Sept. 30, 1947. W. A. LEA 2,428,285

VIBRATION ISOLATOR

Filed March 11, 1946

FIG. 1.

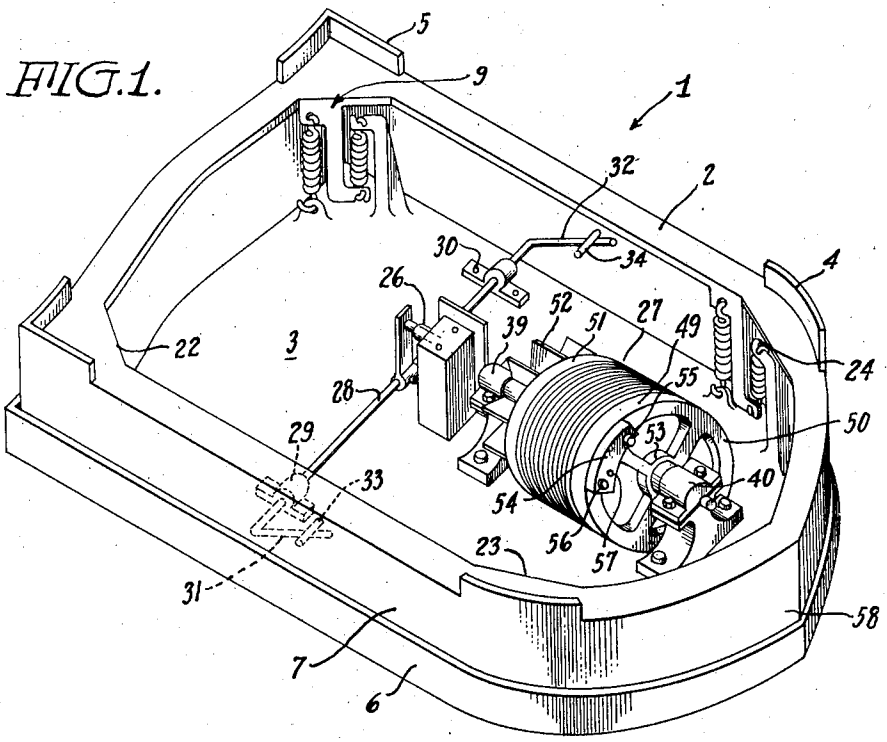
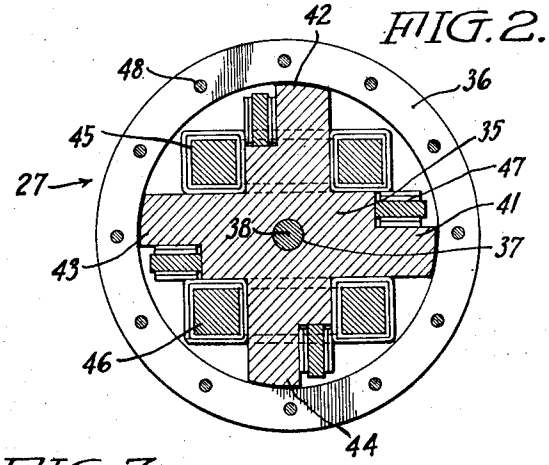


FIG. 2.



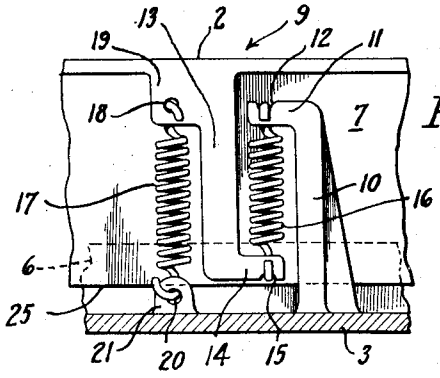


FIG. 3.

INVENTOR

WALTER ALEXANDER LEA

BY W. E. Beatty

ATTORNEY

Patented Sept. 30, 1947

2,428,285

UNITED STATES PATENT OFFICE

2,428,285

VIBRATION ISOLATOR

Walter Alexander Lea, Los Angeles, Calif., assignor to Frank H. Newton, Los Angeles, Calif.

