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2,951,479

EXERCISE AND MASSAGE DEVICE

Filed June 5, 1958

2 Sheets-Sheet 1

Fig. 1.

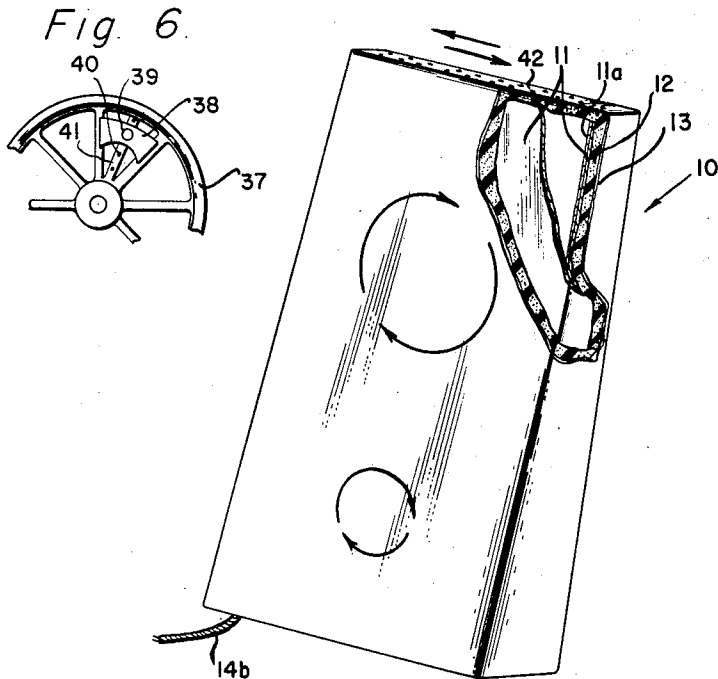
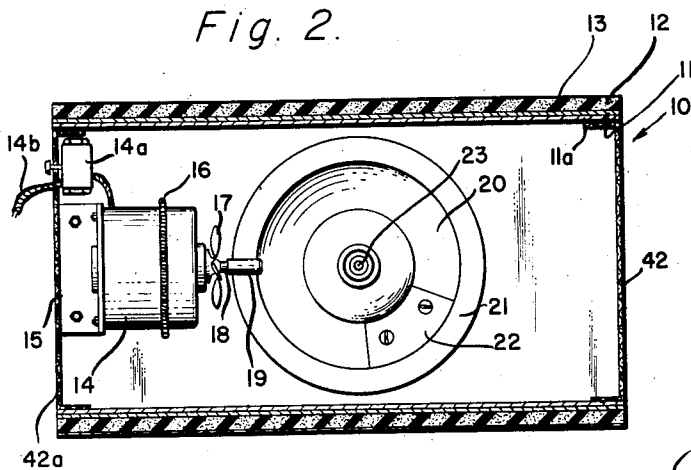


Fig. 2.



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Fig. 3.

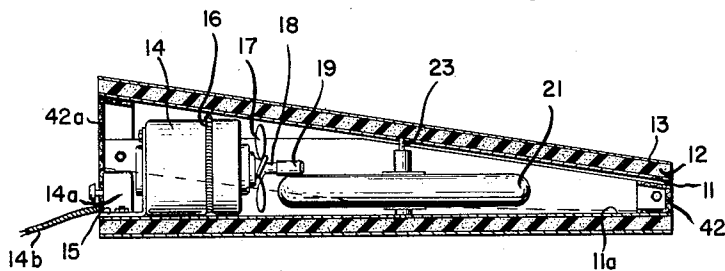


Fig. 4.

