J. E. CRADDICK.

ELECTROTHERMAL GARMENT.

APPLICATION FILED APR. 3, 1919.

1,394,810.

Patented Oct. 25, 1921.

3 SHEETS—SHEET 1.

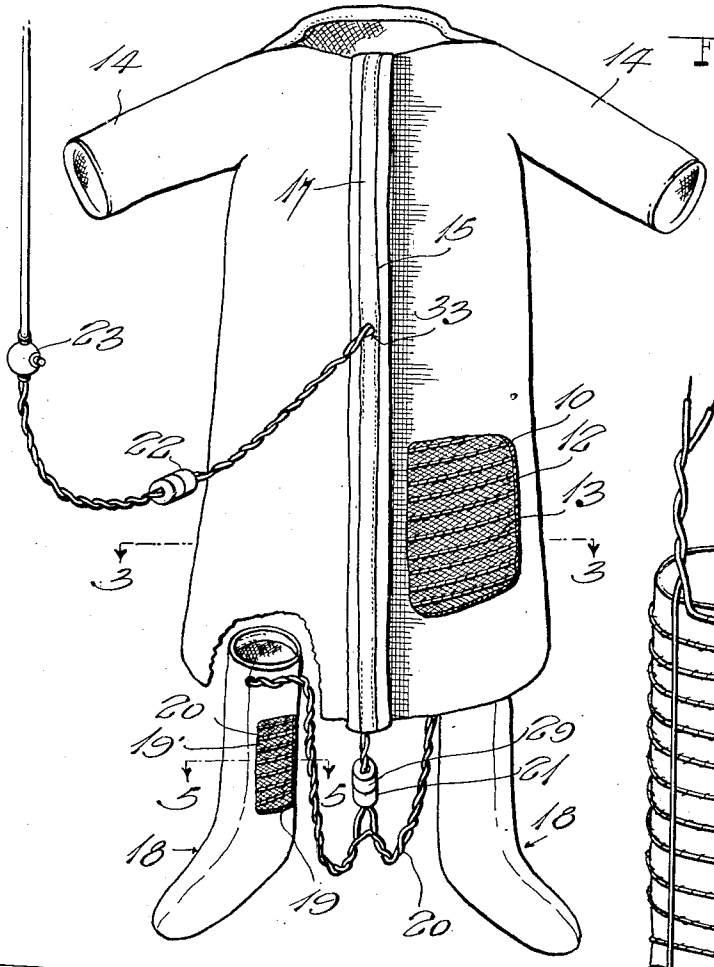


FIG. 1.

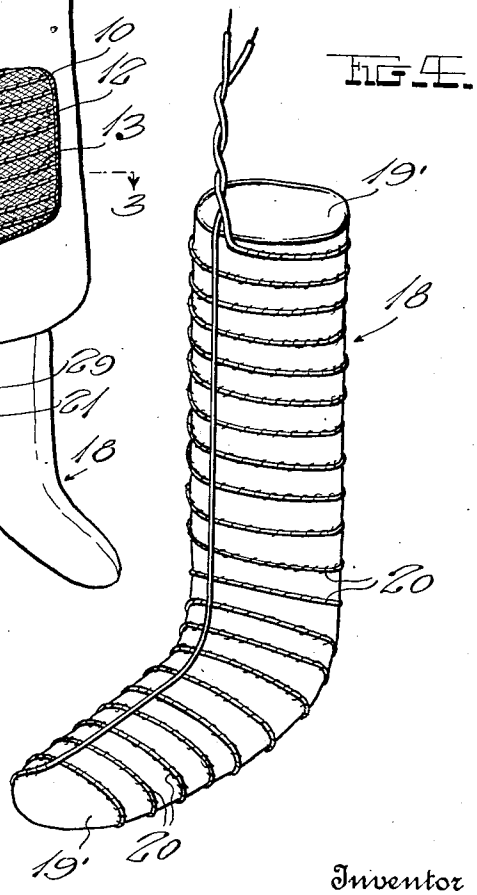


FIG. 4.

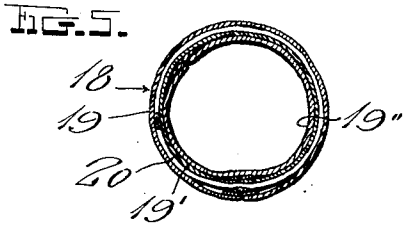


FIG. 5.

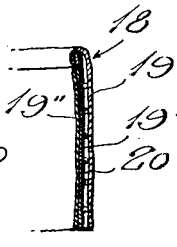


FIG. 6.

