Improvements in electro thermal garments for therapeutic purposes.

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COMPLETE SPECIFICATION.

Improvements in Electro Thermal Garments for Therapeutic Purposes.

I, Burton Robert Charles, of Portland, State of Oregon, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to electro thermal garments of that class which are designed to be used for confining the heat generated by an electric current to the body for therapeutic purposes and comprising a series of surfaces to which are secured electric heating wires or resistances which may consist of compositely wound strands provided with waterproof and fireproof insulating coatings. One of the objects of my invention is to provide a novel form of insulation for such wires in which the primary coating of insulation on the fine strands constituting the core of the wire is wound spaced apart and impregnated with a solution consisting of approximately equal parts of soluble silicate and glycerine.

The invention further comprises the attachment of the electric heating wires by zig-zag stitching to a separate attachable strip of woven gauze-like material such as cambric, since such material accommodates the displacement of the wires during the creasing or folding of the garment, without imposing any strain on the stitching threads, for the threads of the cambric accommodate the slight displacement of the stitching threads, under the circumstances referred to.

In the drawings,

Figure 1 represents a garment provided in parts with mats of wire, and provided with terminals adapted to be connected with a socket installed in an electric house circuit;

Figure 2 is an enlarged detail of a portion of the cambric or gauze-like material, to which the electric heating wires are sewn.

Figure 3 is a diagrammatic detail, illustrating the steps in the process of making the electric heating wires used by me in the construction of heating mats.

Figures 4 and 5 are enlarged details of portions of the garment provided with pockets, in which the terminals of the electric wiring of the garment are concealed; and

Figure 6 is a detail of the slipper attachment with which the garment is provided.

The wire, *a*, is arranged in the form of continuous parallel strands and sewn to the front face of a base strip of cambric, *b*, or other gauze-like material by zig-zag stitching, *c*, and the base *b*, is sewn to the inner face of the material from which the garment is made.

The mats of wire, arranged as illustrated in Figure 2, are electrically connected in series with each other, and, finally, with the terminals arranged in the form of a cord, *d*, provided with a plug, *e*, adapted to have a cord *f*, attached thereto, which cord *f*, is provided with a plug *g* adapted to be inserted in the socket *h*, of an incandescent electric lamp. *i* is a switch arranged to enable one to turn the electric current, transmitted through the garment, on or off at will.

[*Price* 8*d*.]

The wires of the terminals *d* and of the switch *i* extend to the outside of the garment, through the material of the latter, at places where the garment is provided with pockets *j k*, which pockets are so arranged as to hold and conceal said terminal wires, so that the garment can be used for ordinary house purposes, when not required for therapeutic purposes.

The wire, *a*, is composite or stranded, being made of a plurality of fine strands, *l*, arranged parallelly, as shown in Figure 3, and insulated by a covering consisting of a plurality of cotton thread layers wound one over the other.

The primary coat *m*, is impregnated (preferably the thread thereof before winding around the composite wire) by immersing in a solution of heat-resisting chemicals, consisting of soluble silicate and glycerine in about equal parts. This treatment is for the purpose of rendering the primary insulation coat unaffected by the heating of the wire strands which it encloses. The primary insulating coat *m* is not spun close, but the strands thereof barely touch each other, and leave intermediate minute spaces. The glycerine in the solution adds adhesiveness to the primary thread and also serves to space the contiguous loops of strands from each other.

The second and third coats, *n*, *o*, are spun dry over the primary coat, successively, after such primary coat has been allowed to dry. The minute spaces between the successive loops of threads, caused by the drying of the solution impregnating the thread of the primary insulation, will serve to increase the flexibility of the latter, for it allows such contiguous loops to move closer together during the bending of the wire. The primary coat, *m*, thus alone comes into direct contact with the wire strands, *l*, and saves the second and third insulation coats from being scorched by the heating of the wire strands; and, on the other hand, the second and third coats protect the first coat from wear and serve as a final insulation.

