

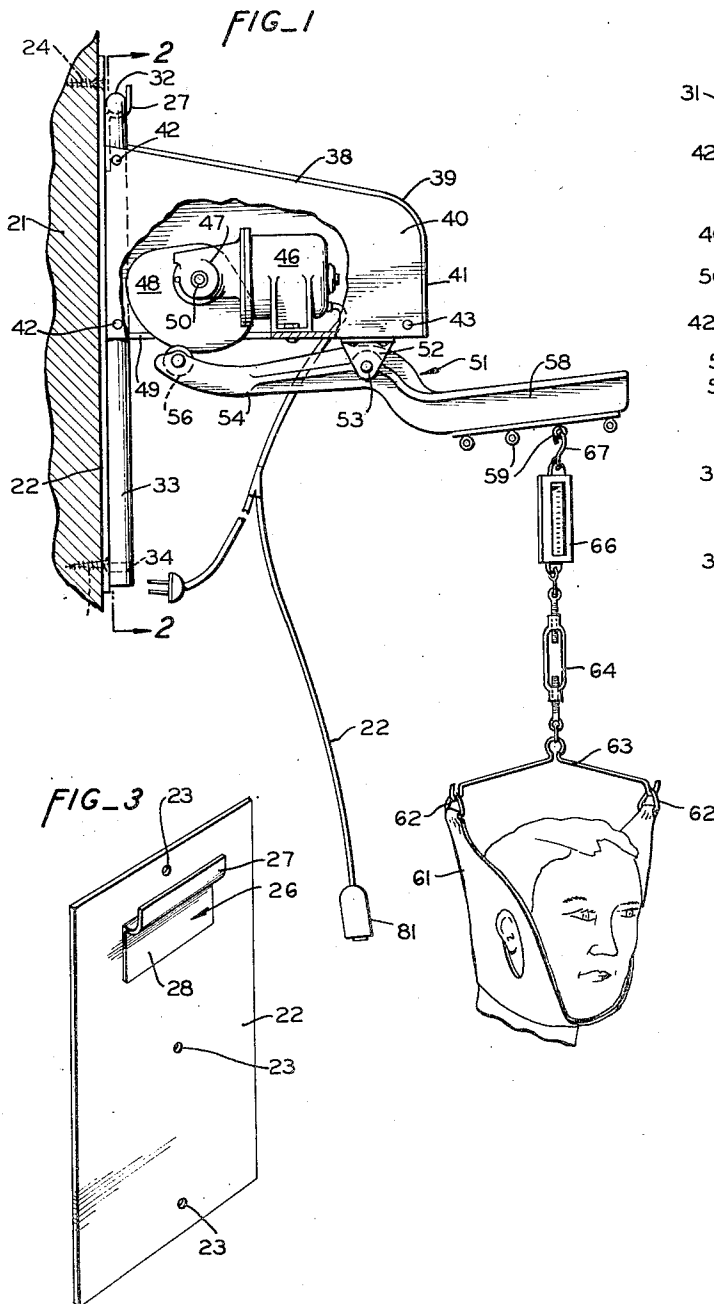
Nov. 5, 1957

F. C. RICHARDS
PORTABLE TRACTION UNIT

2,811,965

Filed Feb. 1, 1956

2 Sheets-Sheet 1



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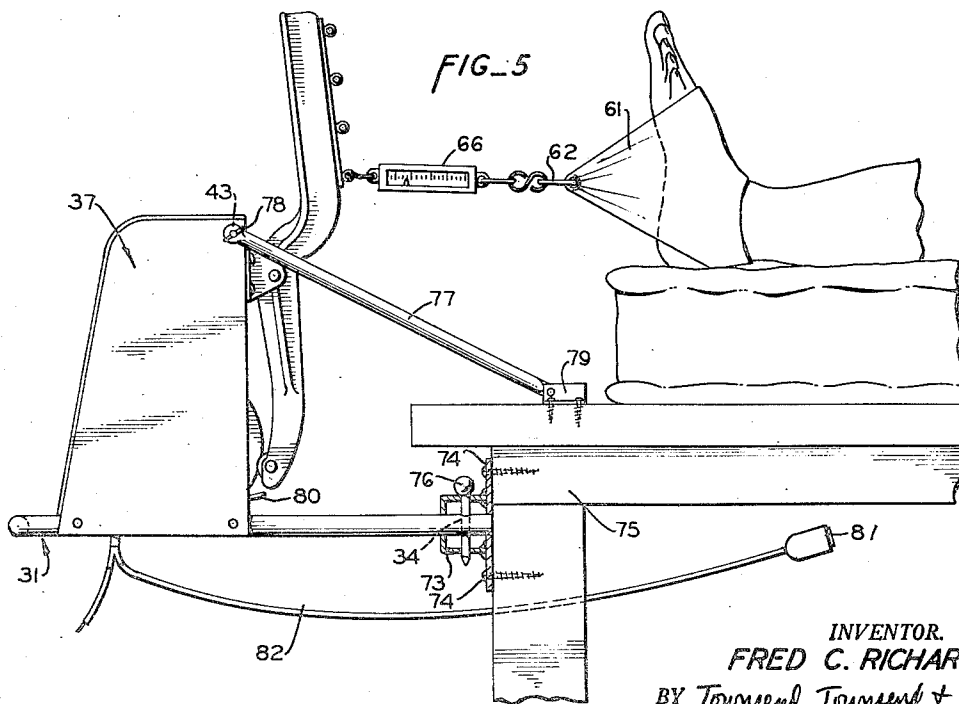
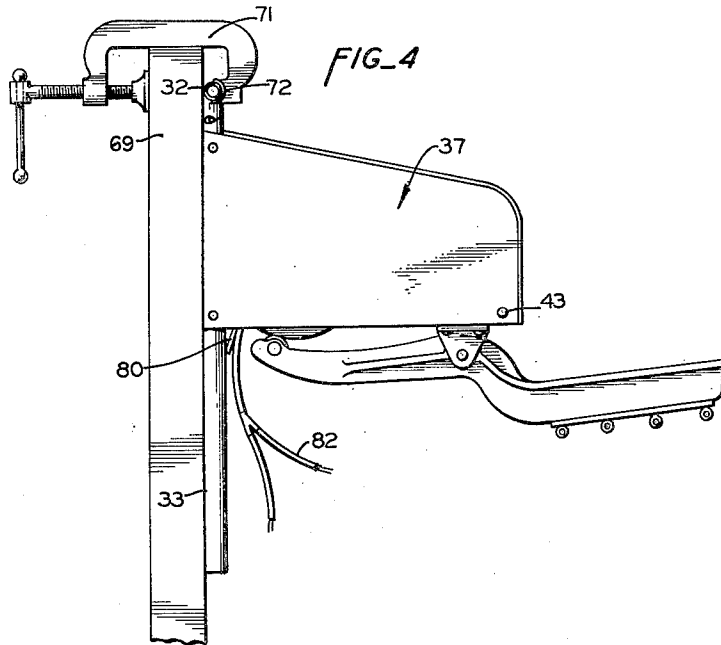
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PORTABLE TRACTION UNIT

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Application February 1, 1956, Serial No. 562,851

3 Claims. (Cl. 128—75)

This invention relates to a new and improved device for applying traction to the human body. It relates more particularly to a traction unit which can be used for either variable or steady traction and to the construction of the mounting of the device whereby it may be conveniently attached to a variety of different supports, depending upon the use to which the traction device is to be put.

Accordingly, one of the principal features and advantages of the present invention is the provision of a means for mounting the traction applying mechanism in such manner as to increase the versatility or variety of uses to which the device may be applied.

For example, one common use of a traction device is to create a reciprocating upward movement to a sling placed around the chin and neck of a patient. For such purpose, it is desirable that the traction applying apparatus be installed vertically above the patient, as by hanging from a wall. The present invention provides convenient means for hanging the device in such fashion.

Another common use of a traction device is to apply a substantially horizontal force to the foot of a patient while the patient is lying prone. The present device is adaptable for such use also.

The foregoing and other various ways in which the traction apparatus may be installed are described hereinafter in greater detail.

Another feature of the invention is the provision of the mounting means whereby the device may be hung from a wall by attachment to a mounting plate which is fastened to the wall in such manner that even when considerable force is applied, damage to the wall is prevented by spreading the area over which the force is transmitted to the wall structure.