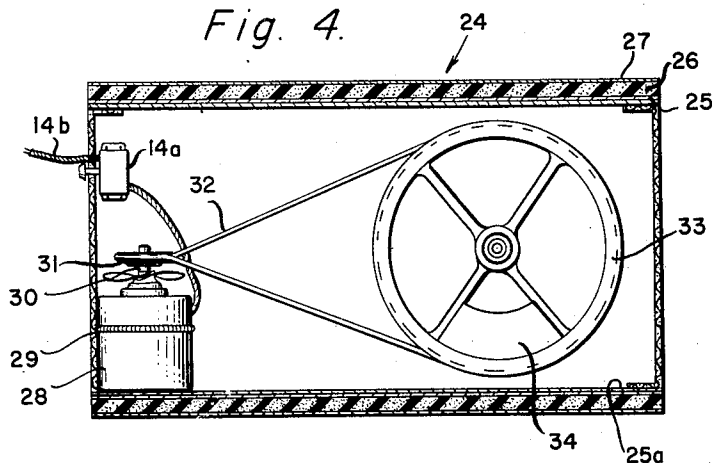
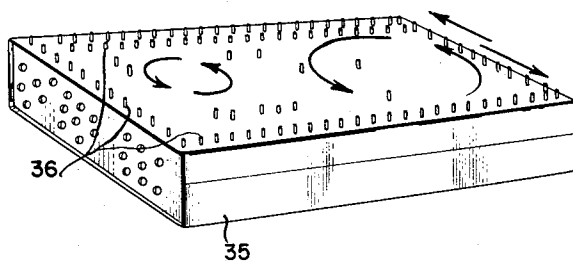


Fig. 5.



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EXERCISE AND MASSAGE DEVICE

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8 Claims. (Cl. 128—33)

The present invention relates to a therapeutic device and more particularly to exercising and massage apparatus. The invention relates especially to massage and exercise pillows and cushions and similar apparatus and devices designed to provide an exercising or massaging action to an area of the human body in contact therewith or in contact with supports on which such devices are mounted.

Conventional massage pillows of a type previously known utilized an unbalanced weighted motor shaft which is designed to produce a vibratory or gyratory motion focused on the motor or shaft itself. As a result the amplitude and frequency of the type of motion produced is dependent upon the degree of unbalance provided by the weight on the motor shaft and by the rotational velocity of the motor shaft itself. Due to space and structural limitations, the degree and extent of these movements is thus rather limited. Furthermore, the fact that the torque and other forces producing these movements are focused on the motor itself results in an unusual degree of wear of bearings and other damage to the motor as well as its mounting. Furthermore, the nature of the movement itself is limited and since the motor shaft is generally positioned in the same plane as the operative surface of the unit and since the unbalanced torque is in a direction normal thereto, the type of vibratory movement produced is also in a direction normal or perpendicular to said surface, or at least the effective force transmitted is of this nature.

In accordance with applicant's invention he has discovered a device of the type described in which the torque and other gyratory or oscillatory forces producing the movement required is independent of the motor itself so that these forces are not directly imposed on the motor or its drive shaft, and furthermore he has discovered a construction which will utilize an unbalanced weighted rotary member in such a manner that a higher degree of torque is obtained with the result that a variable degree or frequency of oscillation is obtained at spaced points along the surface of the device. As a result, different frequencies and amplitudes of movement are obtained while at the same time minimizing or avoiding any undue wear or stress upon the motor or any bearings associated therewith. In addition to the foregoing advantages, applicant has discovered that the gyratory motion or oscillations obtained may be produced in the plane of the effective surface of the device or in a plane parallel thereto rather than in perpendicular planes as is characteristic of the prior art.

The device of the invention may be applied to any portion of the human anatomy or may be positioned upon a support and the body or any portion which is desired to be exercised or massaged placed thereon or thereover. Furthermore, it has been found that a device of this type, having a gyratory or oscillatory movement, can transmit this movement to a support upon which it is positioned so that when placed upon a bed, cot, table or chair, the supporting surface can be caused to have a gyratory or os-

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cillatory motion corresponding to the motion of the device itself.

It is therefore an object of the invention to provide an exercising or massaging device which is highly effective in producing gyratory or oscillatory movement which can be imparted to selected portions of the human anatomy.

A further object of the present invention is to provide an exercising or massaging device in which oscillatory movements of an effective amplitude are imparted to surfaces thereof.

A further object of the present invention is to provide an exercising device in which a plurality of different oscillatory movements are produced which are in the same plane as well as being in a plane parallel to the surface of the device.

An additional object of the present invention is to provide a device of the type described wherein an unbalanced torque is produced in a member which is separate from the motor itself or its drive shaft, thereby minimizing wear and stress upon the motor itself.