After the mats, *b*, of the wires have been sewn to the inner face of the garment, as described, they are covered by the lining of the garment. The gauze-like cambric conserves the heat, as it were, that is, holds it on the interior of the garment and to the body of the wearer, and protects the material, out of which the garment is made, against any excessive heat, which is quite a factor, for it is known that fabrics becomes partially decomposed by direct exposure to excessive heat. It will be found that the outer face of the material of the garment will remain quite cool to the touch during the time that the heating current is turned on.

The arrangement of the mats of electric wires, as above described, causes the garment, when worn and enveloped about the body to become a form of magnetic helix, or solenoid, from which beneficial therapeutic effects may be obtained, if the electric current has the proper strength.

At the bottom of the garment I may provide a slipper-like foot-warming attachment, electrically heated by wires electrically connected with the wiring of the garment.

My foot-piece attachment consists of a sole, *p*, to which are secured slipper-like uppers, *q*, *q*, including side strips *r*, the whole having the general appearance of slippers. The attachment of the base strip or sole *p*, to the bottom of the garment is done preferably by sewing, so as to provide a sort of hinge-joint adapted to permit the foot-piece, when not to be used, to be turned up against the inside of the bottom of the garment, and there secured by a device like a glove-fastener, the two parts of which are secured, at *s*, *t*, on the sole and the garment, respectively, as shown.

When the foot-piece is to be used, the same will be dropped down, and after the robe has been wrapped around the person, and the patient has been seated, or has lain down, the feet will be inserted in the foot-piece, in the same manner as one would insert the feet in slippers. When so adjusted, the foot-piece will warm the feet, and thus promote and quicken the warming and therapeutical effects of the garment as a whole.

The wires are introduced in the foot-piece between the sole and the inner lining. The sole may be made of felt, and the inner lining made of a flannel-like material.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An electro-thermal garment of the class hereinbefore specified wherein the first of a plurality of insulating coats on the fine strands constituting the core of the electric heating wires is wound spaced apart substantially as and for the purpose described.

2. An electro-thermal garment, as in Claim 1, wherein the primary insulating coating is impregnated with a solution consisting of approximately equal parts of soluble silicate and glycerine.

3. An electro-thermal garment as defined in Claim 1 or 2 having the composite wire secured to a separate attachable base strip of gauze like material.

Dated this 6th day of September, 1909.

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Fig 1.

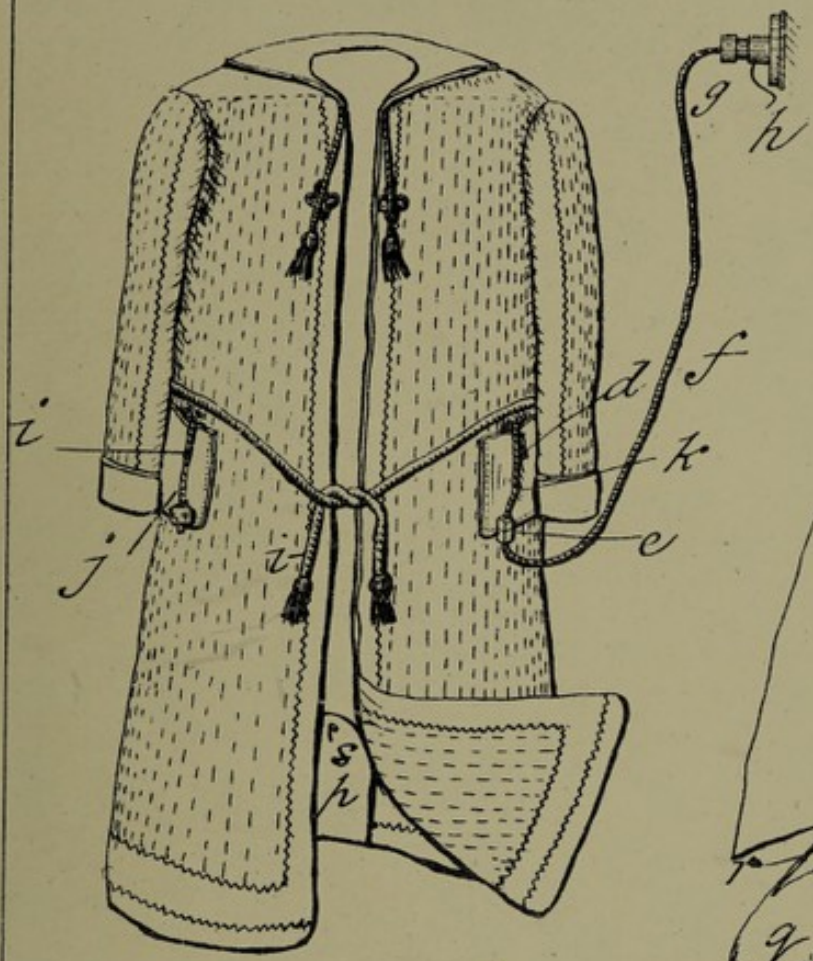
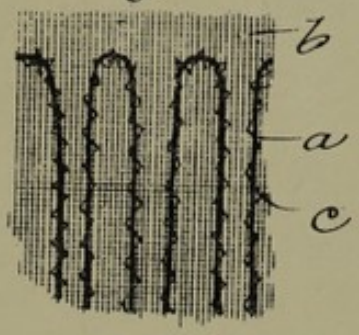