A further feature of the invention is the mounting of the device which is arranged so that it may be quickly and conveniently removed from a wall or a table bracket when the apparatus is not in use.

An additional feature is a safety switch in the cord to allow the patient to stop the machine and to start it again whenever desired.

Still another feature of this invention is found in its unusual compactness and light weight made possible through the arrangement of elements hereinafter disclosed.

Other features of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

Fig. 1 is a side elevation of the device partly broken away in section showing the traction applying apparatus attached to a wall;

Fig. 2 is an elevational view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the mounting plate at-

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tached to the wall from which the traction apparatus is hung;

Fig. 4 is a side elevation showing a modified means of attaching the device to a door; and

Fig. 5 is a side elevation showing the device turned 90° from the position shown in Fig. 1 and attached to a table for applying a horizontal traction force.

A principal use of the present apparatus is in applying a vertical force, whereupon the apparatus is preferably mounted on a wall above the head of a patient. Accordingly, as shown in Figs. 1 and 2, the device is illustrated applied to a wall 21. For such purpose a substantially rectangular plate 22 of extended width and length is formed with screw holes 23 in the center line thereof, through which are inserted screws 24 which fasten the plate 22 to the wall stud. The upper end of the plate 22 is provided with a bracket 26 having an outwardly and upwardly curved hanging member 27 projecting from an anchoring support 28 which is permanently bonded to the plate in a suitable manner.

The traction device is mountable and demountable relative to the bracket 26. Accordingly there is provided a U-shaped frame 31 having a horizontal connecting portion 32 and depending elongated legs 33. For a purpose which hereinafter appears, holes 34 are formed adjacent the ends of the legs. The connecting portion 32 of the frame fits over and is retained by the bracket 26. Projecting outwardly in a direction substantially perpendicular to the direction of the legs 33 and extending from approximately their midpoint is a rigid motor support plate 36. Fitting around and enclosing the driving mechanism hereinafter described, which is positioned on the plate 36, is a casing 37. The top 38 of the casing 37 projects downwardly forwardly from a position near the upper ends of the legs 33 and is formed with a bend 39 at the front top corner thereof and a downwardly extending front 41 which joins the outer end of the plate 36. Bolts 42 fasten the sides 40 of the casing to the legs 33. Support holes 43 are formed adjacent the front bottom corners of the sides 40 so that a support bracket may be easily attached to the device as appears later herein.

An electric motor 46 is secured to the support plate 36. This motor 46, through a reduction gear 47, drives a cam 48, the edge of which projects through a slot 49 in plate 36. The cam 48 is secured to a reduction gear shaft 50. The outer end of the shaft 50, projecting from the reduction gear 47, is supported by a pillow block 50a. Thus, as the motor turns, the cam 48 slowly revolves. The shape of the cam is such as to apply the traction force in the manner hereinafter set forth.

A rocker arm 51 is mounted on the lower surface of plate 36 by means of hangers 52 projecting vertically downward therefrom. The arm is secured to the hangers by means of pivot pin 53 which extends horizontally through the hangers 52 at the approximate midpoint of arm 51.

One portion of rocker arm 51 comprises a cam engaging portion 54 having rotatively mounted at its upper extremity a cam follower roller 56. Roller 56 is formed with a groove 57 whereby flanges on either side of the groove 57 engage the side edges of cam 48 and retain the roller in tracking relationship with the cam. The eccentric motion of the cam 48 is transmitted to the rocker arm 51 through the roller 56.

The opposite portion of the rocker arm 51 comprises a traction portion 58 which extends substantially parallel to the portion 54, but is offset downwardly therefrom. A plurality of eyes 59 are provided on the bottom edge of the traction arm 58 and any one of them may be employed to connect the traction apparatus hereinafter

described. By proper selection of a particular eye 59, the force or leverage applied may be adjusted.

As heretofore set forth, there is provided a simple means for applying traction wherein the motor 46 and cam 48 are located immediately adjacent the rocker arm 51 which applies the traction force to the patient.

