April 9, 1929. J. H. DEQUER 1,708,875

THERAPEUTIC BLANKET OR THE LIKE

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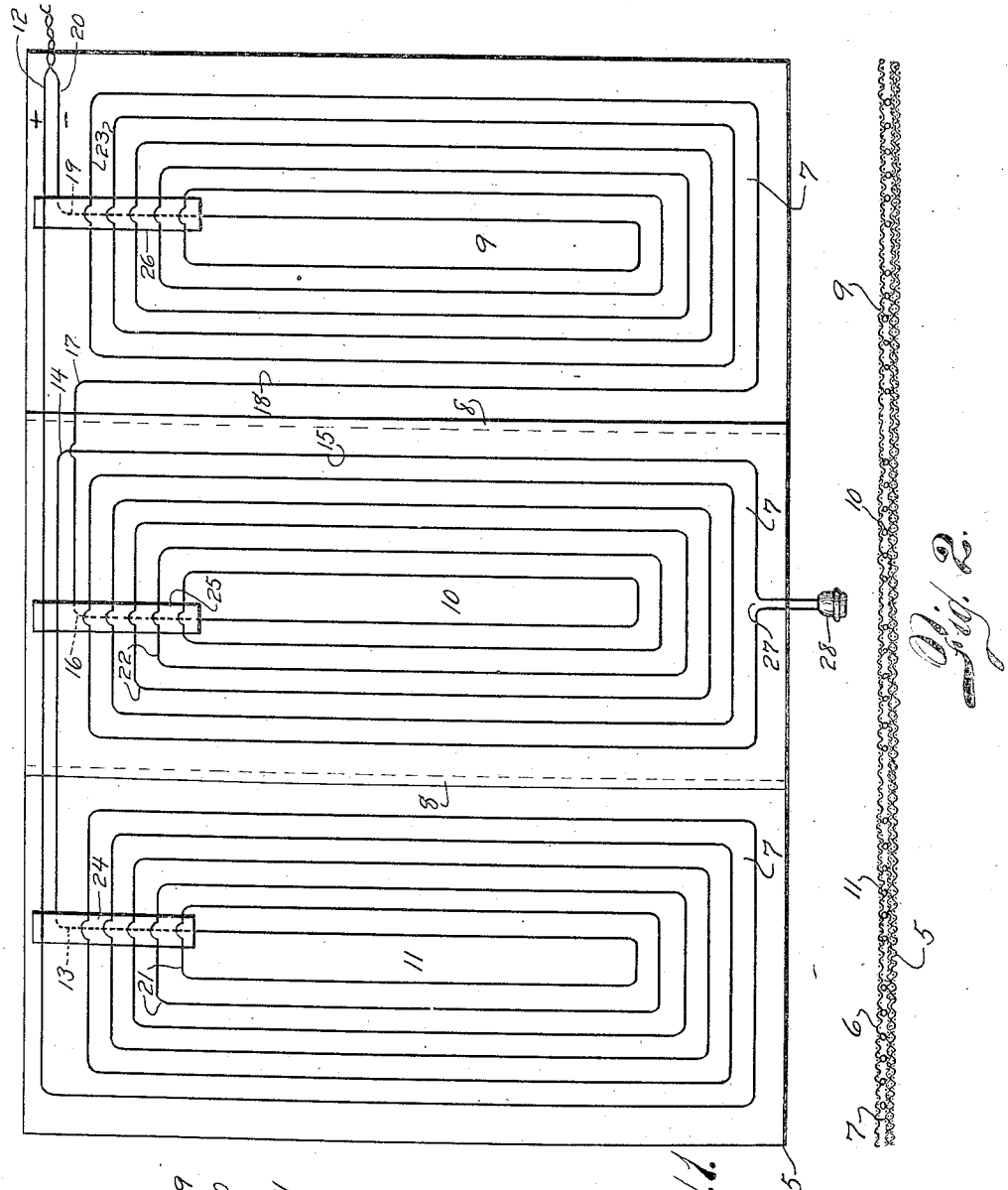


Fig. 2.