Fig 2



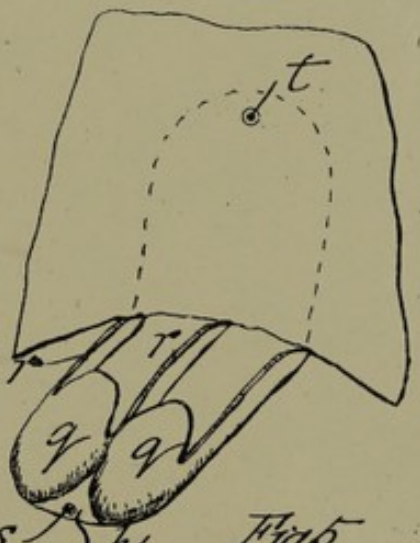


Fig 6

Fig 4

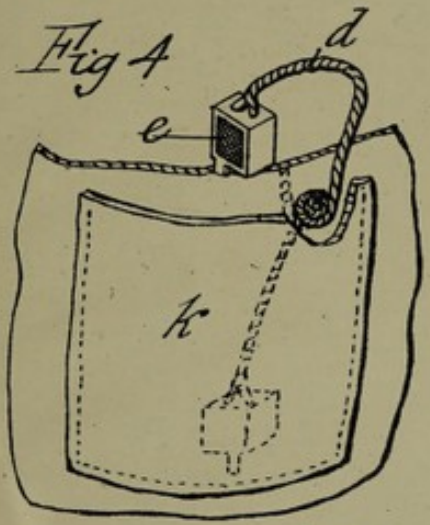


Fig 5

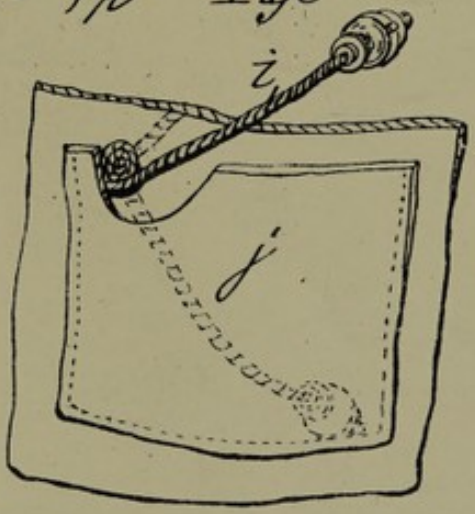


Fig 3

Malby & Sons, Photo-Litho