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2,288,232

ELECTRIC HEATING PAD

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Fig. 1

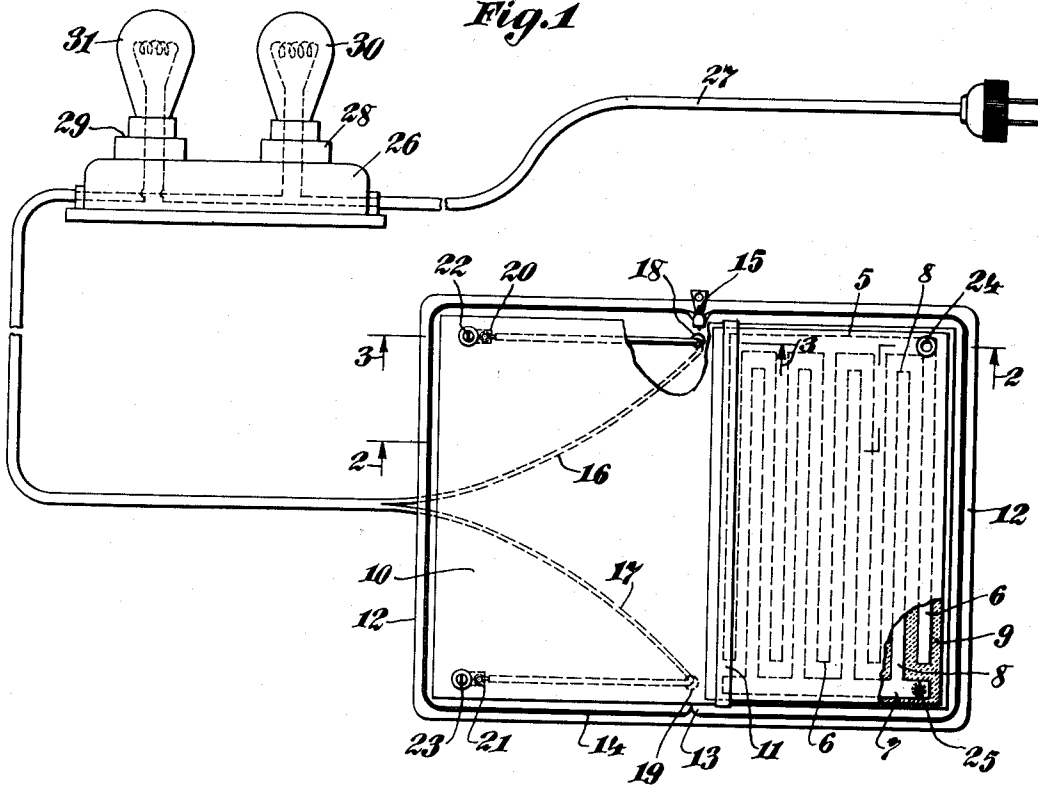


Fig. 2

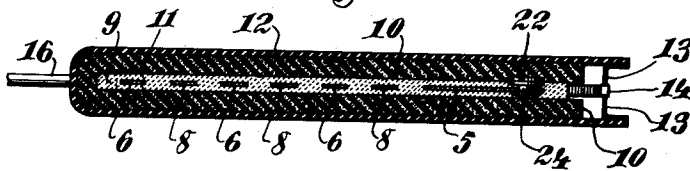


Fig. 3

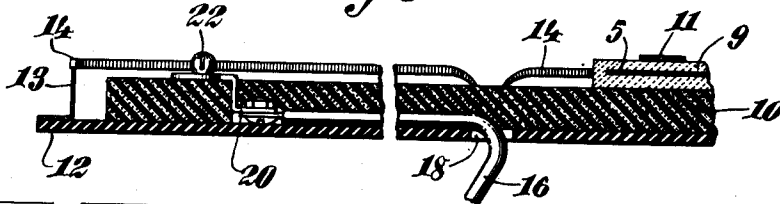
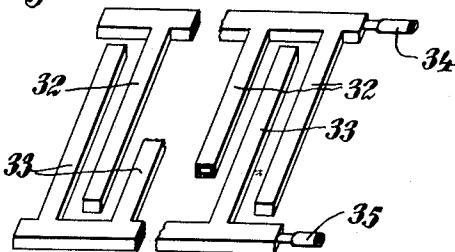


Fig. 4



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ELECTRIC HEATING PAD

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8 Claims. (Cl. 219-46)

The invention here disclosed relates to heating pads, such as employed for diathermic purposes.

