist, neurologist, and/or physiotherapeutic.

Yet another object of my invention is to provide in a device of this character, a construction resulting in a compact self-contained and highly portable traction device which affords universal adaptation for treatment to a patient in a seated or recumbent position, and so constructed to provide ambulatory therapeutic treatment.

A still further and equally important object of my invention is to provide in a device of this character a means which prevents the malfunction or application of an improper tension pressure through a mistaken mode of operation of the device.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a top plan view of my therapeutic traction device.

FIG. 2 is a perspective view of my therapeutic traction device.

FIG. 3 is a detailed sectional view taken on line 3-3 of FIG. 1.

FIG. 4 is a top plan view of my device similar to FIG. 1, but showing an application involving the concealed pulley having a different tension.

FIG. 5 is a detailed sectional view taken on line 5-5 of FIG. 3.

FIG. 6 is an end elevational view of my device.

FIG. 7 is a fragmentary sectional detailed top plan view of a modified form of my invention showing a mounting bracket therewith.

FIG. 8 is an end elevational fragmentary detailed view of the modified form of my invention, and

FIG. 9 is a perspective view showing a clamping device on which my therapeutic traction device is adjustably mounted.

This invention relates to a therapeutic traction device which includes a compact housing that contains a constant tensioning member. In this respect my traction device includes a hollow elliptical shaped body generally indicated as at 10. One side wall 11 of this body is removable and acts as a cover for the body 10. Positioned within the body 10 is a roller 12 upon which is coiled a constant tensioning member in the form of a spring 13. This roller 12 is fixedly carried by a shaft 14 which

has its ends mounted in composition bearings 15 and 16 provided by the removable side 11 and back wall 17 of the body 10. One end 18 of the constant tension spring 13 is fixedly attached to the roller 12 while the opposite free end 19 thereof is attached by means of a screw 20 to a notched out flat surface 21 of a winding roller 22.

The winding roller 22 is fixedly mounted on a rotatable shaft 23 which has one end mounted in a composition bearing 24 provided by the wall 17 of the body 10. The shaft 23 is of a length greater than the width of the body 10 and thus projects laterally through the removable side wall 11 as seen in FIG. 5. Fixedly mounted upon the exposed portion of the shaft 23 is a circular boss 25. This boss 25 provides an enlarged circular flange 26 which is adapted to lay in spaced parallel relation with the side wall 11.

Mounted upon the circular boss 25 for rotatable movement therewith and for longitudinal movement with respect to the long axis thereof is a member 27. This member 27 provides an exterior reel 28 and an interior reel 29. The reels so provided by the member 27 are of the construction whereby the exterior reel 28 has a base diameter which is less than the base diameter of the interior reel 29. This for a reason hereinafter made apparent.

A portion 30 of the center bore formed in the member 27 is of a diameter greater than the diameter of the circular boss 25, so that it sits in spaced relation with respect thereto. The member 27 is also provided with an internal keyway 31 which receives the free end of a key 32 which projects laterally from the periphery of the circular boss 25. Mounted by means of a screw 33 of the shaft 23 is a circular retaining washer 34. The washer 34 has a diameter equal to the diameter of the portion 30 of the center bore formed in the member 27. By the arrangement of the parts hereinbefore described the member 27 may be moved laterally away from the side cover 11 coaxially of the shaft 23 into the position shown in FIG. 4. When the member 27 is so moved, the retaining washer 34 is received in the portion 30 of the center bore formed in the member 27 and the key 32 is retained in the keyway 31, thus rotatably connecting the member 27 to the circular boss 25 which in turn is rotatably carried by the shaft 23. When the member 27 is thus moved coaxially of the circular boss 25, a concealed drum 37 will be exposed as seen in FIG. 4.

A traction cord 35 has one end attached as at 36 to the base of the interior reel 29 as seen in FIGS. 4 and 6. The traction cord 35 as shown in FIGS. 2, 4, and 6 may be wound around the exterior reel 28, the concealed drum 37, and the interior reel 29. As each of these reels has a different diameter there will result tractile forces representing different weight increments. In the present application of this invention the tension pressure on the traction cord 35 as it is pulled away from the body 10 produces the equivalent weight increments of a 5 lb. tractile force off the interior reel 29, a 7 lb. tractile force off exterior reel 28 and a 12 lb. tractile force off the concealed drum 37. As the traction cord 35 is pulled away from the body 10 it will cause rotation of the shaft 23 which in turn will cause rotation of the roller 22 within the housing 10 in the direction of the arrow as seen in FIG. 3. The rotation of the roller 22 rotates the roller 12 and unwinds therefrom the constant tension spring 13. The spring 13 upon further rotation of the roller 22 will wind itself about the periphery of such winding roller 22.