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3 SHEETS—SHEET 2.

FIG. 2.

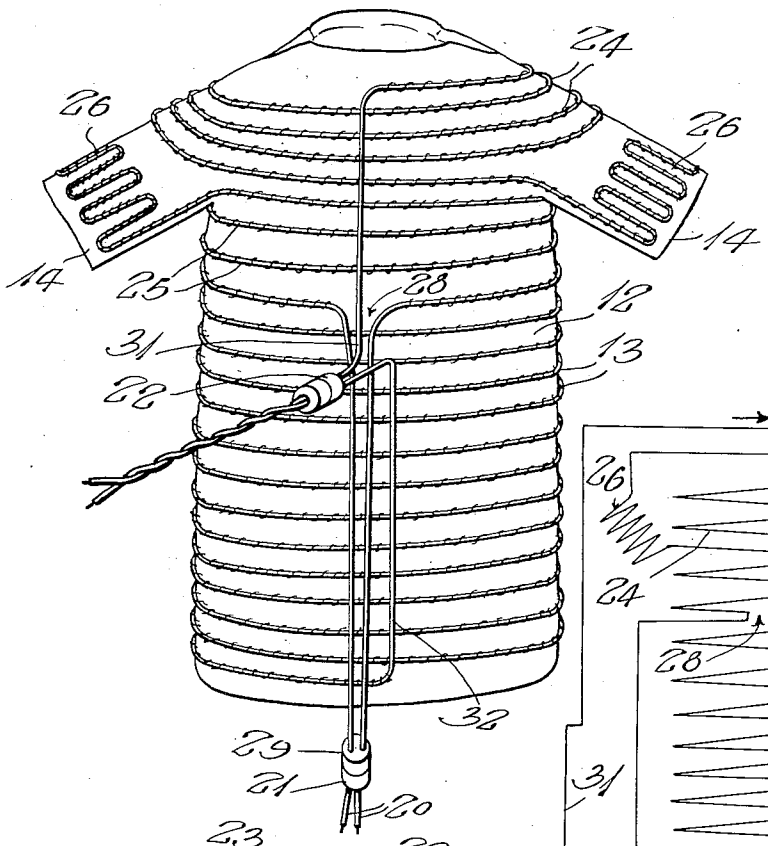
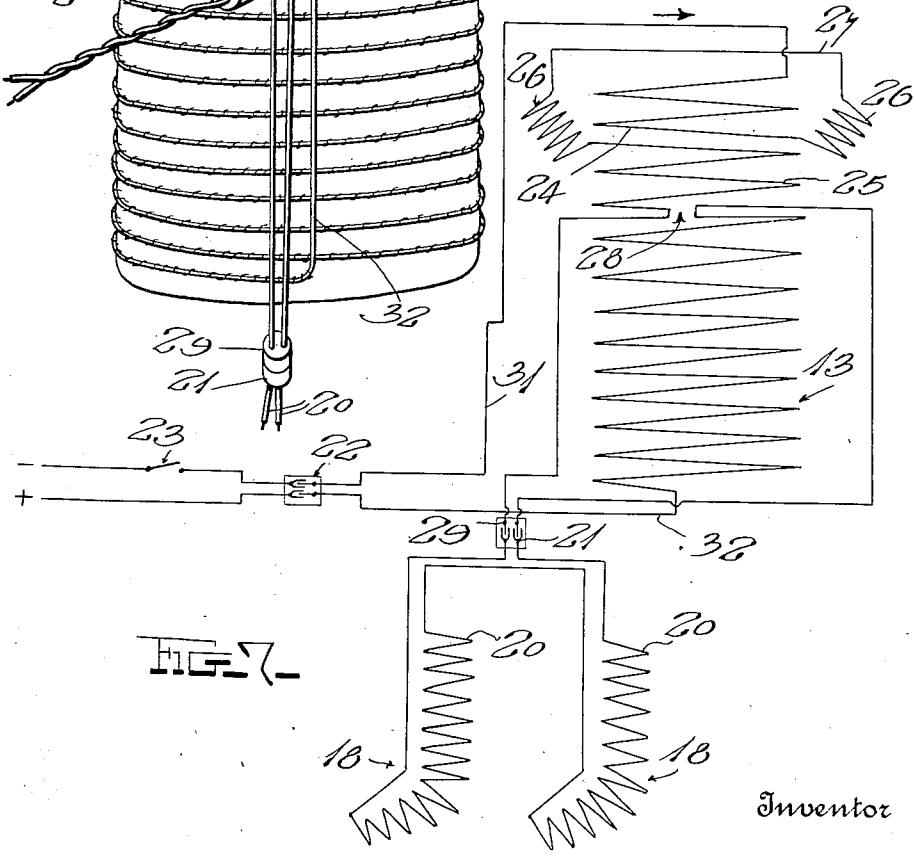


FIG. 7.