Objects of the invention are to provide a pad of this general type, which will provide the desirable characteristics of a moist, as distinct from a dry heat, which will be variously controllable to suit the requirements or comfort of a patient and which will be entirely safe and practical in every way.

Other desirable objects and the novel features by which the purposes of the invention are attained will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates one of the present commercial embodiments of the invention. Structure however may be modified and changed as regards the present disclosure, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 is a broken and part sectional view showing one of the pads and the manner in which it may be connected for use, the pad being shown in the open, inoperative condition.

Fig. 2 is an enlarged cross-sectional view of the pad in the closed operative condition, taken as on the line 2-2 of Fig. 1.

Fig. 3 is a broken and further enlarged cross-sectional detail as on line 3-3 of Fig. 1.

Fig. 4 is a broken sectional detail of a modified form of the invention.

In the present invention, the principle covered by the Driscoll Patent 1,943,062, Jan. 9, 1934, is utilized by incorporating relatively insulated conductors of opposite polarity in a pad formation which can be moistened as required to afford a desired degree of heat producing conductivity between the conductors.

In Fig. 1, the opposite conductors are shown in the form of two spaced grids, one composed of a bus bar 5, and branches 6, and the other a bus bar 7, and branches 8, and arranged with the branches in spaced alternating order, held so by a surrounding and enclosing pad 9, of absorbent normal insulating material, such as asbestos.

This absorbent pad with embedded conductors is shown as located and removably retained in position over approximately one-half of a foldable base pad 10, of suitable insulating absorbent material, such as sponge rubber.

The means for so locating and retaining the absorbent grid pad on the foldable base pad is shown as an overstanding strap 11, of elastic material beneath which the grid pad may be slipped.

The two pads are shown as mounted in a foldable case 12, composed of flexible, water-proof and insulating material, such as rubber or rubberized fabric and having a continuous edge

flange 13, carrying cooperable fasteners 14, engageable and disengageable by the slider 15.

The electrical connections may vary, but a preferred arrangement is shown in Fig. 1, in which the wires 16, 17, are led separately through openings 18, 19, in the back of the folder to terminals 20, 21, on the back of the folding pad, said wire terminals being connected with or forming part of contacts 22, 23, engageable respectively with companion grid terminals 24, 25.

The companion engaging contacts 22, 24, and 23, 25, may be of the spring engaging glove fastener type, so as to insure good contact and at the same time serve as fasteners for securing the folding pad closed over the grid pad as in Fig. 2.

This construction operates as a safety switch, insuring that the base pad be folded closed over the grid pad before the circuit is closed to the opposed, cooperable heater grids.

The foldable base pad may be adhesively or otherwise attached at the back to the folding case, so that the latter may be opened and closed like a book, to open or to close the heating circuit to the grids.

By using the slide fastener, the folder may be entirely closed, to prevent accidental opening of the circuit at the snap fastener contacts. This closing of the folder about the edges of the pads also serves to retain the heat generated by the flow of current through the moistened absorbent medium between the grids.

The rate of heating and total heat may be governed by the extent to which the insulating-when-dry medium separating the opposed grids is moistened. With more wetting, the heating will be faster and sensible heat generated will be greater than when the absorbent material is wetted, for instance, only enough to make it conductive.

The moisture usually may be applied directly to the absorbent grid pad, when the folder is in the open condition, shown in Fig. 1, and therefore before there are any electrical connections to that pad.

As a further safety precaution, some form of current limiting means are preferably interposed in the supply circuit leading to the pad.

