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THERAPEUTIC ARTICULATING APPARATUS

Filed Oct. 11, 1929

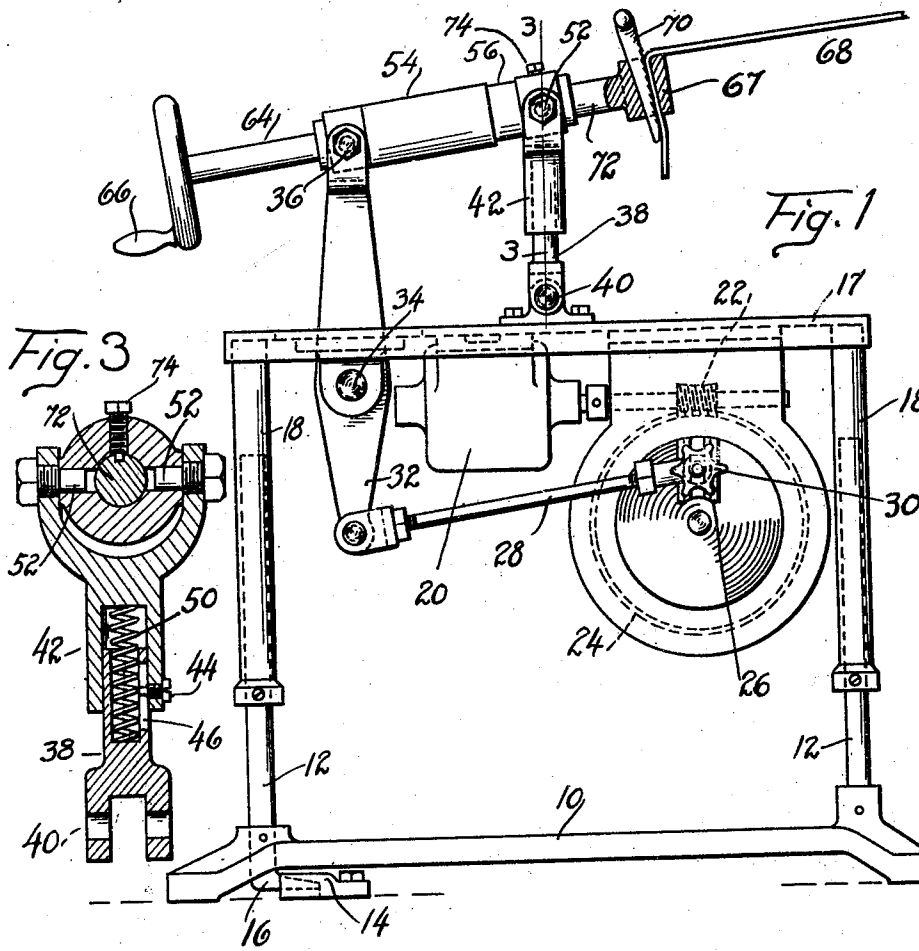

Fig. 1

Fig. 3

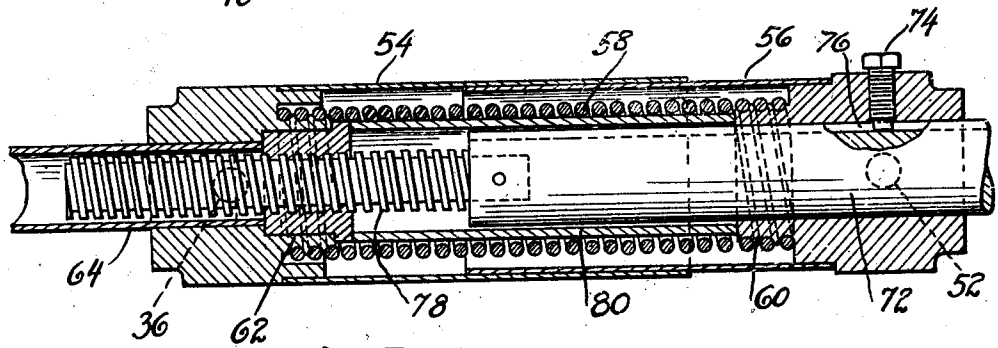

Fig. 2

INVENTORS
Paul Henze and
Gustaf S. Gillberg
BY
Parker & Burton
ATTORNEYS

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UNITED STATES PATENT OFFICE

PAUL HENZE AND GUSTAF S. GILLBERG, OF DETROIT, MICHIGAN, ASSIGNORS TO ELECTRO-MOTIVE INSTRUMENT CO., OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

THERAPEUTIC ARTICULATING APPARATUS

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This invention relates to a therapeutic articulating mechanism adapted for employment in hospitals or by physicians to mechanically manipulate certain affected parts of the body of the patient such as the arms or legs to loosen up the muscles or ligaments by drawing and working same through the operation of the apparatus.

Our improved apparatus is designed to place a predetermined load, which may be adjusted as desired, upon various joints of the human body and employs different types of harness arrangement to engage the body, and the apparatus is of such a character that it will yield if the resistance of the muscles or joint ligaments of the patient is unduly great, thereby preventing any injury thereto.

The articulating apparatus is arranged to produce a yielding rhythmic motion and to continuously repeat it and is so constructed that this may be varied in different ways. A desirable feature resides in the embodiment of a structure of this type in a few simple, strong, sturdy parts so connected that the stroke or extent of movement or the direction thereof may be readily varied and the position of the harness attachment may be quickly changed.