A sling 61 is used to embrace the chin and neck of the patient. The sling 61 extends above the sides of the head and terminates in ears 62 which are attached to the outer ends of bail 63. Bail 63 is connected to a turn-buckle 64 so that the elevation of the sling 61 may be adjusted. A scale 66 may be interposed between the sling 61 and the traction arm 58 so that the attendant may observe whether a proper amount of force is being applied. The hook 67 on the upper end of the scale 66 is used to attach the apparatus to the proper eye 59.

In the modification shown in Fig. 4, a C-clamp 71 is used to secure the connecting portion 32 of the frame 31 to a stationary support such as the upper end of the head 69 of a door. Preferably a rounded anvil 72 is provided on the C-clamp to engage the round tubular connection 32. In other respects the apparatus is mounted and operates in the same manner as in the previous means for attaching the same.

Fig. 5 shows a means whereby the device may be attached for horizontal traction movement. Accordingly there is provided a bracket 73 attached, by means of screws 74, to a stationary support, such as a table 75 on which the patient lies. Pin 76 extending through the holes 34 in the lower ends of the legs 33 attaches the legs 33 of the frame 31 to the bracket 73.

Means are provided to brace the device and to give it rigidity with respect to the stationary support. As illustrated, such means include a diagonally extending support arm or strut 77 which extends from the device to the stationary support. One end of the strut 77 is shown attached to the device at 43 as by means of fasteners 78 and the opposite end of the strut 77 is shown attached to the stationary support, as by means of an attachment plate 79. It will be appreciated that the design of these means may be changed in accordance with the desires of the designer.

In addition, means are provided to control the starting, stopping and direction of rotation of the cam. As illustrated, these means include a conventional off-on reversing switch 80 arranged in the device itself and another conventional off-on reversing switch 81 arranged at the end of an extension cord 82. These switches are both wired into the motor circuit in any manner known to those skilled in the art. The switch 80 may usually be used by an attendant and the switch 81 by a patient. Either switch is turned on to rotate the cam in a forward direction. If the force of the traction is too great, the device may be instantly reversed by either switch to relieve the patient. Further, the device may be stopped at any point in the cycle for steady traction.

Furthermore, the device may be quickly and conveniently mounted and demounted. The mounting of the device is extremely versatile inasmuch as it can be changed and positioned as the needs of the particular patient require. It is also apparent that the machine has a compactness, lightness and versatility heretofore unknown in the art. It can produce either a steady or a variable traction. Moreover, because the metal parts are compactly arranged, the complete device may be spaced from

the patient, making possible the simultaneous application of diathermy to the patient.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A portable traction device comprising a frame oriented in one plane, one side of said frame facing to the front and the other side of said frame facing to the rear; a rigid support plate projecting outwardly from the front of said frame in a plane substantially perpendicular to the plane of said frame; pivot means secured to said plate; a rocker arm mounted upon said pivot means; an electric motor secured to said plate; a cam driven from said motor, said cam being located between said front face and said pivot means; a cam follower on said rocker arm in tracking relationship with said cam; a traction apparatus connecting portion on said rocker arm extending outwardly beyond said pivot means; the rear of said frame being clear of operative elements; and means to receive the rear of said frame and to affix it to a variety of surfaces.

2. A portable traction device comprising a frame oriented in one plane, one side of said frame facing to the front and the other side of said frame facing to the rear; the side facing to the rear forming means to support the frame and being clear of operative elements; an apertured rigid support plate affixed to and extending forward from the front of said frame; said plate being in a plane substantially perpendicular to that of said frame; a rocker arm comprising a cam engaging portion and a traction arm portion; pivot means for mounting said rocker arm on said rigid support plate; an electric motor to cyclically motivate said rocker arm; a cam driven from said motor located between the front of said frame and said pivot means, positioned to pass through the aperture in said rigid support plate, and cooperating with said rocker arm; said motor, pivot means, cam and all of said rocker arm being positioned forwardly from said front of said frame; and means to receive and to affix the rear of said frame to a variety of surfaces.

3. A portable traction device comprising a frame, one side of said frame facing to the front and the other side of said frame facing to the rear; the side facing to the rear forming means to support the frame and being clear of operative elements; an electric motor positioned forwardly of the front of said frame; a pivot located forwardly of the front of said frame; and a rocker arm mounted on the pivot and extending forwardly beyond its pivot and the front of said frame motivated by said motor.

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