

HEATING PAD WITH VIBRATOR

This invention relates to a heating pad in combination with a vibratory device for massaging a portion of the anatomy and a control module for controlling the heating pad temperature and the motor in the vibratory device.

5 Many types of heating pads, in combination with a vibrator and a control module, are known in the prior art.

10 Taylor, U. S. Patent 3,710,784, issued January 16, 1973 discloses a heating pad with a removable vibrator wherein both the heating pad and vibrator are controlled by a control module. The vibrator contains a motor with eccentric weights rigidly attached to a flexible vibrating plate. The plate has projections extending from a surface thereof which fit into openings in the heating pad.

15 The Taylor vibrator is constructed so that not only does the vibrating plate vibrate, but also the vibrator housing. This causes the Taylor vibrator to be vulnerable to dampening when, for example, weight or pressure is applied to the housing. Because of the foregoing, the motor required to achieve a desirable vibration intensity is relatively large and heavy and the power requirements are high. In addition, the vibrator is inconvenient to use since it requires a pad
20 which is made especially to receive the projections on the vibration plate. The control module contains adjustable knobs for controlling

the speed of the vibrator and the temperature of the heating pad. The circuitry has resistors and field windings. Thermostats are also provided. There is no means for detachably connecting the vibrator to the control module.

- 5 The prior art does not teach a vibrator suitable for use with a heating pad having a floating vibrating plate which does not transmit any substantial vibration to the motor housing. In addition there are no control modules taught which are attached to an appliance, e.g., a heating pad and have a transformer/rectifier and a jack for receiving
10 a plug from a second appliance, e.g., a vibrator.

Finally, in the case of a cordless vibrator, there are no units in which the battery is attached to the upper housing and the vibrator motor is attached to a floating vibration plate in the lower housing.

- 15 There is a need for a heating pad which can be used with a vibrator which vibrator is not vulnerable to dampening, has a relatively small, light motor with low power requirements, and can be attached by a jack plug to a control module having a transformer/rectifier therein.

- 20 There is also a need for a vibrator which can be used either alone or with a variety of substrates such as heating pads, blankets and the like; is not vulnerable to dampening; has a relatively small, light motor with low power requirements; can be attached to a control module and can be adapted to be cordless.

It is an object of this invention to provide an electric heating pad in combination with an electrically powered portable vibrator with a vibrating plate that does not impart significant vibration to the vibrator housing and a control module with an transformer/rectifier,
5 and a multiposition slide switch and which controls both the vibrator and heating pad.

It is a further object of this invention to provide an electrically powered portable vibrator which has a vibration plate that does not impart significant vibration to the vibrator housing.

10 It is a further object of this invention to provide an electrically powered portable vibrator which has low power requirements and a small motor with an eccentric weight on a rotary shaft.

15 It is an additional object of this invention to provide an electric heating pad in combination with an electrically powered portable vibrator with a vibrating plate that does not impart significant vibration to the vibrator housing.

The present invention provides a vibrating electric heating pad comprising:

an electric vibrator physically attached to said heating pad by means of detachable fasteners; and electrically
5 connected by wires to a control module; said electric vibrator comprising a housing having therein a rotary motor with an eccentric weight on its shaft, said motor being attached to a vibration plate protruding through an opening in the base of the housing; said vibration plate suspended
10 in said housing by a resilient mounting; said control module electrically connected to said vibrator and said heating pad for controlling the heating pad heating elements and the motor in the vibrator, said control module comprising a housing having therein a transformer/rectifier; a
15 slide control switch and a jack socket for receiving said wires from said vibrator, a wire connected to said heating pad; and a main power cord for plugging into an electric power source.

The present invention also provides a portable
20 electric vibrator comprising a housing having therein a rotary motor with an eccentric weight on its shaft, said motor attached to a vibration plate protruding through an opening in the base of the housing, said vibration plate suspended in said housing by a
25 resilient mounting, and a means for connecting said motor to an electric power source.

FIGURE 1 is a side elevational view of the vibrator used in this invention;

FIGURE 2 is a top sectional view of the vibrator taken along line 2-2 of Figure 1 showing the foam cushion which supports the vibration plate;

FIGURE 3 is an end sectional view taken along line 3-3 of Figure 1 showing the relationship of the vibration plate, foam cushion and housing;

FIGURE 4 is a sectional view taken along line 4-4 of Figure 1 showing the motor and motor bracket;

FIGURE 5 is a bottom plan view of the vibrator;

FIGURE 6 is a top plan view of a typical heating pad used in this invention;

FIGURE 6A is a side sectional view of a battery powered embodiment of this invention;

FIGURE 7 is a top plan view of the control module in combination with a heating pad and a vibrator;

FIGURE 8 is a top plan view in section of the control module; and

FIGURE 9 is a side elevational view in section of the control module.