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3 SHEETS—SHEET 3.

FIG. 8.

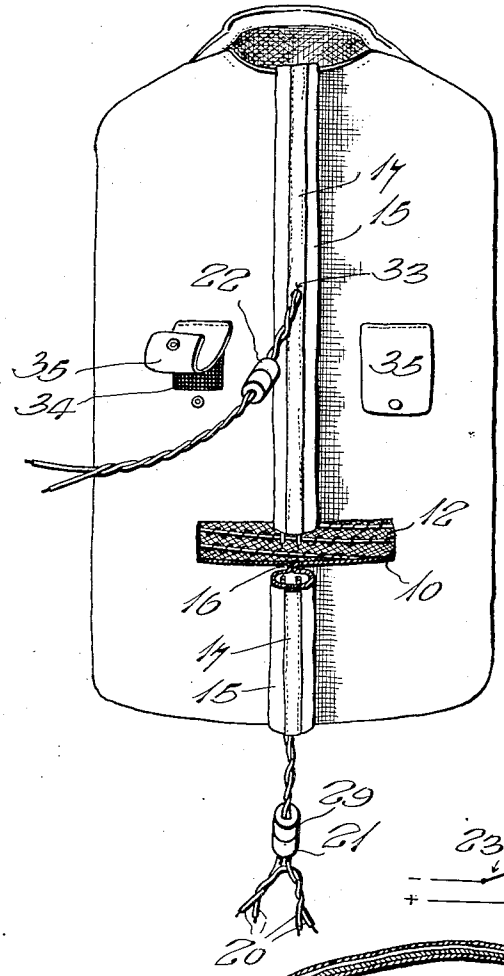


FIG. 9.

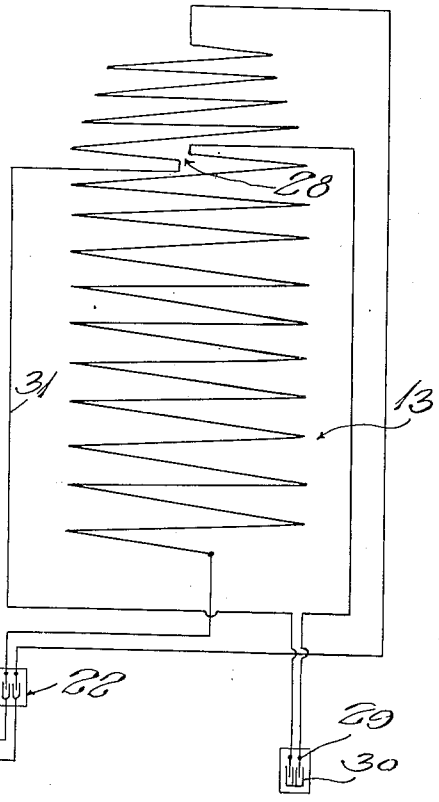
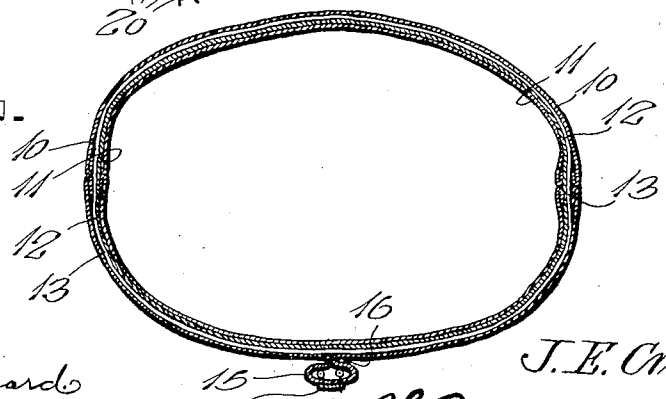


FIG. 3.



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UNITED STATES PATENT OFFICE.

JOEL E. CRADDICK, OF DENVER, COLORADO.

ELECTROTHERMAL GARMENT.

1,394,810. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed April 3, 1919. Serial No. 287,184.

