Sept. 16, 1969 S. L. McNAIR 3,467,080

COMBINED HEATING AND MASSAGING DEVICE

Filed Aug. 1, 1966

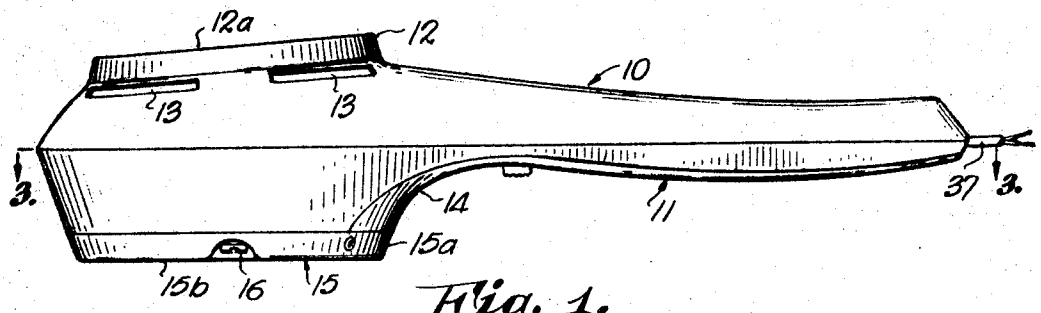


Fig. 1.

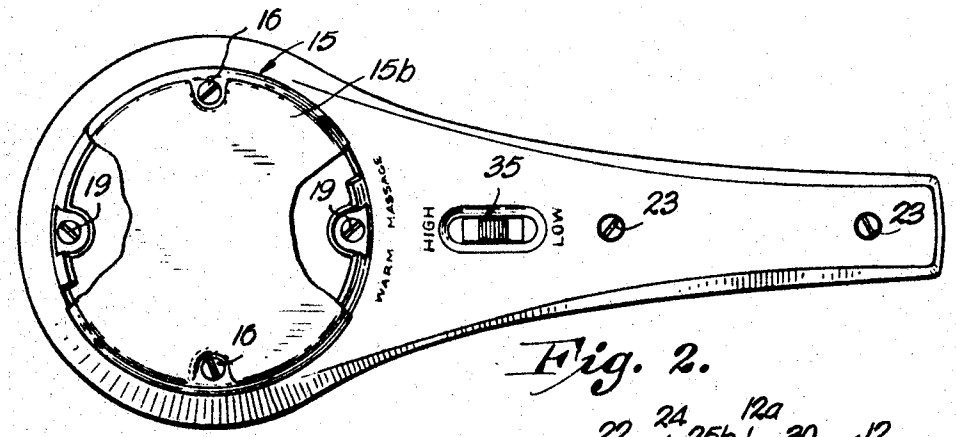


Fig. 2.

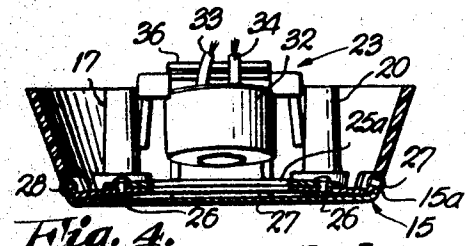


Fig. 4.

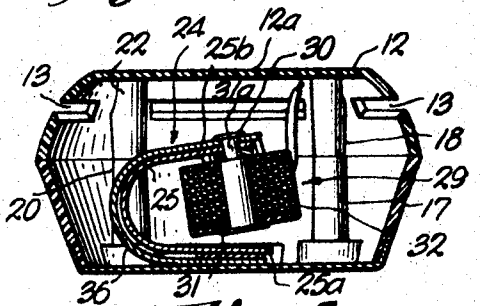


Fig. 5.