DETAILED DESCRIPTION

As shown in Figure 1, the vibrator used in this invention comprises a hollow vibrator housing 1 containing therein an electrical vibration motor 7. The motor 7 is powered by electricity received through a cord 13 which can be attached to the motor 7 by tabs 70 and
5 to the control module 24 depicted in Figures 8 and 9 through a jack plug 44, as shown in Figure 7, or can be a conventional plug which can be plugged directly into an electrical outlet, not shown. The control module 24 receives power from a power cord 25 which plugs into an electrical outlet, not shown.

10 The hollow vibrator housing 1 is comprised of an upper housing 2 and a lower housing 3, each made of an impact resistant heat stable, molded plastic. The upper housing 2 and lower housing 3 are attached at their peripheral edges by any conventional means, however, ultra-sonic welding is preferred. The vibrator housing 1 viewed from the
15 top or bottom can be of any shape which is suitable for holding in the hand, a generally rectangular shape is preferred. Viewed from the side, the housing 1 can be generally rectangular or the upper corners can be removed so the upper housing 2 has a three surface top. The shape of the vibrator housing 1 is not critical to the invention, how-
20 ever, it should be of such a shape and size that a vibrating motor can fit inside or if desired, it can be shaped to accommodate a battery with the motor as shown in Figure 6A.

The lower housing 3 has an opening in the bottom thereof of generally rectangular shape into which a vibration plate 5 is inserted.
25 Preferably the opening is centrally located.

The vibration plate 5 is generally of a rectangular dish shape with a flat base and an outward extending flange 6 around the periphery. The flange 6 is generally parallel to the base of the vibration plate. The flange 6 fits into the housing 1 at about the level of the

seam where the upper housing 2 and lower housing 3 are attached. The flange 6 is supported by a resilient mounting, e.g., a foam cushion 11, which is in the housing 1 and around its inside circumference where the upper housing 2 and lower housing 3 are attached as shown in Figures 1, 2 and 3. A spring or other resilient mounting can be used in place of the foam, however, since a foam cushion is preferred, it will be used to illustrate the invention. The flange 6 is surrounded by the foam cushion 11, as shown in Figures 1 and 3. The foam cushion 11 is preferably a polyether polyurethane foam. However, any foam cushion can be used if it has sufficient stability under the conditions of use and is sufficiently elastic to permit the vibration plate 5 to move as described below.

The base of the vibration plate 5 is smaller in its outside dimensions than the opening in the lower housing 3. In addition, the upper housing 2 has spaced apart rigid ribs 71, 72 and 73 depending downward toward the foam cushion 11 and resting on a thin roof 74 over the foam cushion 11. The roof 74 is made of stiff paper or plastic and provides a support for the cushion 11 to press against when the vibration plate 5 moves. The center rib 72, as shown in Figure 2 deforms the sponge 11 so the vibration plate 5 can move without hitting the housing 1. The dotted lines in Figure 1 show the lateral movement of the vibration plate 5. This permits the vibration plate 5 to vibrate without contacting the housing 1. The foam cushion 11 which supports the vibration plate 5 in the housing 1 has sufficient elasticity to enable the plate 5 to be pushed until its base is flush with the bottom of the lower housing 3. However, the roof 74 and insufficient give to the foam 11 prevent the plate 5 from contacting the housing 1. This independent suspension in the foam cushion 11 enables the plate 5 to move in a floating pulsating motion. The vibration plate 5 can be flexible, inflexible or partially flexible. Preferably, it is made of an inflexible impact and heat resistant molded plastic.

The vibrator motor 7, having an eccentric weight 8 on its rotary shaft 4, is attached to the vibration plate 5. The attachment can be a slotted bracket 9 which can be attached to the vibration plate 5 by fasteners 10, e.g. rivets, bolts, and welded to the motor 7 as shown in Figure 4. The motor 7 is held in place between bosses 50 on the inner surface of the vibration plate 5. This ensures that the vibration caused by the motor 7 is minimally conducted to the housing 1 and maximally conducted to the vibration plate 5. Because the plate 5 is suspended in the foam cushion 11, it cannot conduct any substantial vibration to the housing. The vibration action of the plate 5 is, because it is free floating, an orbiting movement that feels like fingers massaging rather than vibration in one plane which is characteristic of conventional magnetic vibrators. The desirable orbiting movement effect is enhanced by the manner in which the motor 7 is attached to the vibration plate 5. If the rear end bell 12 of the motor 7, opposite the eccentric weight 8 is fixed securely to the vibration plate 5, either at a right angle, or by a bracket 9, mounting it to the plate 5 so that the axis of the motor 7 is substantially between a right angle (90°) to parallel to the vibration plate 5, this mounting causes the motor 7 and plate 5 to move in an orbiting movement with massaging action. The mass of the motor 7 and plate 5 together with the spring rate of the foam cushion 11 comprises a spring-mass system forced by the eccentric swinging weight 8, materially increasing the efficiency of the system so that very little power is required. Thus, if a battery is used to power the motor 7, typically, a 1.5 volt battery expending less than a conventional magnetic vibrator consuming 5-10 watts is suitable.