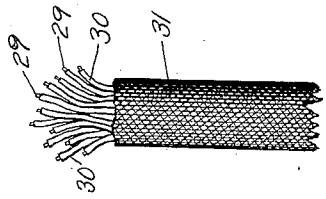


Fig. 3.

Fig. 1.

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UNITED STATES PATENT OFFICE.

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THERAPEUTIC BLANKET OR THE LIKE.

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This invention relates to improvements in therapeutic blankets or the like, which embody a flexible non-conducting base that supports plurally coiled electrical conductors, or insulated copper wires, for connection in circuit with a suitable electrical current, such as the alternating current usually supplied for lighting and other purposes, which said equipped devices, whether or not they actually be blankets, robes, suitings, bandages, pads, hoods, masks, gauntlets, stockings, or otherwise, to any of which my invention will apply although I shall only disclose the invention particularly with reference to blankets, function with very valuable therapeutic results, as is now well understood, in the treatment of numerous ailments of the human organism.

With such devices as aforementioned, it has heretofore been proposed to arrange such a plural number of insulated copper wires turned in coils on the base support of the blanket, or its equivalent, with the coils as a unit at all times connected in series, in some instances, and in other instances with the coils not so permanently connected in series, being arranged to be switched into a series circuit, whereby one or more of the coils may have the current of electricity traverse them to either moderate or increase the desired intensity of the treatment.

The foregoing object as well as other objects, features and advantages of the present improvements, however, will be clearly apparent, it is believed, as incidental to the following disclosure, so that with these general outlining remarks reference will now be immediately had to the accompanying drawings, illustrating a practical embodiment of the improvements, in which drawings

Figure 1 is a top plan view of the improved blanket, or its equivalent, with its upper lining removed to show the disposition of the covolutions of the coil units; Figure 2 is a longitudinal sectional view through the blanket structure as a whole; and Figure 3 is a fragmentary view, on a very large scale, illustrating a preferred construction of the electrical conducting means, forming the coils and wiring of the blanket, which conducting means is preferably in the form of a cable of fine, soft, individually moisture-proof insulated copper wires, which are collectively contained within the usual, or any special, covering of insulating fabric or material.

The blanket as a whole may of course be of any suitable dimensions, a convenient size being say six feet by six feet and six inches, and is in the nature of a large quilt, or freely flexile fabric body, preferably of three-layer construction.

The outer covering or bottom layer 5 may be in the nature of robe cloth or the like, the inner covering or top layer 6 may be satin lining or other suitable finishing material, and the intermediate layer 7, or surmounting base for the attachment of the coils and the lead-in and lead-out copper wire cables, being preferably of heavy duck or equivalent material.

The intermediate layer 7, or duck base support, is illustrated at Fig. 1 as being formed in three sections or panels, with the longitudinal edge face portions of the central section slightly overlapping and suitably stitched to the longitudinal inner edge face portions of the outer sections, as would be indicated at 8; but for convenience in folding the blanket, in endwise manner, it is obvious that the contiguous longitudinal edge face portions of the duck sections could be held together by attachment to interposed laterally disposed strips of webbing, which would provide for flexible hinge-like connections, between the adjacently disposed sections, substantially along the positions 8.

A sufficient margin is left all around the blanket, substantially outside of the wiring zone, to allow for the outer edge face portions of the layer 5 to be turned over inwardly to meet the outer edge face portions of the inner layer 6, whereby these edge portions may be hemmed together by stitching passing also through the outer edge face portions of the intermediate layer 7, encased therebetween, with a neatly finished margin.

It is perhaps possible that two coil units might suffice, or that even a greater number than three coil units might be employed, but so far I have found that the employment of three coil units appears to be more practical and from which I have obtained most satisfactory results. In the drawings, therefore, I have illustrated a tri-coil arrangement.

