Jan. 17, 1967 J. C. RADFORD 3,298,364

THERAPEUTIC TRACTION DEVICE

Filed March 20, 1963 2 Sheets-Sheet 1

FIG_1

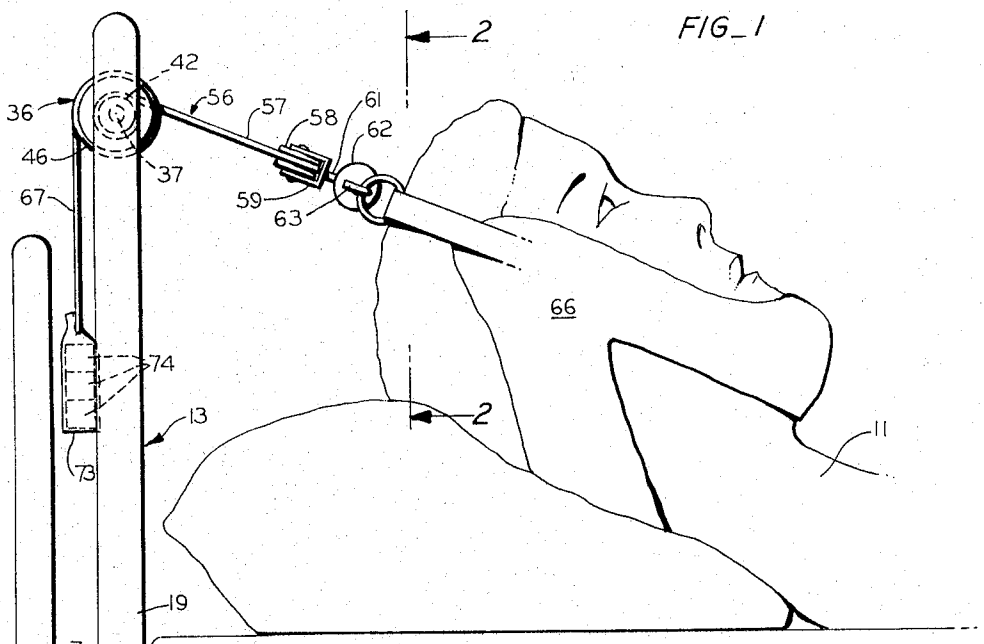
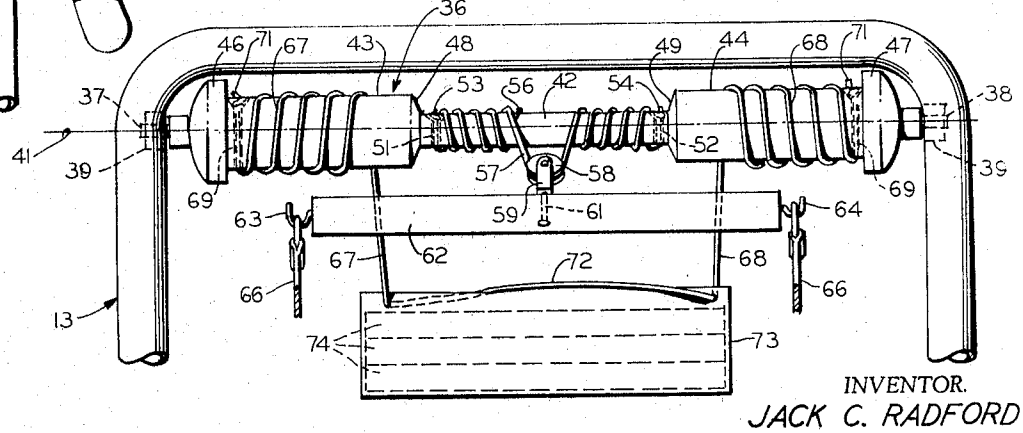


