

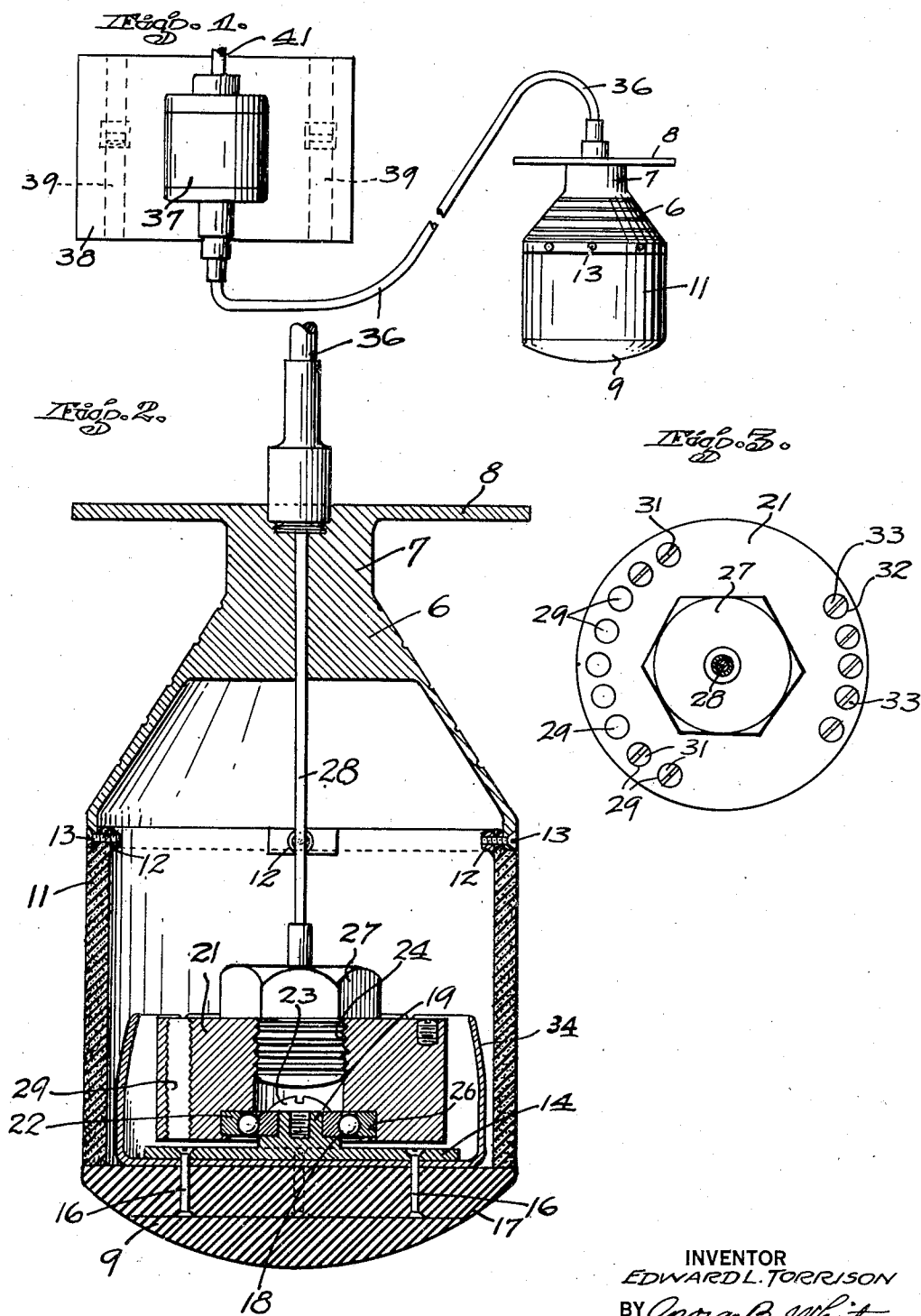
Sept. 26, 1939.

E. L. TORRISON

2,174,452

VIBRATORY PRESSURE DEVICE

Filed Nov. 27, 1935



INVENTOR
EDWARD L. TORRISON
BY *George B. White*
ATTORNEY

UNITED STATES PATENT OFFICE

2,174,452

VIBRATORY PRESSURE DEVICE

Edward L. Torrison, San Francisco, Calif.

Application November 27, 1935, Serial No. 51,857

12 Claims. (Cl. 128—36)

This invention relates to a device for producing vibratory pressure.