In the example illustrated, a table supported base 26, is interposed in the supply cord circuit 27, said base carrying two lamp sockets 28, 29, one in each side of the line to take lamps 30, 31, fuses or the like.

This double socket form of construction is particularly desirable in enabling the use of different combinations, such as for instance, a current limiting lamp in one side of the line and a protective fuse or the like, in the other side of the line.

The grid pads are readily removable and re-

placeable, thus enabling quick substitution of a fresh pad or a pad of different absorptive or electrical characteristics. Grids of different forms will provide different heating characteristics. Thus heating units of different operating characteristics can be readily substituted and used in the same holder or folder. The individual may control the heating effects by moistening the absorbent grid pad to different extents and by the use of different size lamps and in one or both sides of the line, and the like.

The asbestos or other insulating-when-dry absorbent medium may be in a fibrous, matted, felted, twisted or woven state and may be wrapped, molded, or otherwise placed about and secured over the companion grids.

The grids may be stamped out of thin flat sheet metal, so that the pad when made up will be sufficiently light and flexible.

If desired, the grids may be of tubular form and moisture be supplied therein, said grids then having suitable openings for escape of the moisture into the surrounding material of the absorbent pad. The moisture may be supplied by liquid or connections may be made to supply steam into such hollow grids.

In Fig. 4, grids of tubular form are illustrated at 32, 33, having suitable liquid or moisture supply connections thereto at 34, 35.

The lamp form of current control illustrated may be desirable, because of the visual indication thereby provided of the amount of current, or the presence or absence of any current in the pad, but it is contemplated that any other form of control may be employed, such for example, as the adjustable resistance switches employed in connection with ordinary heating pads.

What is claimed is:

1. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad and including a folder and circuit completing means for said pad carried by said folder and cooperable to carry current to said conductors only when the folder is closed.

2. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad and including a folder and a flexible foldable base pad in said folder and supporting said absorbent pad, said folder having a flange about the edge of the same for positioning and retaining said foldable base pad in either the open or the folded condition of said folder and base pad and means for securing said flange closed together about the base pad when the folder and the base pad are in the closed folded condition.

3. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad and including a folder, a flexible foldable base pad in said folder and supporting said absorbent pad, terminal means

on said absorbent pad for the conductors enclosed therein and cooperable terminal means on said foldable pad, said cooperable terminal means being positioned on said foldable pad to engage and carry current to the terminal means on said absorbent pad only when said foldable pad is folded about said absorbent pad.

4. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad and including a folder, electrical terminals on said folder and companion terminals on the absorbent pad engageable by said first terminals only when the folder is closed.

5. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad, including a folder and a foldable base pad of sponge rubber in said folder and supporting and foldable about said absorbent pad.

6. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad and including a folder, electric terminals on the inside of said folder, wires extending through the back of said folder to said terminals and companion terminals on the absorbent pad engageable by said first mentioned terminals when the folder is closed.

7. An electric heating pad, comprising a flexible pad of absorbent material, flexible conductors of opposite polarity confined in opposed spaced relation by the absorbent material of said pad and which material is electrically insulative-when-dry and conductive when wet, a flexible enclosure about said pad and including a folder, electric terminals on the inside of said folder, wires extending through the back of said folder to said terminals, companion terminals on the absorbent pad engageable by said first mentioned terminals when the folder is closed and electrical connections to said conductors, including circuit wires and a double socket base interposed in said circuit wires and connected with one socket in one side of the line and the other socket in the other side of the line.

8. An electric heating pad, comprising opposed hollow perforate conductors of opposite polarity embedded in a flexible pad of absorbent material which is normally a conductor when dry and is conductive to electric current when wet, said conductors being of tubular formation and having moisture escape openings in the embedded portions of the same for conducting moisture into the surrounding material of the pad and tubular supply connections for conducting moisture furnishing medium to said absorbent material, through the means of said tubular conductors and thereby to control conductivity between the conductors while said electric heating pad is in service.

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