For the proper operation of my therapeutic traction device it is imperative that the rollers 12 and 22 carried within the housing 10 are caused to rotate in the direction of the arrows shown in FIG. 3. The constant tension member in the form of the spring 13 is of the construction shown and described in the United States Letters

Patent No. 2,609,191, and in order to perform as a constant tensioning member it must unwind from the roller 12 in the direction shown in FIG. 3 and be wound upon the winding roller 22 as shown in such figure.

To prevent rotation of the winding roller 22 in an opposite direction from that indicated in FIG. 3, I have provided a spring-urged latch mechanism. This latch mechanism includes a latch finger 38 pivotally mounted on a stud shaft 40 which extends between the side wall 11 and back wall 17. A spring 41 is coiled about the shaft 40 and has one end 42 in contact with one edge of the latch finger 38 on one side of the shaft 40 so as to yieldably maintain the latch finger 38 in the position shown in full lines in FIG. 3, wherein the free end 43 of the latch finger 38 will be in abutment with the shoulder 44 provided by the periphery of the winding roller 22. In the event that the traction cord 35 is wound around the exterior reel 28, the concealed drum 37 or the interior reel 29 in a direction reversely to that shown in FIG. 2, the reels together with the shaft 23 and winding roller 22 will be prevented from being rotated by any pull exerted on the traction cord 35.

To facilitate winding the traction cord 35 on to the exterior reel 28 the flange 45 of the interior reel 29 is notched as at 46, FIG. 2, and the cord 35 is permitted to pass therethrough.

Referring to FIGS. 7 and 8, I disclose a modified form of my invention in the respect that the roller 12 of the form shown in FIGS. 3 and 5 and hereinbefore described is of a different design.

In the modified form shown in FIGS. 7 and 8, roller 45' is rotatably mounted on shaft 14 in place of roller 12. Roller 45' has a periphery divided by flange 49 into equal compartments 50 and 51. I have found that I may conveniently replace the constant tension spring 13 of the device shown in FIGS. 3 and 5 with two constant tension spring members not shown. Each of the constant tension members may be contained in a side by side relation in the compartments 50 and 51 of the roller 45'. These constant tension spring members may be of different tensions so that the sum of their tension is the rotatable force required to rotate shaft 23 and its roller 22.

By this I mean that I could place in compartment 50 of roller 45' a constant spring member having a tension of six pounds and place in compartment 51 of roller 45' a constant tension spring member having eight pounds. The total of these constant spring members equals fourteen pounds and this is the amount of pull required to rotate shaft 23 and roller 22.

By this form of construction, I greatly increase the adjustability of operative tractional forces which may be obtained in my device.

In FIGS. 7 and 8, I also disclose a mounting clamp by which my device may be conveniently mounted in an operative position. This mounting clamp comprises a U-shaped bracket 52, one arm 53 of which is provided with passageways 54 and 55 which receive the stud portions 56 of mounting screws 57 carried by the top wall of the body 10. The opposite arm 58 provides a boss 59 through which a threaded portion 60 of a clamp 61 is journaled. The threaded end of the clamp 61 provides an angled latch plate 62 which cooperates with a confronting latch plate 63 carried by the arm 53 of the bracket 52. As is illustrated by the dotted lines in FIG. 8, this clamping bracket 52 may be removably mounted to supporting means having various configurations.

In FIG. 9 I disclose a mounting device whereby there is provided a support for my traction device 10. This mounting device includes a substantially L-shaped mounting support 64 one end of which provides a U-shaped clamp 65 and a fastening screw 66 threadably associated therewith. Journaled on the support 64 is a circular bearing 67 which carries a reversely extending substantially U-shaped clamp 68 which likewise is provided with a clamping screw 69 threadably associated therewith.

The circular bearing 67 is provided with a set screw 70 by which it may be fixedly attached in any adjusted position along the support 64. By this arrangement, the support 64 may be readily attached to a patient's bed, chair, wheel chair or the like. As is shown in FIG. 9, my device indicated at 10 may be removably connected to an adjustable circular bearing 71 to the support 64 or connected thereto through the clamp 52 as shown in FIGS. 7 and 8.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A therapeutic traction device including a portable housing, a constant-tensioning means rotatably carried within said housing, a rotatable shaft carried by said housing and having one end extending laterally through and from one side thereof, a roller rotatably carried by said shaft within said housing and having one end of the constant-tensioning means connected thereto, a tension developing member rotatably carried by said shaft externally of said housing, said tension developing member comprising a plurality of reels each having a different diameter for effecting varying degrees of tractile force upon a movable traction element carried thereby, and a movable traction element selectively connected to said tension developing member for causing rotation thereof and said roller so as to coil said constant-tension means upon said roller and thereby develop a constant tractile force through said tension developing member upon said movable traction element, with the degree of tractile force determined by the diameter of the reel to which said traction element is operatively connected.