To all whom it may concern:

Be it known that I, JOEL E. CRADDICK, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Electrothermal Garments; and I do declare the following to be full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electro-thermal garments and it relates more specifically to an improved thermo-magnetic health garment.

One object of this invention is to generally improve upon devices of this character by applying my improved wiring system to my improved form of tubular body garment in a manner to obtain the most beneficial results.

Other objects and advantages may become apparent to persons who read the following details of description in connection with the accompanying drawings in which:

Figure 1 is a front elevation of my improved health garment, a portion being broken away to more clearly show the electric connection of the garment with a thermo-magnetic boot which may be connected with the garment.

Fig. 2 is a front elevation of the inner fabric of the garment and the electric conductor secured thereon.

Fig. 3 is a horizontal sectional view, the section being taken along the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the inner fabric of one of my thermo-magnetic boots having an electric conductor wound around the same.

Fig. 5 is a horizontal section along the line 5—5 of Fig. 1.

Fig. 6 is a detail view illustrating a vertical section through a portion of one of the boots shown in Figs. 1 and 4.

Fig. 7 is a diagrammatic view illustrating the electric system or circuit employed in connection with the garment and boots disclosed in Figs. 1 to 6 inclusive.

Fig. 8 is a view somewhat similar to Fig. 1, of a modified form of the garment.

Fig. 9 is a diagrammatic view illustrating the electric system or circuit employed in connection with the garment and boots disclosed in Figs. 1 to 6 inclusive.

Referring to these drawings in detail, in which similar reference characters correspond with similar parts throughout the several views, the tubular body garment comprises an outer fabric 10, an inner fabric 11 and an intermediate fabric 12, the latter having a conducting wire 13 extending spirally therearound and secured thereto by stitching or other appropriate means. The outer fabric may be of flannel or other soft and heat retaining material and it may be of the construction shown in Fig. 1, having sleeves 14, or it may be sleeveless as shown in Fig. 8. In each instance, however, the garment is tubular or continuous in the horizontal direction, that is, it is not designed to open either at the front or rear or at either side, but is open only at its top and bottom. As shown in both Figs. 1 and 8, and also in Fig. 3, the outer fabric is formed with a conduit 15, this conduit being formed of the meeting front edge portions of the fabric which forms the portion which surrounds the body. In forming this conduit, a row of stitching 16 extends from the bottom to the top of the garment, and a row of stitching 17 also extends from the bottom to the top and is substantially parallel with the stitching 16 and spaced therefrom a sufficient distance to permit the substantially cylindrical conduit to be formed as more nearly disclosed in Figs. 3 and 8.

Referring again to Fig. 3, in which the inner and outer fabrics or linings are more clearly shown, the intermediate fabric may also be considered as an inner fabric, with reference to the outer fabric which incloses it. This inner or intermediate fabric 12 is preferably buckram or other relatively stiff material, so that the conducting wires which are attached thereto are held in the desired spaced relation to one another, and the wires are more easily stitched to this material than to a material which has a less degree of stiffness.

The inner fabric 11 may be of any appropriate soft and yieldable material, and in the following description and claims, the inner fabric 11 may be included or considered as a part of the intermediate or inner fabric 12.

The boots 18 illustrated in Figs. 1, 4, 5 and 6 may also be formed of outer, inner and intermediate fabrics 19, 19′ and 19″ respectively, (see Figs. 5 and 6), and a plurality of helical turns 20 of wire may be ap-

plied on the fabric 19' as illustrated in Fig. 4. The terminals of the wires 20 connect with an attaching plug 21 as shown in Figs. 1 and 8, for a purpose to be hereinafter disclosed.

Referring now to Figs. 2 and 7, it will be seen that the conducting wire 13 forms a part of an electric circuit which may be connected by means of a plug-socket-connection 22 to an external source of electric current. This source may consist of any generator of sufficiently high potential to furnish a sufficiently strong current for the purpose of heating the conducting wires 13 and 20 to the desired temperature, but preferably, an alternating current of high frequency is employed. A switch 23 may be conveniently located in the external source of current, so that the user of the current can turn the current on and off at will.