The primary object of the invention is to provide a method for the artificial simulation of the massaging movement of the hand in the presence of vibratory action for the treatment of a part of the human body.

Another object of the invention is to provide a device whereby a flexible directional vibratory pressure is created to take the place of hand or palm manipulation by masseurs, osteopaths, chiropractors, electrotherapists, and physical therapists and the like.

Another object of this invention is to provide a method and device for producing vibratory pressure which is highly useful and simple in construction. Convenience of arrangement, lightness and comparative inexpense of manufacture are further objects which have been borne in mind in the production and development of the invention.

I am aware that some changes may be made in the general arrangements and combinations of the several devices and parts, as well as in the details of the construction thereof without departing from the scope of the present invention as set forth in the following specification, and as defined in the following claims; hence I do not limit my invention to the exact arrangements and combinations of the said device and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawing.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawing for the illustrative embodiment of the invention, wherein:

Figure 1 is a side view of my complete device.

Figure 2 is a sectional view of the pressure vibratory part of the device, and

Figure 3 is a detail top plan view of the rotor of my device.

Heretofore in physical culture, osteopathy, electrotherapy and physical therapy and the like, massaging action was accomplished by hand. Massaging pressure is usually exerted by the rounded ball of the palm of the hand as the operator presses his hand and rubs the part of the body of a patient under treatment. There were certain devices used in past for vibration, usually employing rotating rubber cups, which, however did not exert any appreciable pressure,

nor any deep vibration, but merely a limited oscillatory movement.

In my method the massaging action of the human hand is simulated in the presence of vibratory movement.

The method consists in the manipulation of an artificial massaging member on a body to be treated so that a directional pressure is exerted on said member, and the imparting of preferably circular vibration to said member. The massaging member is preferably so formed as to simulate the shape of the ball of the human hand. Said vibration is imparted not manually but artificially, such as by means of the pull of a shifting rotary mass on said member. It is to be noted that in my method the massaging member is simultaneously subjected to the flexible pressure manipulation, and to an independent circular shifting pull to produce the desired vibratory pressure. The flexibility of the directional pressure is accomplished by interposing a flexible and compressible member between the massaging member and the manipulator. In other words a resilient and flexible pressure is exerted on the massaging member and on the human body, and in addition an independent shifting vibratory action is imparted to the massaging member. The vibratory action is preferably created by a freely rotated shiftable mass which has both linear and angular velocity to create a circular rubbing motion by reason of its shifting around so that the center of the mass moves on a substantially circular path. To this compound vibratory pressure may be added when desired a vibratory action at an angle to the plane of said massaging member for harder and deeper vibration.

By the above method not only the natural manual massage is simulated, but the massage is augmented by vibration, which in experience proved to be of great benefit not attainable by mere manual massaging, nor by the usual manual or mechanical pounding or vibration.

My device includes a handle 6 which is preferably of upwardly tapering frusto-conical shape and is serrated on its outer periphery to provide a convenient hand grip. Near its upper end the handle 6 has a cylindrical neck 7 which terminates in a circular disk 8 whereby the device is readily hung on top of the closed fist of the operator as the palm grips the handle 6.

A pad 9, preferably made of comparatively hard rubber or the like, is supported on the handle 6 by means of a resiliently compressible and flexible hollow support 11. The pad 9 is

of a spherical segment shape and is so arranged that its lower face simulates the ball of a human hand, but its upper face is flat and circular. The hollow support 11 is cylindrical and is made of sponge rubber or the like, and is detachably secured to the handle 6 at reinforced points 12 by means of screws 13, and fixed or vulcanized to the pad 9. The pad 9, the hollow support 11 and the base of the handle 6 are of the same outer diameter.

When the pad 9 is applied to the part of the body under treatment any desired pressure may be applied by exerting pressure on the pad 9 through the flexible support 11. By rocking, shifting, and twisting the handle 6 as the same is pressed upon the body the support 11 is resiliently compressed and twisted and the pad 9 is rocked and shifted and moved with a rubbing motion. The rate of motion of the pad 9 due to such manipulation is dependent on the pressure exerted thereon. In other words the firmer the frictional contact is between the pad 9 and the body treated the more the support 11 is twisted and flexed before the pad can be shifted. The pressure and motion is not transmitted directly from the hand of the operator or from the handle 6 but through the cushioning action of the support 11 resulting in well modulated massaging action.