2. A therapeutic traction device including a portable housing, a coiled constant-tensioning spring rotatably carried within said housing, a rotatable shaft carried by said housing and having one end extending laterally through and from one side thereof, a roller rotatably carried by said shaft within said housing and having one end of the coiled constant-tensioning spring connected thereto, a tension developing member rotatably carried by said shaft externally of said housing, said tension developing member comprising a plurality of reels each having a different diameter for effecting varying degrees of tractile force upon a movable traction element carried thereby, and a movable traction element selectively connected to said tension developing member for causing rotation thereof and said roller so as to wind said coiled constant-tensioning spring upon said roller and thereby develop a constant tractile force through said tension developing member upon said movable traction element, with the degree of tractile force determined by the diameter of the reel to which said traction element is operatively connected.

3. A therapeutic traction device including a housing, a constant tensioning member rotatably carried within said housing, a rotatable winding roller within said housing and to which one end of said tensioning member is fixed and upon which said member is adapted to be wound when said winding roller is caused to be rotated, a reel having a predetermined diameter carried externally of said housing for rotating said winding roller under tension from said constant tensioning member, a traction element removably coiled upon said reel for causing rotation of said reel and said winding roller as said element is withdrawn from said reel, and a second reel of a diameter different from the diameter of said first mentioned reel and actuated by said traction element for rotating said roller so as to wind said tensioning member thereon

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so as to develop a different tractile force upon said traction element.

4. A therapeutic traction device including a portable housing, a constant-tensioning means rotatably carried within said housing, a rotatable shaft carried by said housing and having one end extending laterally through and from one side thereof, a roller rotatably carried by said shaft within said housing and having one end of the constant-tensioning means connected thereto, a tension developing member rotatably carried by said shaft externally of said housing, said tension developing member comprising a plurality of reels each having a different diameter for effecting varying degrees of tractile force upon a movable traction element carried thereby, and a movable traction element selectively connected to said tension developing member for causing rotation thereof and said roller so as to coil said constant-tensioning means upon said roller and thereby develop a constant tractile force through said tension developing member upon said movable traction element, with the degree of tractile force determined by the diameter of the reel to which said traction element is operatively connected, and means within said housing and engageable with said roller to prevent initial rotation thereof in one direction.

5. A therapeutic traction device including a portable housing, a coiled constant-tensioning spring rotatably carried within said housing, a rotatable shaft carried by said housing and having one end extending laterally through and from one side thereof, a roller rotatably carried by said shaft within said housing and having one end of the coiled constant-tensioning spring connected thereto, a tension developing member rotatably carried by said shaft externally of said housing, said tension developing member comprising a plurality of reels each having a different diameter for effecting varying degrees of tractile force upon a movable traction element carried thereby, and a movable traction element selectively connected to said tension developing member for causing rotation thereof and said roller so as to wind said coiled constant-tensioning spring upon said roller and thereby develop a constant tractile force through said tension developing member upon said movable traction element, with the degree of tractile force determined by the diameter of the reel to which said traction element is operatively connected, and means within said housing and engageable with said roller to prevent initial rotation thereof in one direction.

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6. A therapeutic traction device including a housing, a constant tensioning member rotatably carried within said housing, a rotatable winding roller within said housing and to which one end of said tensioning member is fixed and upon which said member is adapted to be wound when said winding roller is caused to be rotated, a plurality of reels each having a different diameter and carried externally of said housing for rotating said winding roller under tension from said constant tensioning member, and a traction element coiled upon a selected reel for causing rotation of said winding roller as said element is withdrawn from said selected reel, and means within said housing and engageable with said roller to prevent initial rotation thereof in one direction.

7. A therapeutic traction device including a housing, a constant tensioning member rotatably carried within said housing, a rotatable winding roller within said housing and to which one end of said tensioning member is fixed and upon which said member is adapted to be wound when said winding roller is caused to be rotated, a plurality of reels each having a different diameter and carried externally of said housing for rotating said winding roller under tension from said constant tensioning member, and a traction element coiled upon a selected reel for causing rotation of said winding roller as said element is withdrawn from said selected reel.

8. A therapeutic traction device including a housing, a constant tensioning spring rotatably carried within said housing, a rotatable winding roller within said housing and to which one end of said tensioning spring is fixed and upon which said spring is adapted to be wound when said winding roller is caused to be rotated, a plurality of reels each having a different diameter and carried externally of said housing for rotating said winding roller under tension from said constant tensioning spring, and a traction element coiled upon a selected reel for causing rotation of said winding roller as said element is withdrawn from said selected reel.

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