Application March 11, 1946, Serial No. 653,544

3 Claims. (Cl. 248—358)

1

The invention relates to a therapeutic vibrator and to a method of assembling the vibrator and has for an object to provide an improved and simplified type of motor and eccentric for producing the vibration as well as an improved full floating resilient support for the vibrating platform, and an improved method of assembling the full floating platform on its base.

For further details of the invention reference may be made to the drawing wherein

Fig. 1 is a perspective view of a therapeutic vibrator according to the present invention, shown in an upsidedown position.

Fig. 2 is an enlarged sectional view of the motor of Fig. 1.

Fig. 3 is a view in elevation, partly in section and with parts broken away, showing one of the full floating spring suspensions of Fig. 1, Fig. 3 showing the device upsidedown.

Referring in detail to the drawings, the vibrator 1 of this invention comprises a base 2 having thereon a full-floating vibratory platform 3, the device being shown upsidedown to illustrate the working parts. The base 2 is in the form of a frame open at its top and bottom and having a plurality of spaced feet as indicated at 4 and 5, and the platform 3 which is adapted to support the patient, covers the top of the frame and has a depending flange 6 which extends over the vertical side wall 7 of the frame 2.

The platform 3 has a full floating resilient support on the base 2 and for this purpose there are provided a plurality of sets, here illustrated as four, spring suspensions, all alike, and one of which is indicated at 9 and shown enlarged in Fig. 3. As shown in Fig. 3, the platform 3 has an upright elongated lug 10 having a cross arm 11 adjacent the bottom of side wall 7 and provided with a spring retaining notch 12 and the base 2 has an elongated upright lug 13 having a cross arm 14 adjacent the top of side wall 7 and provided with a spring retaining notch 15. The lugs 10 and 13 are about as long as the height of the side wall 7 and are arranged inside of the side wall 7. A helical coil spring 16 has its opposite ends engaged in the spring hangers or notches 12 and 15. The spring 16 is an upwardly pulling tension spring and tends to separate the platform 3 from the base 2. This tendency is counterbalanced by a parallel downwardly pulling helical tension spring 17 having one end thereof connected in a spring hanger 18 in a short lug 19 on base 2, and its other end engaged in a spring hanger 20 in a short lug 21 on the platform 3.

2

The other four sets of spring suspensions like that shown in Fig. 3 are provided at substantially the four corners of the device 1, as indicated at 9, 22, 23 and 24.

The tension of the springs 16 and 17 is such that the weight of an average adult on platform 3 is not sufficient to force this platform to the top 25 of the base 2, while the patient by pushing down on the platform 3 can depress it enough to operate the switch 26 for the motor 27. Switch 26 has a switch arm 28 which rocks in bearings 29 and 30 on the underside of the platform 3. The switch arm 28 at its opposite ends has extensions 31 and 32 which bear against stops 33 and 34, respectively, on the opposite sides 7 of the frame 2. When the platform 3 is tilted by stepping on either side or pushed towards the base 2, the switch rod 28 is rocked to close switch 26 and connect a source of alternating current, not shown, to the motor 27.

Motor 27 is adapted to be operated by the standard 110 volt, 60 cycle, single phase current, commonly used for house lighting circuits. Motor 27 is a self-starting induction type motor but is not of the ordinary type in that the stator 35 as shown in Fig. 2, is an internal member and is surrounded by a rotor 36 in the form of a cylindrical shell comprising an iron clad squirrel cage rotor.

The stator 35 has a central aperture 37 through which passes an axle 38 which is supported by and held stationary in the supports 39 and 40. The stator 35 has a driven fit on or is suitably fixed to the stationary axle 38.

The stator 35 has four polar projections indicated at 41—44. Around pole 42 is a field winding 45 and around pole 44 is a field winding 46. These two windings 45, 46 magnetize the four poles. The field windings 45, 46 may be connected in series together and with the A. C. supply. Each pole 41—44 is provided with a shading coil short-circuited on itself, the shading coil for pole 41 being indicated at 47 and the other three poles 42—44 having a similarly positioned and arranged short-circuited shading coil. The shading coils like 47 remain short-circuited and their connections are not changed during the starting and running of the motor.