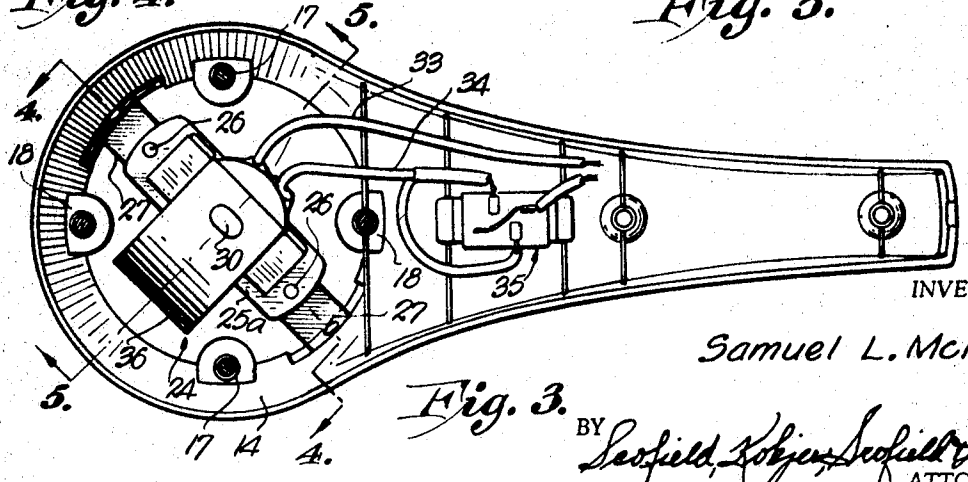


Fig. 3.

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COMBINED HEATING AND MASSAGING DEVICE

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ABSTRACT OF THE DISCLOSURE

A heat generating electromagnet is supported for vibration on the free end of a leaf spring and means are provided for conducting heat from the electromagnet to a heat conductive applicator surface which is also subject to the vibrations of the electromagnet so as to provide vibration combined with heat.

This invention relates generally to vibrating devices for physical care and therapy and refers more particularly to a vibrating device capable of providing both vibration and infrared heat radiations for such purposes.

Combined heating and vibrating or massaging devices are known. In all such devices of which I am aware the heat has been supplied through an electric resistance heating element which is separate and apart from the vibrating mechanism, although both may be contained in the same case and are controlled by separate switches so that a selection of heat plus massage or massage alone may be had.

One of the main objects of the present invention is to provide a combined heating applicator and massage device in which the heat is obtained from the electric vibrating means and the necessity of providing a separate heating element is done away with. As a result, my device can be constructed of fewer parts than other devices of which I am aware and thus made available to the public at a lower cost.

Another important object of the invention is to provide a combined heat applicator and massage device in which the user can, despite the continuous heating function served by the electric vibrating means, select at will the application of heat and vibration together or vibration alone.

Other and further objects of the invention, together with the features of novelty appurtenant thereto will appear in the course of the following description.

In the accompanying drawing, which forms a part of the specification and is to be read in conjunction therewith, and in which like reference numerals indicate like parts in the various views;

FIG. 1 is a side elevational view of a preferred form of combined heat application and massage device embodying the invention;

FIG. 2 is a bottom plan view of same, parts being broken away for purposes of illustration;

FIG. 3 is a plan view of the lower half of the casing and the components mounted therein, the view being taken generally along line 3—3 of FIG. 1 of the drawing;

FIG. 4 is a sectional view taken generally along line 4—4 of FIG. 3 in the direction of the arrows; and

FIG. 5 is a sectional view taken generally along line 5—5 of FIG. 3, but with the top half of the casing in place.

Referring to the drawings, in the preferred form of the invention the main body comprises a hollow housing made up of upper and lower shell-like members **10**, **11** which have edges which register with one another on a substantially horizontal plane through the center of the unit. Both the upper and lower shells may be molded from any suitable plastic. The upper shell is formed with a circular boss portion **12** providing a planar circular surface **12***a* on the forward top side of the unit. Immediately below this boss and spaced around the shell are openings **13** which provide ventilation to the interior of the housing.

The lower shell **11** of the housing terminates also in a generally circular boss **14** but in this case the lower end of the boss is open and the opening is covered by a circumferentially flanged member **15** of circular configuration which has the flange **15***a* and the bottom planar portion **15***b*. For reasons later described, member **15** is made of material having good heat conductivity, and preferably aluminum.

The member **15** is secured to the housing by means of screws **16** which extend upwardly through recessed portions in the plate member **15** at opposite sides thereof through internal passages in bosses **17** formed on the inside of the lower shell **11** and are threaded into similar bosses **18** formed within the upper shell in order to secure the shells together as well as hold the plate member **15** thereto. A similar pair of screws **19** received in bosses **20** in the lower shell are threaded into bosses **22** in the upper shell. The screws **19** and their corresponding bosses **20**, **22** are disposed at 90° from the screws **16** and the heads of the screws **19** are concealed by the plate member **15**.

The housing is formed with a handle portion as can be seen in FIGS. 1 and 2, and screws **23** serve in similar manner to screws **16** and **19** to join the handle portions of the mating shells together.