FIG_2



INVENTOR.
JACK C. RADFORD

BY Lothrop & West

ATTORNEYS

Jan. 17, 1967 J. C. RADFORD 3,298,364

THERAPEUTIC TRACTION DEVICE

Filed March 20, 1963 2 Sheets-Sheet 2

FIG_3

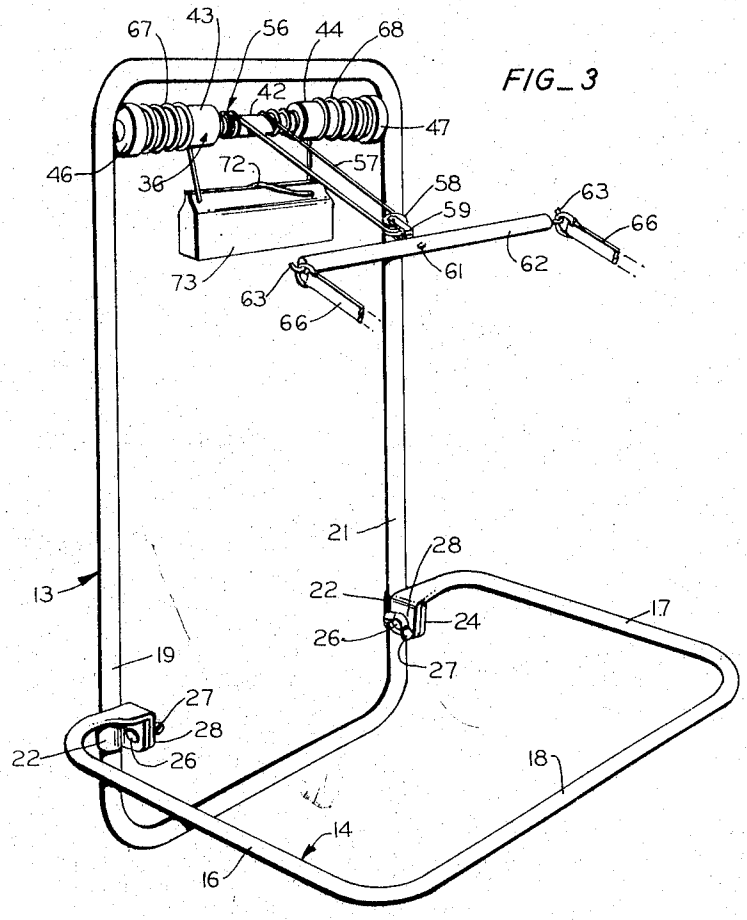


FIG_4

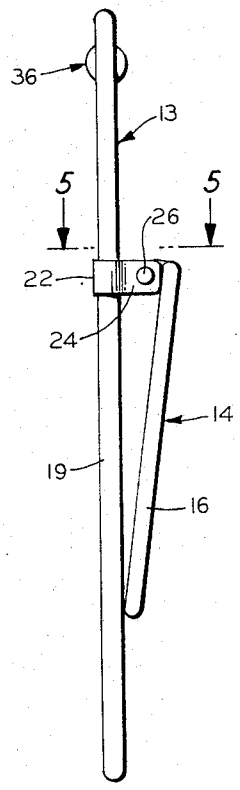


FIG_6

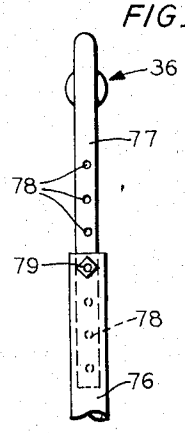
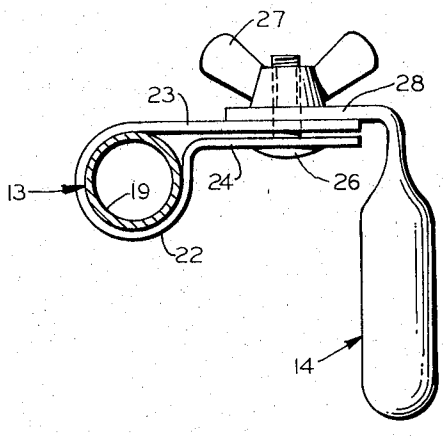


FIG_5



INVENTOR.
JACK C. RADFORD

BY Lothrop & West

ATTORNEYS

United States Patent Office 3,298,364 Patented Jan. 17, 1967

3,298,364

THERAPEUTIC TRACTION DEVICE

Jack C. Radford, 463 Wilde Ave.,
San Francisco, Calif. 94124

Filed Mar. 20, 1963, Ser. No. 266,653
5 Claims. (Cl. 128—75)

My invention relates to mechanism particularly for use in hospitals and homes or elsewhere for the treatment of patients who must undergo traction, particularly neck traction. While there are already available a number of mechanisms for use in exerting continuous pull on various portions of a patient's anatomy, most of these are of considerable bulk, weight and complexity and are confining in that they limit severely the degree of movement the patient may undertake.

It is therefore an object of my invention to provide an improved therapeutic traction device.

Another object of the invention is to provide a therapeutic traction device in which the patient undergoing traction has a relatively large degree of freedom of motion.