The invention possesses many other advantages and has other objects which may be made more clearly apparent from a consideration of typical forms in which it may be embodied. Such embodiments are illustrated in the drawings accompanying and forming part of the present specification. These will now be described in detail for the purpose of illustrating the general principles of the invention, but it is to be understood that such detailed description is not to be taken in a limiting sense since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is a view in perspective of one of the devices of the invention, partly in cross-section for the purpose of illustrating the surface structure thereof;

Fig. 2 is a transverse cross-sectional view partly in elevation illustrating the internal construction of one form of the invention;

Fig. 3 is a vertical cross-sectional view partly in elevation corresponding to Fig. 2.

Fig. 4 is a transverse cross-sectional view, partly in elevation, illustrating the structure of a modified form of the invention;

Fig. 5 is a view in elevation illustrating a unit of the invention illustrating the nature of the gyratory movement as well as a surface construction thereof;

Fig. 6 is a view in elevation of a modified form of the invention relating to the unbalanced unit which produces the oscillatory motions.

As described in Figures 1 to 3 of the drawings, the exercising unit or cushioning device 10 is provided with a metal shell formed in two matching parts 11 and 11a with overlap at the sides. The operative elements of the device are enclosed within this shell. For the purpose of practical use and comfort, the shell is provided with an external layer 12 of cushioning material which may be sponge rubber or other cellular resilient material or may be fibrous padding or quilted material or the like. A cover 13 of fabric, sheet plastic or the like is applied over the cushioning material. As will be described further below, unit 10 is designed to have a gyratory or oscillatory movement created therein in substantially the same plane as its exposed effective surfaces. Furthermore, as indicated by the arrows, the amplitude of these vibrations is greater at one end than at the other. The ends of the shell may be enclosed by perforated metal members or screens 42 and 42a which will permit ventilation of the unit.

As shown in greater detail in the Figures 2 and 3, the unit is provided with a motor 14 which is attached to one surface interiorly of the shell of the unit by means of a bracket 15 and held in position by means of a

clamping member 16. The motor is provided with a shaft 18 and a small fan or blade member 17 for the purpose of circulating cooling air over the motor. The shaft is provided with an enlarged sleeve or bushing 19 which in turn is in rotational planetary engagement with rim 21 formed on circular member 20 which is in the form of a wheel mounted and driven around a shaft member 23 which is journaled in the top and bottom segments of the shell. The wheel is provided with a weight 22 which is positioned adjacent to the rim so that this member becomes unbalanced on rotation. A rheostat 14a is provided in series with the power supply to the motor for the purpose of regulating the speed thereof and is interposed in the electric cord 14b which supplies current to drive the motor. It is apparent that the location of member 19 which engages the rim 21 of the wheel will cause rotation thereof in substantially the plane of the unit and substantially parallel to the surfaces thereof. The rim may be covered with rubber or other resilient material to provide frictional engagement with the driving sleeve on the motor shaft. The unbalance due to the positioning of the weight will create a certain degree of torque which will cause oscillation or gyratory movement of the unit unless it is rigidly held in position. Due to its spaced position from the motor, this gyratory motion will tend to pivot about the motor itself with said motor being somewhat of a focal point but itself not being subjected to the direct torque of the rotating weight. The net effect when the unit is in use or engagement with a portion of the human body, is to provide a dual lateral rotary movement which is distributed all over the surface of the unit, the amplitude and extent of this movement being greater in the area adjacent to the rotary wheel and substantially less in the area adjacent to the motor itself. The torque created will of course cause movement of the entire unit with, however, the differential amplitude being the result of the relative position of the rotary member and the motor drive shaft. This can be varied to a considerable degree by positioning the rotary wheel closer or farther from the motor or by selecting a rotary member having a greater or less diameter and by driving this member at a greater or lesser velocity. In general, a relatively high speed motor is used having a shaft r.p.m. of the order of 10,000 per minute transmitted through a drive on its shaft having a diameter of $\frac{1}{2}$ to 2 inches to a wheel or pulley member having a diameter of 4 to 10 inches. This results in a speed or rotation of the rotary unbalanced or eccentric member ranging generally from 500 to 2,000 r.p.m.