The said coil units are indicated at 9, 10

and 11, each of which being mounted on its respective section of the intermediate layer 7 of the duck material, and the convolutions thereof are preferably stitched to the duck base support, or securely attached thereto in any other suitable manner, although such stitching or securing means is not actually shown in the schematic drawings, as this feature will be obvious. It may also be said here that it would likewise be an obvious equivalent to fasten together the outer edge face portions of the layers 5, 6 and 7 by other means than the marginal stitching before referred to, as for instance by marginal fasteners of the snap socket type, such as employed as glove fasteners.

While the coil units are coupled up in series, it is to be particularly noted, however, that the convolutions of each successive coil unit are reversely turned or wound relatively to the disposition of those of the preceding coil unit. For instance, in the tri-coil arrangement illustrated, the central or intermediate coil unit 10 has its convolutions turned or wound right-handed, while its adjacent or the end coil units 9 and 11 have their convolutions wound in a reversed or left-handed manner.

The lead-in conduit 12 is shown on the drawings as running to the far coil unit 11, the outlet line of the coil unit 11 extending as at 13—14 and being connected to the inlet line 15 of the next successive coil unit 10. The outlet line of the coil unit 10 extends as at 16—17 and is connected to the inlet line 18 of the next successive coil unit 9, the outlet line of the coil unit 9 extending as at 19 for connection with the lead-out conduit 20.

For convenience in the sewing or stitching attachment operations, the outlet lines 13—16—19 may preferably be disposed underneath the end turns 21—22—23 of the respective coil units, and it may also be desirable, as shown, to provide short pieces of narrow tape or the like, as at 24—25—26, which extend beneath said end turns of the coil units and above said outlet line ends thereof.

It is also to be noted that one of the convolutions of one of the coil units may be broken or interrupted, for the purpose of providing means for the coupling in of auxiliary therapeutic appliances in the blanket circuit, which appliances, however, form the subject-matter of separately claimed inventions.

In the drawings, therefore, one of the end turns of the central coil unit 10 is shown with short branch outlet lines, leading from the coil as at 27 and connected at their outer ends with the terminal posts of one section 28 of a plug socket coupling. When the blanket is to be used with one of said auxiliary appliances, a coupling section of the latter is plugged into the element 28 of the blanket, for completing a circuit through the blanket coils and the coils of the appliance, the blanket coils functioning additionally as a resistance means for the said appliance. When such an appliance is not to be used, however, then an individual coupling section, not shown but forming a part of the blanket equipment, is plugged into the element 28, for completing the circuit through the blanket coils. Also, the ends 12 and 20 of the lead-in and lead-out conduits are in connection with the terminal posts of one half of a plug socket coupling, the other half of which is connected with a lamp cord for attachment to a current supply socket of an electric light fixture or the like, and the lamp cord being provided with a switch element in convenient reach of the user of the blanket, although none of these details are illustrated as they are obvious and well known equipment features.

Also it may be stated that, although at Figure 1 the wiring of the blanket is shown as being integrally continuous as a matter of fact separate connections may be made between lengths thereof at the positions 12, 14, 17, 20 and 27. This would allow for the separate stitching down of the coils of each coil unit upon their respective supporting base sections of the duck layer 7, before the sections are secured together, leaving substantially projecting ends of the coils for final connection in circuit. A very satisfactory way of making such connections, at these positions, affording reinforcing means against disruption when folding the blanket, is to twist together the bared and cleanly scraped adjacent end portions of complementary wires for a distance of about a couple of inches with the ends disposed in the same direction, preferably soldering these portions, then spirally covering said bared end portions with insulating adhesive tape, and finally winding the slack insulated portions of both sections of the wires conjointly and tautly around said adhesive tape covering.

With reference to the wiring of the blanket, a moderated heat is desired and, therefore, the conductor for the electric current should be of relatively low resistance. Otherwise, owing to the length of the conductor required, the heat generated would be so intense as to ignite any fabric that might be satisfactorily used in the make up of the blanket.