The motor 7 of the vibrator shown in Figure 1 is connected to a jack socket 42 in the control module 24 depicted in Figures 8 and 9, by a cord 13 with a jack plug 44. The cord 13 enters the housing 1 of the vibrator and is wrapped around a strain relief post 60, then is connected to the motor 7 by tabs 70 on each side of the motor 7. The control module 24 is connected to a power source by a power cord 25 as shown in Figure 7.

The control module 24 operated by a slide switch 27, operates to turn the vibrator motor 7 on and off and also can control its speed by inclusion of a rheostat. The vibrator can be used alone or can be used with other devices such as a heating pad, hand bath or foot bath. If the vibrator is used with a heating pad, for example, the control module 24 can be connected to the heating pad by cord 53 and control the heating element 90 in the heating pad 19 as well as the vibrator motor 7.

The motor 7 used can be relatively small and still give the desired effect. Thus, for example, a motor of about 1500-2400 RPM, preferably 1600-2000 RPM, most preferably 2000 RPM are suitable.

The control module 24 as shown in Figures 8 and 9, is a combination of a step-down transformer/rectifier 37 and a multi-position slide switch 27 in a single control module.

The control module 24 is connected to a first appliance such as the heating pad 19 with a three wire cord 53, to the vibrator depicted in Figures 1-5 by means of a jack socket 42 which receives a jack plug 44 from the vibrator, and an outside power source with power cord 25. The control module 24 comprises a hollow housing 28 made of an upper housing 29 and a lower housing 30 held rigidly together by screws 31 and 32. The control housing 28 is made from an impact resistant plastic.

Inside the control housing 28 is located the wire strain relief 33 around which the outside power source cord 25 is placed, the power source cord 25 has one wire lead 34 to a slide switch 27 and another wire lead 36 through a connector 80 to a step-down transformer 37. The step-down transformer 37 can be a full wave center tap rectified 3 watt, 4.5 volt open circuit, and 1.35 volts at 500 milliamperes when loaded. This transformer 37 reduces and rectifies the incoming 110 volts alternating current to under 20 volts direct current to a second

appliance such as the vibrator, by wire 43, jack socket 42 and disconnectable jack plug 44 through wire 13 as shown in Figures 7 and 8. The transformer 37 is also electrically connected by wires 38 around wire strain relief 81 to the cord 53 leading to the first appliance, e.g., the heating pad 19. It is possible, moreover, to modify the wiring so the first as well as the second appliances are attached to the control module 24 by jack plugs.

The switch 27, a two pole, four position unit, is electrically connected through a diode 39 and a resistor 40 to a neon lamp 41 which indicates whether the switch is on or off. The neon lamp 41 is also connected electrically either directly by wire 82 to the transformer 37 and thence to the jack socket 42 or indirectly through a capacitor 83 which acts as a radio frequency filter.

The transformer 37 is also electrically connected to a phone type jack socket 42 by wires 43. The jack socket 42 receives a connecting male plug 44 from the vibrating motor 7 by a cord 13.

The slide switch 27 can have from three to five pole positions depending on the use intended. When used with the vibrator shown in Figures 1-5 and the heating pad 19, as shown in Figures 6 and 7, there are four poles, off, low heat, high heat and medium heat. The switch 27 can also be wired to control a vibrator separately from the heating pad. According to the preferred embodiment of the invention, when the heating pad 19 is turned on, the vibrating motor 7 is also turned on. If heat only is desired, the jack plug 44 is unplugged, turning off the vibrator motor 7.

Inside the hollow housing 28 of the control module 24 are projections 84 on the inside wall of the housing 28 which support and hold the various structures contained therein.

The vibrator housing 1, as shown in Figures 1, 3, 5 and 6A has detachable fasteners 22 such as velcro hooks as illustrated, removable adhesive fasteners or snaps on the bottom surface of the lower housing 3, at each end. These fasteners 22 adhere to, for example, clothing, blankets or the cover, usually cloth, of the heating pad 19. The cover of the heating pad has matching velcro loop strips 45. Other fasteners such as a series of snaps can be used if the vibrator has matching snaps. ("Velcro" is a registered Trade Mark).