To the pad 9 is suitably fixed a journal plate 14. In the herein illustration the plate 14 is secured to the flat face of the pad 9 by means of rivets 15 which extend through an upper layer 17 of the pad 9. The lower segment-like layer of the pad 9 is then integrally united with said upper layer so as to completely cover the rivets 16 and prevent the same to interfere with the smooth action of the pad 9. From a central boss 18 of the plate 14 extends a short journal 19 of smaller diameter than that of the boss 18. On the journal 19 is journaled a rotatable mass or body in the form of a preferably cylindrical rotor 21, by means of a ball bearing 22. The inner race of the ball bearing 22 rests upon the boss 18 and is held on the journal 19 by the head of a clamping screw 23, which latter is disposed within a central bore 24 of the rotor 21. The outer race of the ball bearing 22 is held in a central recess 26 in the bottom of the rotor 21. The outer edges of the recess 26 are hammered or crimped over the edge of the lower face of the outer race of the ball bearing 22 to hold the latter in place. It is to be noted that the boss 18 is of the same or smaller diameter than the diameter of the inner race of the ball bearing 22 so as not to interfere with the rotation of the outer race of said ball bearing 22.

The upper end of the central bore 24 is threaded to suitably engage a driving bolt 27 to which latter is connected a flexible drive shaft 28 to transmit rotary motion to the bolt 27 and to the rotor 21. In order to achieve circular and lateral shifting of the rotor 21 the same is unbalanced so that its center of gravity is to one side of its center of rotation. Due to the flexible drive and to the flexible mounting of the pad 9 the rotor 21 is allowed to shift around a plurality of continuous centers of rotations said continuous centers of rotation describe substantially a so called centrode curve. The unbalancing of the rotor 21 is accomplished by a plurality of bores 29 arranged on an arc to one side of the center of the cylinder 21. Each bore 29 extends from the top to the bottom of the cylinder 21 and it is internally threaded. Full length or shortened screw

plugs 31 may be threaded into any selected bores 29 for regulating and adjusting the throw or radius of shifting of the rotor 21 to any selected degree and intensity. Thus an adjustable lateral or radial unbalancing of the rotating mass is achieved.

The depth of vibration of the rotor 21 may be modified by unbalancing the same at one side and near one end only. By such additional adjustment the center of gravity of the rotor 21 is not only shifted radially or laterally off the center of rotation, but also axially. In this illustrative embodiment such additional unbalancing is accomplished by providing a plurality of short holes 32 in the top of the rotor 21 on the side opposite to the bores 29. The holes 32 are threaded to accommodate short screw plugs 33. When the plugs 33 are made of the same weight as that of the material removed from the holes 32 then the cylinder has only a limited axial vibration. In the event lighter or heavier plugs 33 are substituted, or some or all of the plugs 33 are entirely removed then the axial unbalancing of the rotor 21 is augmented and a correspondingly stronger and deeper vibration is accomplished. If so desired instead of the individual holes 32, a corner of the top of the rotor 21 may be cut away to a limited depth, and replaceable counterweights may be suitably secured to fill or partially fill and balance said cut away portion according to the required intensity of axial vibration.

A guard cup 34 protects the hollow support 11 from contact with the rotor 21 during the manipulation of the device. The bottom of the guard cup 34 is fixed between the journal plate 14 and the pad 9. The sides of the guard cup 34 are split and extend into the space between the rotor 21 and the support 11, and are suitably spaced from both. Thus any possibility of the cutting of the comparatively soft support 11 by the rotor 21 is obviated even when the support 11 is flexed and compressed or twisted.

The flexible drive shaft 28 is journaled in a solid portion of the handle 6 and the neck 7. A flexible tube 36 is suitably secured at one end into the neck 7 and at its other end to a suitable electric motor 37. The shaft 28 extends in said tube 36 to the shaft of the motor 37. The motor 37 is preferably mounted on a pad 38 provided with shoulder straps 39, so that the whole unit is easily adapted to be carried on the back and shoulders of the operator and form a portable unit when such use is advantageous. The motor 37 is connected to a source of electricity by the usual cord 41.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. In a massaging and vibrating device the combination with a handle, and a flexible support extended from the handle, of a pad so shaped as to simulate the ball of the palm of a hand on said flexible support, and a rotating mass journaled on said pad being adapted to shift its center of rotation on a substantially circular path so as to continuously shift the pad relatively to said handle, said flexible support being hollow and said rotating mass being spaced from the inner periphery of said support, and a guard movable with the pad being disposed between the rotating mass and said support.