The rotor 27 is made up of a series of laminations of magnetic material having embedded therein a squirrel cage of which one of the bars is indicated at 48. The opposite ends of the bars like 48 are suitably short-circuited for example by a cast lead ring 49 between the end of the rotor 27 and each end plate 50, 51. End plate 51

may have a series of fan blades **52** to ventilate the stator **35** and rotor **36** through the openings between the spaced feet such as **4** and **5** underneath the bottom of the imperforate surrounding side wall **7**. End plate **50** carries a bearing **53** and end plate **51** has a similar bearing, not shown, to rotatably support the rotor **27** on the axle **38**.

To cause the platform **3** to vibrate, there is attached to one end plate such as **50** an arcuate weight **54** which serves as an eccentric.

The amount of vibration may be adjusted by varying the radial position or amount of the weight **54**. Its position may be varied by supporting it on one end by a pivot **55** and by securing the other end thereof to the end plate **50** by means of a screw **56** at a certain distance from the rotor axis, or by fastening screw **56** in another hole **57** which is at a different distance from the rotor axis.

Preferably the motor **27** is positioned with its axis extending lengthwise of the middle of platform **3** with the eccentric **54** facing and adjacent the front end **58** of the platform.

In order to assemble the spring suspension, the base **2** is placed on top of the platform **3** as shown in Figs. 1 and 3, with the platform **3** farther away from base **2** than its normal floating position, and the springs like **16** are inserted through the open bottom of frame **2** one at a time and positioned in notches like **12** and **15**, with springs **16** under little or no tension. Then the base and platform are placed in a jig and pressure is applied to urge platform **3** closer to base **2** than its normal floating position, thereby stretching springs **16** to bring spring hangers **18** and **20** close enough together so that springs like **17** can be inserted through the open bottom of base **2** and mounted with little or no tension on the hangers like **18** and **20**. Then the jig and pressure are removed and the platform **3** floats on the four sets of springs like **16** and **17**, which then exert their normal opposed tensions. Springs like **16** are more powerful than the springs like **17**, because the springs like **16** not only must overcome the tension of springs like **17** but also the weight of an adult person or whatever portion of his body is supported by the platform **3**.

It will be apparent that various modifications may be made in the invention without departing from the spirit of the following claims.

I claim:

1. A therapeutic vibrator comprising a vibratory platform, a base therefor comprising a frame open at the top and bottom and having a vertical side wall, a plurality of spaced base lugs extending upwardly from and inside of said side wall, each of said base lugs having an upright portion having at one side thereof a (first) spring hanger adjacent the bottom of said base and having at

the other side thereof a cross arm having a (second) spring hanger adjacent the top of said wall, said platform having depending therefrom a similar pair of lugs for each of said base lugs, one member of each of said pairs being short and having a (third) spring hanger above one of said first spring hangers, the other member of each of said pairs having an elongated pendant portion having a cross arm having a (fourth) spring hanger adjacent the bottom of said wall below one of said second spring hangers, a set of downwardly pulling tension springs each connected at one end to one of said first spring hangers and at its other end to its companion third spring hanger, and a set of upwardly pulling tension springs each connected at one end to one of said second spring hangers and at its other end to its companion fourth spring hanger.

2. A therapeutic device comprising a base having a surrounding side wall, said base having an open top and having a bottom having an enlarged opening therein, a vibratory platform covering said top, a full floating spring suspension for said platform inside of said side wall, said suspension comprising a set of helical tension springs urging said platform to said base, and a second set of helical tension springs urging said platform away from said base, a group of short and long spring hangers on said base and a companion group of short and long spring hangers on said platform supporting said springs laterally spaced apart around said wall, with a short hanger of each group for a spring of said first set and a long hanger of each group for a spring of said second set, said opening in said base providing access to all of said springs.

3. A therapeutic device comprising a base frame having a surrounding side wall having an opening at the top and bottom thereof, a vibratory platform covering said top, and a full floating spring suspension for said platform inside of said side wall, said suspension comprising a plurality of pairs of tension springs connected to said base and to said platform in opposed relation.

WALTER ALEXANDER LEA.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,234,770	Meyer	Apr. 11, 1941
1,845,941	Stevens et al.	Feb. 16, 1932
2,235,158	Krenzke	Mar. 18, 1941
2,235,183	Wettlaufer	Mar. 18, 1941
2,368,727	Robinson	Feb. 6, 1945
653,906	Brown	July 17, 1900