A still further object of the invention is to provide a therapeutic traction device which is portable in itself and can be utilized quickly and easily in connection with a bed, particularly a bed of the hospital type.

A still further object of the invention is to provide a therapeutic traction device which is light, compact, easily manufactured and maintained and readily available for quick use.

A still further object of the invention is to provide a therapeutic traction device effective to impose the desired amount of traction but arranged so that a patient may quickly be disengaged from the restraint of the device in emergencies.

Another object of the invention is to provide a traction device with a broad range of adjustment, particularly vertical adjustment. In the accompanying drawings:

FIGURE 1 is a side elevation of a therapeutic traction device pursuant to the invention as it is employed in connection with neck traction on a patient;

FIGURE 2 is a front elevation of the upper portion of the mechanism shown in FIGURE 1, the plane of the view being illustrated by the lines 2—2 of FIGURE 1;

FIGURE 3 is a perspective view of the therapeutic traction device apart from a bed and complete except for portions of the head halter;

FIGURE 4 is a side elvation of a portion of the therapeutic traction device in a folded condition;

FIGURE 5 is an enlarged detail showing a fastening structure, the view being in cross section, the plane of which is indicated by the line 5—5 of FIGURE 4; and

FIGURE 6 is a detail of a modified adjusting support yoke.

The therapeutic traction device of the invention can be incorporated in a number of different ways and can be arranged as a permanent attachment to a particular bed, but it is preferred to embody it as shown in FIGURE 1 for use with a regular bed **6** having a bedstead **7** including a frame and support member **8** on which the customary mattress **9** is disposed for use by a patient **11** lying in the bed.

Included in the traction device is an upright support yoke **13**. This conveniently is a substantially closed loop of metal tubing having rounded corners and lying generally in an erect or upright position.

In order to secure the yoke in the appropriate upright position, there is also provided a base member **14** which is a partially closed loop of metal tubing having side arms **16** and **17** designed to extend longitudinally of the bed and having a cross bar **18** joining the side arms **16** and

17. The base member is variably attached to the upright yoke **13**. Encircling each of the side bars **19** and **21** of the yoke **13** are friction clamps **22**, as particularly illustrated in FIGURE 5. Each clamp includes a pair of slightly spaced springy side plates **23** and **24**. The side plates are preferably perforated with noncircular apertures to receive a carriage bolt **26**. When a wing nut **27** on the bolt **26** is tightened, the side plates **23** and **24** are approached and effectuate a tight clamping action of the member **22** at any vertical location along the yoke **13**.

The base member **14** is contoured to provide terminal tabs **28**, each of which is pierced by a preferably circular aperture through which the bolt **26** is readily received. The terminal tab **28** and the plates **23** and **24** provide a packet which can be frictionally gripped together by the tightening of the wing nut **27**. When the wing nut is slacked off, there is sufficient springiness in the plates **23** and **24** to allow freedom for pivotal motion between the terminal tab **28** and the plates **23** and **24**. If the wing nut **27** is completely removed and the carriage bolt **26** is withdrawn, then the base member **14** and the yoke **13** can be completely disassembled. The relative pivotal movement between the base member and the yoke is useful in that, as shown in FIGURE 4, the parts can be compactly arranged for storage and can easily be put substantially in perpendicular relationship for use. Furthermore, the yoke **13** can be moved up and down to any desired location when the nuts **27** are loose so that, after tightening, the yoke **13** can be held at any desired height above the bed frame **8**. The base member **14**, being disposed between portions of the bed frame **8** and the mattress **9**, is thereby held in position. The weight of the patient also adds to the force holding the base frame in proper location so that in most instances no additional fastening or securing means is required. The base frame can readily be inserted into and withdrawn from position to adapt any bed to the use of the traction device.

Extending transversely between the side members **19** and **21** adjacent the upper end of the yoke **13** is a differential drum **36**. This is a structure containing axle ends **37** and **38** well journalled in appropriate sockets **39** in the yoke **13**. The differential drum is thus mounted for rotation about a transverse axis **41**. The drum itself is inclusive of a central small diameter portion **42** and a pair of side portions **43** and **44** which are of larger diameter and are substantially symmetrical. At each end the large portions **43** and **44** have hubs **46** and **47** and at the junction of the larger ends with the smaller central portion there are conical portions **48** and **49**.

