

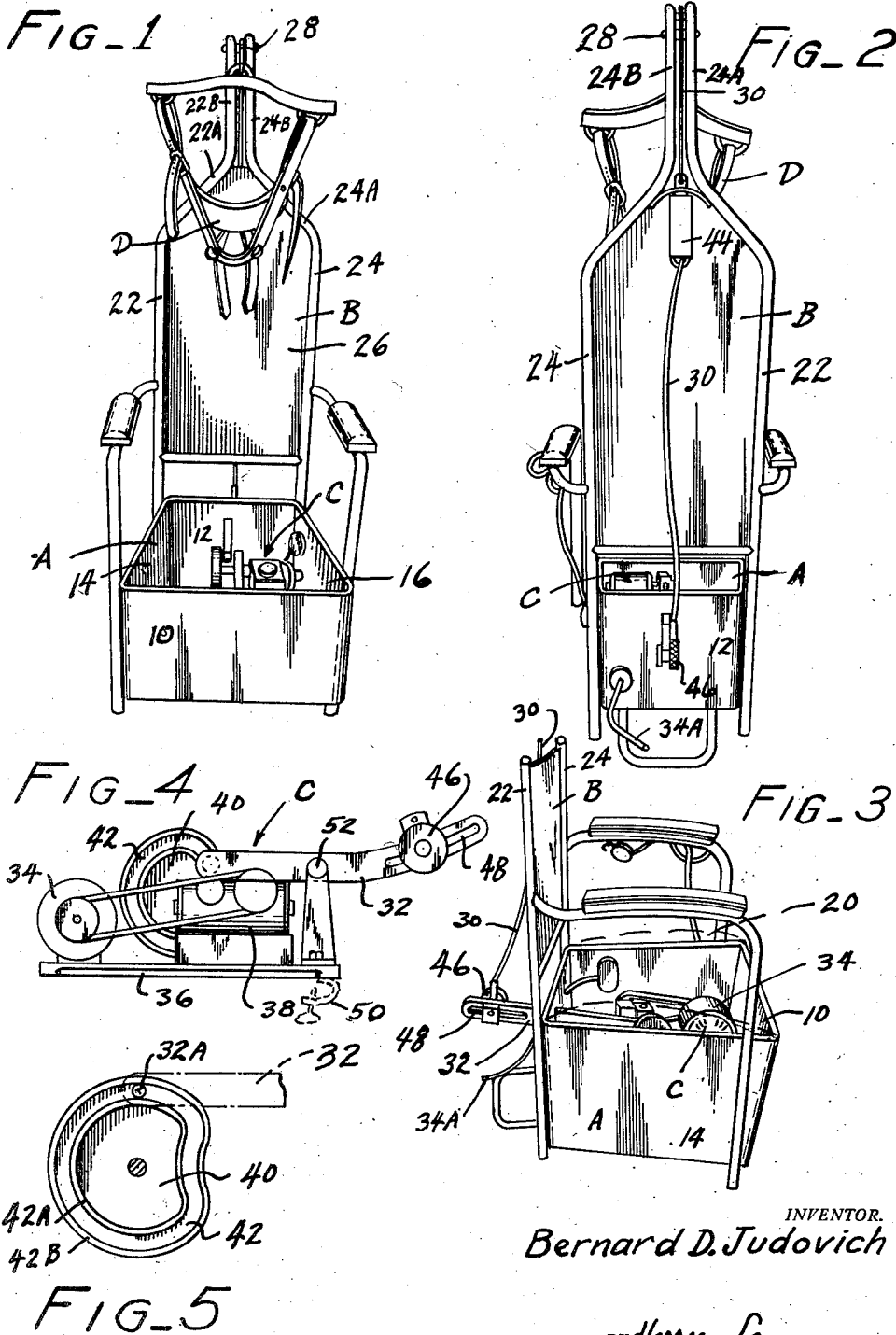
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INTERMITTENT TRACTION MACHINE

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INTERMITTENT TRACTION MACHINE

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1 Claim. (Cl. 128—75)

My invention relates to the treatment of injuries to the spine and relates particularly to a machine for applying motorized intermittent traction to the cervical or the lumbar spine.

Prior art devices have applied intermittent traction to the spine but the machines have not always provided the necessary stamina and simplicity desired. Furthermore, the chair wherein the apparatus is housed has not been comfortable and all of the machine or actuating part have been relatively noisy.

It, therefore, is an object of my invention to provide a traction machine which is safe in operation and which will not result in harm to the patient in the event any part fails or breaks.

Another object of my invention is to provide a chair for housing the actuating equipment for intermittent traction equipment which is comfortable for the patient.

Another object of my invention is to provide an intermittent traction machine wherein sudden jarring of the patient will be eliminated.

Another object of my invention is to provide a traction machine wherein the actuating equipment is retained within a sound reducing container.

Other objects of my invention are to provide an improved device of the character described, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, my invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Fig. 1 is a front view of intermittent traction chair embodying my invention.

Fig. 2 is a rear view of the chair shown in Fig. 1.

Fig. 3 is a side view of the chair.

Fig. 4 is a side view of the motor, gear reducing apparatus, and cam and its complementary lever.

Fig. 5 is a view of the cam and its complementary lever (shown in dotted lines).