2. In a device for massaging and vibratory treatment comprising a holder adapted to be gripped by the hand, a pad shaped to simulate the ball of the palm of a hand, a hollow flexible support connected at one end to said holder and

at its other end to said pad, a journal on the pad within said hollow support, a rotatable unbalanced body on said journal, a flexible drive element connected to said body to impart rotation thereto, and a guard on the pad being extended between said body and said hollow support.

3. In a device for massaging and vibratory treatment comprising a holder adapted to be gripped by the hand, a pad shaped to simulate the ball of the palm of a hand, a hollow flexible support connected at one end to said holder and at its other end to said pad, a journal on the pad within said hollow support, a rotatable body on said journal, a flexible drive element connected to said body to impart rotation thereto, and a guard on the pad being extended between said body and said hollow support, a plurality of threaded apertures extended through said body to one side of the center of rotation of said body, and removable loading means for said apertures for adjusting the eccentric balance of said body, and adjustable means near the top of said body to the other side of the center of rotation to cause an off balance and vibration of said body.

4. In a massaging device the combination with a handle, a hollow flexible support extended from the handle, and an unbalanced rotary vibrator, of a bottom on said flexible support a journal on said bottom on which said rotary vibrator is supported, flexible means to impart rotation to said rotary vibrator, means imbedded in said bottom to fixedly secure said journal to the bottom, and a rounded pad integrally united with the exterior of said bottom so as to cover and integrally fix said journal support in said bottom.

5. In a massaging device the combination with a massaging pad and rotary vibrator acting on said pad, of a hollow, twistable cushion extended from said pad so as to encase said vibrator, and a rigid handle on the free end of said cushion adapted to be gripped by the palm of the hand of an operator, said cushion and said handle being in substantial axial alignment with the pad so as to allow the exertion of axial pressure on the pad simultaneously with lateral twisting and rocking of said cushion relatively to said pad.

6. In a massaging device the combination with a massaging pad and rotary vibrator acting on said pad, of a hollow twistable cushion extended from said pad so as to encase said vibrator, and a rigid handle on the free end of said cushion adapted to be gripped by the palm of the hand of an operator, said cushion and said handle being in substantial axial alignment with the pad so as to allow the exertion of axial pressure on the pad simultaneously with lateral twisting and rocking of said cushion relatively to said pad, and a lateral extension on said handle whereby said handle is rested on top of the hand of the operator.

7. In a massaging device in combination a flexible cushion, a massaging pad at one end of the cushion, a rotary vibrator within the cushion journaled on the pad, a flexible driving member for said vibrator, and a handle on the other end of said cushion, said vibrator rotating in a plane substantially parallel with the surface plane of said pad, said cushion being shiftable with the pad relatively to said handle.

8. In a massaging device in combination a flexible cushion, a massaging pad at one end of the cushion a rotary vibrator within the cushion journaled on the pad, a flexible driving member for said vibrator, and a handle on the other end of said cushion, said cushion being shiftable with the pad relatively to said handle said handle having a conical exterior tapering away from said cushion, and a lateral extension on said handle to be engaged by the top of an operator's hand as the hand grips said handle.

9. In a massaging device in combination a hollow flexible cushion, a massaging pad on one end of said cushion, a handle on the other end of said cushion, an unbalanced rotor within said cushion journaled on the pad, and a flexible driving element extended through said handle from the outside into said cushion and being connected to said rotor so as to alloy said rotor to shift with said pad relatively to the handle.

10. In a massaging device in combination a hollow flexible cushion, a massaging pad on one end of said cushion, a handle on the other end of said cushion, an unbalanced rotor within said cushion, a journaled plate fixed on said pad, a spacing element extended upwardly from said plate, coacting bearing elements on said spacing element rotatably supporting said rotor so as to hold said rotor spaced above said journal plate.

11. In a massaging device in combination a hollow flexible cushion, a massaging pad on one end of said cushion, a handle on the other end of said cushion, an unbalanced rotor within said cushion, a journal plate fixed on said pad, a spacing element extended upwardly from said plate, a journal extended from said spacing element, coacting bearing elements on said spacing element rotatably supporting said rotor so as to tiltably hold said rotor spaced above said journal plate, the periphery of said rotor being spaced from said cushion.

12. In a massaging device of the character described the combination with a hollow flexible cushion supporting a massaging pad, and a vibrating rotor connected to the pad, the periphery of said rotor being spaced from said cushion, and guard means extended into said space between the rotor and the cushion.

EDWARD L. TORRISON.