Passing through appropriate passages **51** and **52** near the ends of the central portion are the enlarged terminals **53** and **54** of a primary cable **56**. This is a flexible member preferably of nylon or even stainless steel or any material readily compatible with the material of the differential drum. Being fastened at its ends, the cable **56** is wound oppositely and symmetrically around the central portion of the drum to provide a central loop **57**. Engaging the primary cable in the loop portion **57** thereof is a cable-engaging device **58** such as a low-friction pulley. This is mounted for rotation in a clip **59** secured by a through bolt **61** to a spreader bar **62**. The spreader bar is symmetrically disposed and is of readily breakable material. At its opposite ends it is provided with hooks **63** and **64** to which any suitable sort of traction yoke **66** can be secured. In the present instance the yoke **66** is a head halter of the configuration shown and adapted to be worn by the patient **11**.

To impose a traction force, the ends **67** and **68** of a secondary cable are wound around each of the larger end portions **43** and **44**, being passed through appropriate

openings **69** in the differential drum and provided with anchors **71**. The secondary cable provides a fastening loop **72** supporting a soft, open-top container **73** for one or more relatively thin weights **74**. The container and weights move vertically in the general plane of the yoke **13**. The weights are made quite thin so that the amount of space occupied by the traction device is readily available between the mattress end and the upright frame of an ordinary bed. The number of weights is varied to afford the desired traction force. The amount of weight is roughly half what it would otherwise have to be were not force multiplication attained by the difference in diameters of the larger secondary portions of the differential drum and the smaller primary portions thereof.

As shown in FIGURE 6, the support yoke can be modified for vertical adjustment. Instead of being continuous, each of the side bars is made up of telescoping members **76** and **77**. One of the members is provided with numerous perforations **78** to receive a lock pin **79** also passing through a suitable opening in the other member. The height of the top of the yoke can be set and held at any elevation selected.

In use, the weight of the patient assists in holding the mechanism in place while the weight continues to exert proper force upon the head halter. The angle at which the force is imposed is adjustable by moving the yoke **13** vertically in the clamps **22** or by setting the pins **79** to hold the desired vertical relationship or both. In the event of emergency, the patient can detach himself from the device because the spreader bar is readily breakable. Prior to that time and in general use, a considerable degree of freedom is available.

What is claimed is:

1. A therapeutic traction device comprising an upright support yoke, means engaging said support yoke for positioning said support yoke with respect to a bed, a differential drum having a central portion of one predetermined diameter and a pair of end portions of another predetermined different diameter, means for pivoting said differential drum in said support yoke for rotation with respect thereto, a spreader bar, means including a primary cable for connecting said spreader bar and said differential drum, means constituting connections between the two ends of said primary cable and one of said central portion or said end portions of said drum, means constituting a connection between the central portion of said primary cable and the central portion of said spreader bar, a weight, means including a secondary cable for connecting said weight and said differential drum, means constituting connections between the two ends of said secondary cable and the other of said end portions of said drum or said central portion, and means constituting a connection between the central portion of said secondary cable and said weight.

2. A device as in claim **1** in which said primary and secondary cables at their ends extend through passages in said differential drum.

3. A therapeutic traction device for use with a bed having a frame and on which a patient lies comprising an upright support yoke, a base member adapted to rest on said frame beneath said patient, means for mounting said support yoke on said base member to extend thereabove, a differential drum pivoted in said support yoke and having a central portion of small diameter and end portions of large diameter, a primary cable secured to said central portion at both ends and extending from said drum to form a loop, a spreader bar, a cable engaging device on said spreader bar and engaging said primary cable in said loop, a traction halter secured to said spreader bar, a secondary cable secured to said end portions and depending therefrom, and a weight secured to said depending secondary cable.

4. A device as in claim **1** in which said weight is enclosed in a container having an opening to admit of the passage of said weight.

5. A device as in claim **1** in which said support yoke and said base member are interconnected by adjustable friction devices.

References Cited by the Examiner

UNITED STATES PATENTS

806,401	1/1905	Dawson	254—184
2,714,885	8/1955	Uhland	128—75
2,808,051	10/1957	Martin	128—84.4
2,830,581	4/1958	Sanders	128—75
2,909,175	10/1959	Kinnear	128—84
3,009,461	11/1961	Collins	128—75 X
3,060,929	10/1962	Zivi	128—75
3,063,445	11/1962	Ries	128—75
3,085,768	4/1963	Treutelaar	128—75
3,086,519	4/1963	Pari	128—75
3,117,572	1/1964	Wright	128—75

FOREIGN PATENTS

570,228	4/1924	France.

RICHARD A. GAUDET, *Primary Examiner.*

J. W. HINEY, JR., *Assistant Examiner.*