Referring now in detail to the drawing wherein similar characters refer to similar parts, I show an intermittent traction chair comprising a casing, generally designated as A, which serves as a seat for the patient and an enclosure for the actuating mechanism; a back, generally designated as B, and motorized traction apparatus, generally designated as C.

The casing A has a bottom and a front 10, a back 12, and two joining sides 14, 16 to form substantially a container for the mechanism and a support for a seat 20.

The back B utilizes vertical spaced side rods or tubes 22, 24 to support a back rest sheet 26.

The vertical rods 22, 24 taper upwardly at 22A, 24A, respectively, and then become closely spaced from one another as at 22B, 24B to serve as pulley supporting rods for a pulley 28.

A neck halter, generally designated as D, is attached

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to a cable 30 that is carried over the pulley 28 to one end of a lever 32.

The actuating mechanism C located within the casing A includes a motor 34 secured to a base 36, a gear reduction mechanism 38 for reducing the speed of the motor 34, and a cardioid shaped cam 40 attached to the gear reduction mechanism. The power to the motor 34 is carried by a cord 34A.

The arm 32 has a follower wheel 32A attached to one side thereof so that it rides within the cardioid shaped cam groove 42 in the cam 40. In this manner the lever arm 32 is pulled up and down in timed relationship so that the cord 30 on the halter D is pulled up and down intermittently.

In the application of motorized intermittent traction, either to the cervical or lumbar spine, the force and degree and smoothness of the pull is exerted by the cam-arm, the motion of which is regulated by the shape of the cardioid cam 40, the cam-arm riding the perimeter, or squared off outer edge 42A, 42B of the cam groove or cardioid shaped channel 42 on a roller bearing 52A. If the follower 32A should slip to one side or in any other way lose its contact with the flat surface of the cam edge, harm or certainly discomfort will be experienced by the patient due to sudden jarring of the cervical spine, especially if it happens to slip while the maximum force is being exerted, or if the bearing roller on the cam-arm should change angles, undue stress and wear is placed upon one side of the bearing and the cam edge. With the prior art type of cam, the cam arm becomes slack, as the cam rotates and the pull returns to zero. Hence, with no pull exerted upon the arm of the prior art, it was necessary to use a spring to pull the cam-arm down in order to exert sufficient force so that the cam-following bearing will always have firm contact with the edge of the cam surface.

The above problems presented objections and possibilities of damage, harm, and discomfort, and have been eliminated by my new cam, which not only makes slipping of the bearing impossible, but eliminates the necessity for using a spring to hold the cam arm to the cam surface. This cam has sufficient thickness at its periphery that it will allow a recessed box, or channel 42 for the bearing to be milled out. The bearing, with a heavy steel spindle, is inserted into the channel 42 and fastened to the cam-arm. As a result, in a properly milled cam, the bearing of the follower rides the surfaces squarely, produces no side sway, no slippage, and it eliminates completely the need for a spring to hold down the cam-arm. It ensures that no harm or discomfort will come to patients because of a slipped bearing during operation of the traction apparatus. The bearing 32A, when properly inserted into the raceway 42 cannot come out. Arranging the cam so that the raceway faces the output shaft 32 makes the unit more compact, and easier to center the cam-arm slot within a small enclosure.

The motor used is a slower speed motor and has a lower gear speed ratio than that formerly used, which results in less noise and less wear.

Doing away with upright channel, the chair frame instead sweeps upward to form the overhead support. A guard rail keeps the moving cam-arm away from the wall, or from contacting other objects.

The front seat wall 10 has the front cut back from above downwardly to nestle the heels of the patient and thereby insure greater comfort.

The cord 30 has a spring 44 intermediate its ends with one end connected to a clamp 46 which is adjustable along a slot 48 in the pivoted lever 32, which is pivoted at 52.

The casing A is lined with sound absorbing material. In addition, a new traction box for bed patients has

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been developed which contains this new mechanism. Instead of the old method of a large box being placed under the bed, this apparatus is much smaller and is hung on the bed with adjustable clamps which are part of the unit. The moving cam-arm with a cross bar is attached directly to a head halter for traction without the necessary pulley which is always used in conventional traction, and also in motorized intermittent traction.

As a modification of application of my invention, I take the unit illustrated in Fig. 4 and mount it upon the vertical back rail of a bed. I place a plurality of hooks 50 (shown in dotted lines in Fig. 4) and mount the hooks and the base 36 on a horizontal bar of the bed, the cable 30 is shortened but the scale remains and the halter F is attached to the head and neck of the patient as he lies in bed so that the arm 32 pulls on the cable 30 in its shortened position. The machine operates to afford traction to the patient as he lies in bed and an off-on electric switch (not shown) is placed in the hand of the patient so that he can turn the motor on or off.

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Although my invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

I claim as my invention:

A traction machine having a back rest, a plurality of side rods adjacent said back rest, a pulley, said side rods tapering their uppermost portion to retain said pulley, a cable mounted upon said pulley, a head halter attached to one end of said cable, a lever, one end of said lever holding the other end of said cable, a cardioid shaped cam having a recess therein to follow the shape of cardioid, and a follower on said lever interfitting with said cam recess.

References Cited in the file of this patent

UNITED STATES PATENTS

2,633,125 Yellin ----- Mar. 31, 1953