In the modified form of the invention illustrated in Fig. 4, unit 24 is provided with a receptacle or container of sheet metal formed in two sections 25 and 25a and covered with a layer of cushioning material 26 such as sponge rubber, cotton padding, or the like, and outer cover 27 of sheet plastic or upholstery fabric. Internally, motor 28 held in position by means of a clamp 29, is provided with a fan member mounted on a shaft 30 and a pulley 31 which drives belt 32 in engagement with a pulley member 33. This pulley is of considerably greater diameter than the pulley on the motor and is provided with a weight 34 positioned adjacent the circumferential rim of the pulley in order to create an unbalanced torque when the pulley is rotated. As described in connection with Figs. 2 and 3, rotation of the pulley will create an unbalanced torque which will be transmitted to the unit in the form of lateral oscillatory or gyratory motion tending to pivot about the motor area at the other end of the unit. This creates a differential type of motion such as is illustrated in Figs. 1 or 5 by the arrows.

In the form of invention illustrated in Fig. 5, a unit having a uniform rectangular cross-section rather than a wedge-shaped cross-section as shown in Figs. 1 and 3 is illustrated. This unit is provided with a cover having massaging fingers 36 thereon formed in a plastic or rubber cover which may be molded or otherwise preformed

before application to the receptacle which houses the drive unit. The drive unit may be of the type illustrated in either Figs. 2 and 3 or Fig. 4, the general configuration of the movement obtained being illustrated in Fig. 5.

The extent of the torque and the amplitude of the gyratory motion may be regulated to a certain extent by adjusting the radial position of the weight. This is illustrated, for example, in Fig. 6 where pulley 37 is provided with weight 38, which is mounted by means of a bolt 39 in openings 40 provided in radial member 41. By moving this weight outward, a greater degree of torque may be obtained and by moving inward the amount of torque may be reduced. These adjustments may take place prior to assembly of the unit.

In the operation of the device, the unit is placed with its oscillatory surface in engagement with any desired portion of the human anatomy and held in that position with the speed of the unbalanced rotary member regulated by means of the rheostat. The unit may be used while a person is in a reclining position by placing it upon the chest or stomach and allowing the unit to become operative in an oscillatory manner. If desired, the unit may be held in position by means of the hands while on the desired portion of the anatomy, in which case the vibratory action will be transmitted not only to the portion of the anatomy with which the unit is in contact but also through the arms to the shoulders thereby causing movement and muscular exercise of other portions of the anatomy. The unit may be applied to the arms or the legs or calves of a person as well as to the back, hips or thighs as the case may be. In the standing or sitting position the unit may be held in the arms against any desired portion of the anatomy and caused to function in the manner described above in which case the lateral oscillatory motion will be transmitted to that particular portion of the anatomy. The unit may be positioned in a chair, either on the seat or against the back, particularly where back exercise is desired, in which case the person using it will lean against the unit which is in position between his back and the back of the chair while it is in operation. It has been found that the lateral movement imparted by this device is transmitted not only to the person but also to the chair itself causing it to vibrate as well. The unit may also be placed in a horizontal position on a bed, either directly on the bed itself, under the pillow or under the mattress. The nature and amplitude of the oscillatory motion is such that these movements are transmitted to the user, who is also positioned on the bed. The same results are obtained by laying the unit horizontally upon a cot or pad upon which the user sits or reclines. In such case, the lateral movement is transmitted to the cot and through its surface to the user, thus resulting in a type of movement which will create a useful degree of exercise and bodily stimulation.

The device may be utilized in an automobile or other vehicle, being placed between the back of a passenger or driver and the seat and connected to the power supply either through an inverter, or by utilizing a 6 or 12 volt D.C. motor as the drive for the unit. The device may also be utilized by clamping it or otherwise mounting it on a chair or cot to provide general vibratory or oscillatory movement thereof. In this type of use the device is preferably affixed to a horizontal cross member or to a leg of the cot or chair and the pulsations of the device are then transmitted to the body supporting surface.

It is frequently desirable that the motor be mounted in a somewhat resilient or non-rigid manner. This may be accomplished by placing a thin pad of rubber, cork or other cushioning material beneath the motor support bracket 15 (Figures 2 and 3), or by joining the bracket with its vertical support portion hinged to the base to permit the motor to be tilted upwardly when spring

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clamping member 16 is removed and when 16 is in place, to permit a slight amount of play or movement of the motor. In this way the possibility of fracture of the support bracket through vibration or the like may be minimized.

Having illustrated preferred embodiments of this invention, it is to be understood that various changes therein may be made without departing from the spirit thereof, and its scope is not to be limited except by the terms of the appended claims.