Other objects, advantages and meritorious features of our invention will more fully appear from the following description, appended claims, and accompanying drawing, wherein

Fig. 1 is an elevation of the apparatus embodying our invention.

Fig. 2 is a longitudinally sectional view through the spring tension connection, and

Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 1.

Our apparatus comprises a floor frame 10 which may preferably be rectangular in shape provided with upright standards 12 at each of the four corners and an attaching plate 14 may be secured to the floor and engaged with a foot 16 formed on one or more of said standards to secure the apparatus rigidly to the floor.

There is a platform or superior frame structure 17 which is provided with depending tubular standards 18 arranged one at each corner and telescoping over the standards 12 of the floor frame 10 and adapted to be adjusted and supported at different heights.

This platform carries power mechanism in the form of an electric motor 20 which drives a worm 22 which, in turn, drives a gear 24, which gear has a radial guideway 26 within which is slidably adjustably supported to one end of a pitman rod 28, an adjustment 30 being provided to change the position of the connection of the rod with the gear. The other end of the rod 28 is connected to the lower end of a rock lever 32 which is pivotally mounted at 34 upon the platform which is provided with trunnions 36 at its upper end.

A swinging standard is pivotally supported upon the platform and comprises a lower portion 38 pivotally supported at 40 for swinging movement in the same direction as the rock lever and an upper portion 42 telescoped over the lower portion and slidably adjustable as to height. A set screw 44 is carried by the portion 42 and travels through a slot 46 in the portion 38 and a spring 50 is interposed between these two portions tending to hold them apart.

Member 42 is provided at its upper end with trunnions 52 similar to the trunnions 36 provided at the upper end of the member 32.

A telescoping spring tension driving connection bridges the upper ends of the rock lever 32 and the swinging standard 42 and is illustrated in longitudinal cross-section in Fig. 2. It comprises telescoping members 54 and 56. Member 56 is pivotally supported upon the trunnions 52 and member 54 is pivotally supported upon the trunnions 36 and said members are held apart by a tension spring 58 which is connected with member 56 by being threaded on to a shank portion 60 thereof and which is connected to member 54 by being threaded on to its shank portion. A rotatable nut 62 carries a tubular extension 64, the outer end of which is provided with a crank 66. The nut 62 is freely mounted within the end portion of the member 54 for rotation therein.

There is a harness support or attachment

67 to which a harness member 68 may be connected and held in place by a wedge 70: This harness support has a shank member 72 which extends slidably through the telescoping members for longitudinal adjustment but is held against rotation by a set screw 74 which rides in a slot 76 formed therein. This shank has a threaded portion 78 which is engaged by the rotatable nut 62, which nut is held against advancement by a spacing member 80 so that upon rotation of the nut the harness attachment is advanced or retracted with respect to the telescoping members.

What we claim is:

1. Therapeutic articulating apparatus comprising a frame, power mechanism carried by and depending below the frame, a rock lever pivotally mounted upon the frame and extending above and below the same, a driving connection between the lower end of the rock lever and said power mechanism, a swinging standard pivoted at one end to the frame, a telescoping driving spring tension connection between the upper end of the rock lever and the free end of the swinging standard and a harness support carried by and longitudinally adjustable through said telescoping spring tension connection.

2. Therapeutic articulating apparatus comprising a frame, a rock lever pivotally mounted upon the frame, power mechanism connected with one end of the rock lever to rock said lever, a swinging standard pivotally mounted upon the frame, a spring tension driving connection between the free end of the rock lever and the free end of the swinging standard to swing said standard, and a harness support carried by and extending adjustably through said spring tension connection, and means for longitudinally adjusting the same therethrough.

3. Therapeutic articulating apparatus comprising a frame, a rock lever pivotally mounted upon the frame, power mechanism connected with one end of the rock lever to rock said lever, a swinging standard pivotally mounted upon the frame, a telescoping spring tension driving connection pivoted at one end to the free end of the swinging standard and pivoted at the other end to the free end of the rock lever, and a harness support extending adjustably through said driving connection.

4. Therapeutic articulating apparatus comprising a frame, a rock lever pivotally mounted upon the frame, power mechanism connected with one end of the rock lever to rock said lever, a swinging standard pivotally mounted upon the frame, a telescoping spring tension driving connection having one telescoping member trunnioned on the free end of the rock lever and the other telescoping member trunnioned on the free end of the swinging standard and a tension spring enclosed by and connecting said members, and a harness support carried by and having a part extending adjustably through said telescoping members, and rotatable means engaging said part to advance or retract the harness support adjustably with respect to said telescoping members.

5. Therapeutic articulating apparatus comprising a frame, a rock lever pivotally mounted upon the frame, power mechanism connected with one end of the rock lever to rock said lever, a swinging standard pivotally mounted upon the frame, a telescoping spring tension driving connection having one telescoping member trunnioned on the free end of the rock lever and the other telescoping member trunnioned on the free end of the swinging standard and a tension spring enclosed by and connecting said members, a harness support having an attaching head and a shank extending slidably through said telescoping members for longitudinal non-rotatable adjustment, said shank provided with a screw threaded portion and a manually rotatable part threadedly engaging said screw threaded portion of the shank to adjustably advance and retract the same with respect to the telescoping members.

In testimony whereof, we, PAUL HENZE and GUSTAF S. GILLBERG, sign this specification.

PAUL HENZE.
GUSTAF S. GILLBERG.