Still considering Figs. 2 and 7, it will be seen that the circuit 13 comprises a plurality of helical coils or turns 24 above the shoulder portions of the garment, a plurality of turns or coils 25 below the shoulders, and two series of turns 26, one series on each arm of the garment. In order to more clearly describe the circuit, the inner fabric may be considered as comprising a super-shoulder portion around which the turns 24 extend, a sub-shoulder portion around which the turns 25 extend, and two arm portions on which the turns 26 are secured. However, the turns 26 do not surrounud the arm portions, but this portion of the conductor extends back and forth along the arm portion as illustrated in Fig. 2. Therefore, the coils or turns 24 and 25 which surround the body serve as induction coils, the body of the person serving somewhat as a core in an ordinary induction coil, and therefore, the conductor 13, being of high resistance, not only transmit their heat to the wearer's body, but the magnetic action of these wires beneficially affects the person's body in ways that will readily be understood by physicians and others who are familiar with electric treatments of human bodies. However, the series of turns 26 on the arm portions, which do not surround the arm portions, merely transmit their heat to the arm portions.

From the foregoing description, it will be seen that the series of turns 24, the series of turns 26 and the series of turns 25 are connected in electrical series, and it will now be pointed out that the two series 26 are directly connected to one another. This feature is clearly illustrated in the diagrammatic view, Fig. 7, in which the horizontal section 27 is the direct means of connecting the two arm series 26. Therefore, considering that the current is flowing in the direction of the arrow in Fig. 7, it first passes through the super-shoulder series 24, then through the two arm series 26, and then through the sub-shoulder series 25. The sub-shoulder series of coils or turns 25 is tapped at 28, and the leads from the tapped portions 28 extend from the inner fabric 11 into the conduit 15 and thence down through the conduit and terminate in an attaching-plug-socket 29 to which the attaching plug 21 may be attached. However, when it is not desired to attach the plug 21, a circuit-closing plug 30 may be employed as illustrated in Fig. 9. Therefore, it will be seen that my improved body garment may be used either in connection with the boots 18 or without them. Obviously, the boots can also be used separate from the body-garment, by attaching the plug 21 to a socket like the one designated 29, but connected to a conductor other than that of the body-garment. It will be seen that the boots can be used to magnetically treat the patient's arms as well as the legs, and are also useful to apply heat to parts of the trunk and neck of the person.

The upper turn of the super-shoulder section extends down through the conduit 15 to the middle front part of the garment, (that is, of the sub-shoulder section), and the lower turn of the sub-shoulder series extends upward through the conduit 15 (as illustrated in Fig. 2,) and these leads terminate in the socket of the plug-and-socket-connection 22, it being understood that these leads 31 and 32 extend through an opening 33 in the intermediate portion of the conduit 15.

Referring now to the diagrammatic view illustrated in Fig. 9, it will be seen that it discloses substantially the same wiring system as that disclosed in Fig. 7 except that the arm series of turns may be eliminated.

When the modified form shown in Fig. 8 is employed, hand holes 34 may be provided, so that the pulse of the patient may be examined through these hand holes, and flaps 35 may be provided with snap fasteners or other securing means whereby the flaps may be secured in closed position.

Although I have described this embodiment of my invention very specifically, it is not intended to limit this invention to these exact details of construction and arrangement of parts, but I am entitled to make appropriate changes within the scope of the inventive idea disclosed in the foregoing description and following claims.

What I claim as my invention is:

1. In a device of the character described, a body garment having inner and outer fabrics, said outer fabric having edge portions that are secured along two lines up and down the front part of the garment to form a conduit, and an electric circuit comprising a series of turns of conducting wire secured between said inner and outer fabrics, said series extending from the upper part of the garment to the lower part thereof and hav-

ing upper and lower terminals meeting within said conduit and extending outward laterally of the conduit and terminating in an attaching plug.

2. In a device for electrically treating a person, a body garment having sleeves and being open at top and bottom but having all its upright sides closed, said garment including a tubular flexible inner lining, a series of helical turns of conducting wire secured on and extending spirally around the part of the lining above said sleeves, a series of helical turns of conducting wire secured on and extending spirally around the portion of the lining below said sleeves, and a series of non-helical turns of conducting wire secured on each of said sleeves, the turns of conducting wire above and below and on said sleeves being electrically connected in series.

3. In a garment for electrically treating persons, a body garment open at both ends and closed at front and back, said body garment including a tubular flexible inner lining, a series of helical turns of conducting wire secured on and extending spirally around said tubular inner lining in such relation that they combine to form a solenoid for inducing magnetism in the bodies of persons who wear the garment, a tubular member to receive a limb of a person being treated, a series of helical coils forming a solenoid around this limb-receiving member, means to detachably connect the solenoid of the body garment in series with that of said limb-receiving member, and means to close the circuit of the first said solenoid when the limb-receiving member is detached, for the purpose specified.

In testimony whereof I have hereunto set my hand.

JOEL E. CRADDICK.