I claim:

1. Therapeutic apparatus comprising an enclosure having upper and lower spaced walls, an eccentrically weighted member rotatably mounted between said walls and journaled thereon, a motor means having a shaft also positioned within said enclosure mounted between said walls and spaced from said member, and means communicating between the shaft of said motor and said member in frictional driving engagement therewith.

2. Apparatus for therapeutic purposes having an oscillatory surface movement which comprises a relatively shallow enclosure having spaced upper and lower walls, a rotatable member having a weight eccentrically mounted thereon journaled between said walls, said rotatable member adapted to rotate between said walls and substantially parallel thereto, a motor means positioned within said enclosure and mounted between said walls in spaced relationship to said rotatable member, a shaft on said motor, and means communicating in frictional engagement between said shaft and said rotatable member for driving same, whereby torque created by rotation of said rotatable member is transmitted to said walls causing an oscillatory movement in the plane thereof.

3. A vibratory device in a housing for producing gyratory motion in a plane disposed parallel to a major surface of said housing, said device including the combination of, a housing having a pair of spaced apart major surfaces, an unbalanced rotatable member disposed between said surfaces and being affixed to each of said surfaces, said rotatable member having a plane of rotation disposed substantially parallel to at least one of said major surfaces, and drive means supported within said housing and having only frictional engagement with said rotatable member, whereby rotation of said rotatable member by said drive means imparts a gyratory motion to said surfaces to which said rotatable member is affixed.

4. A vibratory device in a housing for producing gyratory motion in a plane disposed parallel to a major surface of said housing, said device including the combination of, a housing having a pair of spaced apart major surfaces, an unbalanced annular member rotatably mounted between said surfaces and affixed to each of said surfaces, said annular member having a plane of rotation disposed substantially parallel to at least one of said major surfaces, and drive means supported within said housing and having only frictional engagement with said annular member, whereby rotation of said annular member by said drive means imparts a gyratory motion to said surfaces to which said annular member is affixed.

5. A vibratory device in a housing for producing gyratory motion in a plane disposed parallel to a major surface of said housing, said device including the combination of, a housing having a pair of spaced apart major surfaces, a shaft having its end portions affixed

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to said surfaces, an unbalanced annular member rotatably mounted upon said shaft, said annular member having a plane of rotation disposed substantially parallel to at least one of said major surfaces, and drive means supported within said housing and having only frictional engagement with said annular member, whereby rotation of said annular member by said drive means imparts a gyratory motion to said surfaces to which said annular member is affixed.

6. A vibratory device in a housing for producing gyratory motion in a plane disposed parallel to a major surface of said housing, said device including the combination of, a housing having a pair of spaced apart major surfaces, a shaft supported between and affixed to said surfaces and disposed substantially perpendicular to at least one of said surfaces, an eccentrically weighted wheel rotatably mounted upon said shaft, said wheel having a plane of rotation disposed substantially parallel to at least one of said major surfaces, and drive means supported within said housing and having only frictional engagement with said wheel, whereby rotation of said wheel by said drive means imparts a gyratory motion to said surfaces to which said wheel is affixed.

7. A vibratory device in a housing for producing gyratory motion in a plane disposed parallel to a major surface of said housing, said device including the combination of, a housing having a pair of spaced apart major surfaces, a shaft supported between and affixed to said surfaces and disposed substantially perpendicular to at least one of said surfaces, an eccentrically weighted wheel rotatably mounted upon said shaft, said wheel having a resilient material about the periphery thereof, a motor mounted within said enclosure, and a motor shaft extending from said motor and in frictional engagement with said resilient material, said wheel having a plane of rotation disposed substantially parallel to at least one of said major surfaces, whereby rotation of said wheel by said drive means imparts a gyratory motion to said surfaces to which said wheel is affixed.

8. A vibratory device in a housing for producing gyratory motion in a plane disposed parallel to a major surface of said housing, said device including the combination of, a housing having a pair of spaced apart major surfaces, a shaft supported between and affixed to said surfaces and disposed substantially perpendicular to at least one of said surfaces, an unbalanced annular member rotatably mounted upon said shaft, said annular member having a plane of rotation disposed substantially parallel to at least one of said major surfaces, a motor mounted within said enclosure, and a motor shaft extending from said motor and in frictional engagement with said annular member at substantially a single point thereof, whereby rotation of said annular member by said drive means imparts a gyratory motion to said surfaces to which said annular member is affixed.

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