As shown greatly enlarged at Figure 3, therefore, although variations might be expedient with different makes of blankets, the wiring should preferably be in the form of a miniature cable consisting of approximately twelve to twenty fine strands of soft copper wire 29, each of which is separately or individually insulated with a moisture proof material, such as a thin coating 30 of a suitable enamel, and the whole completely over-

spun or encased with a double cotton or silk insulation covering 31. The wires may be of the same gauge or they could be of slightly varying fine dimensions in cross-section, and it may be preferable to have each strand disposed substantially parallel with the others, that is to say neither twisted around nor interwoven as it were. The functioning of the separate enameling of the individual wires, and which is a very important feature especially in continued usage, is to avoid the possibility of short circuiting the electric current through the body of the patient, owing to moisture saturating the outer covering of the cable 31 from the perspiration of the patient, thus safeguarding the patient from electrical shocks and at the same time insuring a minimum amount of heat required to suitably superinduce proper elimination through the pores of the skin by an appropriate amount of free perspiration.

From the foregoing complete description, it is believed that the objects, advantages and functioning of the improved equipment will be clearly apparent.

Although I have thus made a complete disclosure of the improvements, it will nevertheless be understood that I do not wish to unnecessarily limit myself to all of the details exactly as shown and described, as minor alterations may be made without departing from the gist of the invention, excepting as they may come within the terms of the claims, or equivalent arrangements or combinations of elements, or as when fairly interpreted in the light of the specification if necessary.

What I do claim, as new and patentable, is:—

1. In therapeutic blankets or the like, a suitable base support and a plurality of coil units disposed flatwise thereon, the said coil units being formed of miniature cable construction embodying individually moisture-proof-insulated fine low resistance wires encased as a whole in lengthwise relation by an insulation covering.

2. In therapeutic blankets or the like, a fabric base support with a plurality of coil units disposed flatwise thereon in a serially connected manner and adapted for the completion of an electric circuit therethrough, the said coil units being formed of miniature cable construction embodying individually enameled fine low resistance wires encased in lengthwise relation by an insulation covering, a fabric outer covering for said base support, and an inner lining therefor.

3. In therapeutic blankets or the like, a fabric base support with a plurality of coil units disposed flatwise thereon in a serially connected manner and adapted for the completion of an electric circuit therethrough, the said coil units being formed of miniature cable construction embodying individually enameled fine low resistance wires, for separate moisture-proof insulation, encased in lengthwise relation by an insulation covering, and with a convolution of one of said coil units being broken and provided with a coupling element for the plugging in of an auxiliary heating appliance or other circuit closing means, a fabric outer covering for said base support, and a lining for covering the inner face of said base support and its coil units equipment.

4. In therapeutic blankets or the like, the combination of a base support and a plurality of coil units carried thereby in a serially connected manner for the completion of an electrical circuit therethrough, the said coil units being formed of moisture-proof-insulated low resistance conducting means.

5. In therapeutic blankets or the like, the combination of an elongated flexible base support and means carried thereby for applying a moderated heat to the body of the user, without passing electric currents through the body of the user, which means embody a plurality of coil units so turned flatwise upon said support, in a serially connected manner for the completion of an electrical circuit therethrough, that each of said coil units encompasses approximately the entire lateral area of said base support in its own zone, the said coil units being formed of suitably insulated electrical conducting means.

6. In therapeutic blankets or the like, the combination of an elongated flexible base support, a plurality of coil units, formed of moisture-proof-insulated low resistance conducting means, so disposed in flatwise relation thereon, in a serially connected manner for the completion of an electrical circuit therethrough, that each of said coil units encompasses approximately the entire lateral area of said base support in its own zone, with a convolution of one of said coil units being broken and provided with a coupling element for the plugging-in of an auxiliary appliance or other circuit closing means, and an inner lining for said base support which covers its coil units equipment.

In testimony whereof, I affix my signature.

JOHN H. DEQUER.