The vibratory energy for the massage function of the device is supplied by a vibrator motor **24** which includes a U-shaped magnetically permeable spring **25**. The lower leg of spring **25** is formed with a generally T-shaped head **25***a* which is riveted as at **26** to a cross bar **27**, also of magnetic material, extending diametrically across the inside of the plate member **15** and riveted to flange **15***a* by rivets **28** at the opposite ends of the cross bar. The upper leg of the U-shaped member overlies but is spaced well above the lower leg.

An electromagnet shown generally at **29** is mounted on the inside of upper leg **25***b* by a rivet type connection **30**. The electromagnet creates an alternating magnetic field which cooperates with each leg and the bend therebetween to transmit vibratory energy through the cross bar **27** to the plate and housing.

The electromagnet **29** includes a central core **31** which has an extension **31***a* of reduced diameter at its upper end. The end of the extension is flattened or headed to form the rivet connection **30** to the upper leg **25***b*. For exemplary purposes, I have shown cores **31** as cylindrical; however it may have other cross sections. The core **31** is constructed of a non-laminated magnetically permeable metal. An exciting coil **32** circumscribes the core **31**. The coil is wound within a plastic bobbin which extends to the upper end of the core. The coil is energized by alternating current supplied through electric leads **33**, **34** and input is controlled by a switch **35** later to be described. An additional part of the electromagnet **29** comprises the inverted U-shaped bar member **36** having the legs **36***a* on opposite sides of the core. This member is mounted on the reduced or necked down upper end **31***a* of the core and is also held in place by the hot-heading or rivet effect which serves to secure the core to the spring **25**.

Positioned adjacent the U-shaped spring **25** and of generally similar configuration is a heat transfer member **36**. The heat transfer member may supplement the spring, but it also may be freely flexible. Its primary requirement is that it be constructed of a metal having extremely good properties of heat conductivity, such as aluminum. The heat transfer member **36** is riveted at its upper end to

the extension line 31*a* of the core by the headed connection 30 earlier described and its lower end passes beneath and is held firmly against the inside of plate member 15 by the cross strap 27.

The switch 35 earlier described is a three position switch having an "off," high and low position supplying lesser power to the vibrator than in the high position. The switch is connected with the leads to the vibrator and to the electric cord 38 which is conventional and includes a plug for a wall jack (not shown).

In operation, when the vibrator motor 23 is energized by moving the switch to the high or low position, it is set in motion through the combination of alternating magnetic fields and the reaction thereof with the magnetic base components of the spring 25 and strap 27. As the core 31 is not laminated, it is not able to compensate for the eddy current loss accompanying the rapid flux change. The losses are converted to heat and this heat is conducted from the core through the extension 31 to the heat transfer member 36 and thereby to the plate member 15 which also being of good conductivity, tends to distribute the heat uniformly to all parts thereof. Thus heat is generated in the plate member by the motor while the motor is vibrating.

One desiring both application of vibratory energy and heat to a portion of the body simply places the plate 15 in contact with the desired area of the body while the unit is operating.

In the event the user desires application of vibratory energy for massage without application of heat, it is necessary only to turn the unit upside down and apply the surface 12*a* to the desired part of the body rather than the plate 15.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a combined heat applicator and vibrator, the combination of

a support member having an applicator portion thereon constructed of a substance having good heat conductivity,

a U-shaped spring member mounted to said support member with one leg adjacent said applicator portion, the other spaced therefrom,

an electromagnet mounted on said other leg of said spring member, said electromagnet including a core constructed to produce substantial heat in response to alternating current applied to said electromagnet, and

heat transfer means in heat transfer relationship between said core and said portion of said support member and operable to transfer heat from said core to said applicator portion whereby to heat said portion while said electromagnet is energized.

2. The combination as in claim 1,

said support member including a second applicator portion remote from the first-named applicator portion.

3. The combination as in claim 1,

said heat transfer means comprising a U-shaped member similar to said spring having one leg connected with said core and the other contacting said applicator portion.

4. The combination as in claim 1,

said support member comprising a hollow housing having a handle portion and a head section,

one side of said head section being said applicator portion.

5. The combination as in claim 4,

said head section having a side opposite said applicator portion.

6. The combination as in claim 1,

said applicator portion comprising a metal plate secured to said support member.

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L. W. TRAPP, Primary Examiner

U.S. Cl. X.R.

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