The heating pad 19 as depicted in Figure 6, is of a conventional wrap-around design with a cloth cover containing velcro loop fasteners 45 for receiving the velcro hooks 22 on the vibrator. The heating pad 19 has wire heating coils 90 inside and a thermostat 91 to prevent overheating. The heating coils 90 are held in place by a flexible wire screen 92. The heating coils 90, screen 92 and thermostat 91 are held in place by a vinyl cover 93 which is spot heat sealed 94 between the loops of the wire heating coils 90. The pad 19 can be held in place on the body by a belt 20, with a buckle comprising a female locking member 23 and a male locking piece 21. The belt 20 is attached to a cloth outer cover.

The battery operated embodiment is shown in Figure 6A wherein a battery 17 can be attached to the upper housing 2 by a battery holder clip 61. If the battery 17 is a primary battery, it can be replaced when worn out, by removing the battery 17 out of a door 16 in the upper housing 2. No door is needed if the battery 17 is rechargeable. A rechargeable battery 17 is recharged through plug in transformer 60 and a supply cord 62 which is either permanently attached or is attached by a plug and jack 63. The battery operated vibrator is switched off and on by a single pole single throw switch 64 which operates the circuit between the battery 17 and the motor 7 by wires 65 between the switch 64 and a battery contact 66, wires 67 between the motor 7 and switch 64 and wires 68 between the motor 7 and the battery contact 69. When the circuit is closed by the switch 64, the motor 7 operates by electricity from the battery 17.

In a preferred operation of this invention, the control module 24 is electrically connected to the heating pad 19 by cord 53 and electrically connected to the vibrator by cord 13 which is plugged into a jack socket 42 on the control module 24 with jack plug 44.

5 The heating pad 19 is then wrapped around the part of the anatomy to be treated and then held in place by the belt 20 which is buckled by inserting the male locking piece 21 into the female receptacle piece 23. The vibrator is then placed on the velcro loop strip fasteners 45 at the desired location. Electric power is then supplied to
10 the control module 24 by plugging the power cord 25 into an electric outlet, not shown. The slide switch 27 is then turned to the appropriate control position causing the heating coil in the heating pad 19 to get warm and the vibrator motor 7 to vibrate. This causes the vibration plate 5 to vibrate against the heating pad 19 with the result
15 that the vibration is transmitted to the anatomy.

 In other embodiments of this invention, both vibrator and heating pad can be connected to the control module by jack connectors. Also the control module can be connected to two vibrators, two heating pads or other combinations of electric appliances, e.g., a toaster and an
20 electric frying pan, a vibrator and a heated foot bath.

 The operation of the vibrator of this invention with reference to a vibrating heating pad is illustrative of the many other uses which can be made of the vibrator. It is not intended that the invention be limited to use with a heating pad.

25 If desired, the vibrator can be placed against the body or on clothes or a blanket on the body without use of a heating pad or control module. It can also operate by directly plugging into a power source or using batteries, without the need for a control module.



Claims:

1. A vibrating electric heating pad comprising:

an electric vibrator physically attached to said heating pad by means of detachable fasteners; and electrically connected by wires to a control module; said electric vibrator comprising a housing having therein a rotary motor with an eccentric weight on its shaft, said motor being attached to a vibration plate protruding through an opening in the base of the housing; said vibration plate suspended in said housing by a resilient mounting; said control module electrically connected to said vibrator and said heating pad for controlling the heating pad heating elements and the motor in the vibrator, said control module comprising a housing having therein a transformer/rectifier; a slide control switch and a jack socket for receiving said wires from said vibrator, a wire connected to said heating pad; and a main power cord for plugging into an electric power source.

2. The pad of claim 1 wherein the resilient mounting in the vibrator is a foam cushion.

3. The pad of claim 1 or 2 wherein the detachable fasteners are hook and loop fasteners.

4. The pad of claim 1, 2 or 3 wherein said heating pad has a belt and locking buckle for holding said heating pad on the body.



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5. The pad of claim 1, 2, 3 or 4 which also contains a radio frequency filter electrically connected to said sliding switch and said transformer/rectifier.

6. A portable electric vibrator comprising a housing having therein a rotary motor with an eccentric weight on its shaft, said motor attached to a vibration plate protruding through an opening in the base of the housing, said vibration plate suspended in said housing by a resilient mounting, and a means for connecting said motor to an electric power source.

7. The vibrator of claim 6 wherein said resilient mounting is a foam cushion.

8. The vibrator of claim 6 or 7 wherein the means for connecting to an electric power source is a jack plug for plugging into a control module.

9. The vibrator of claim 6 or 7 wherein the means for connecting to an electric power source is a cord with a plug for plugging into an electrical power outlet.

10. The vibrator of claim 6, 7, 8 or 9 wherein the electric power source is a battery wherein said battery is inside said housing.



11. A pad as claimed in claim 1 substantially as described with reference to any Figure(s) of the accompanying drawings.

12. A vibrator as claimed in claim 6 substantially as described with reference to any Figure(s) of the accompanying drawings.