

[54] **ELECTRICALLY HEATED ARM OR LEG SLEEVE**
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[22] Filed: **Sept. 24, 1971**
[21] Appl. No.: **183,445**
[52] U.S. Cl. **219/211, 128/402, 219/527**
[51] Int. Cl. **H05b 1/00**
[58] Field of Search **219/211, 527-529; 128/379, 402; 2/2.1 R**

[56] **References Cited**

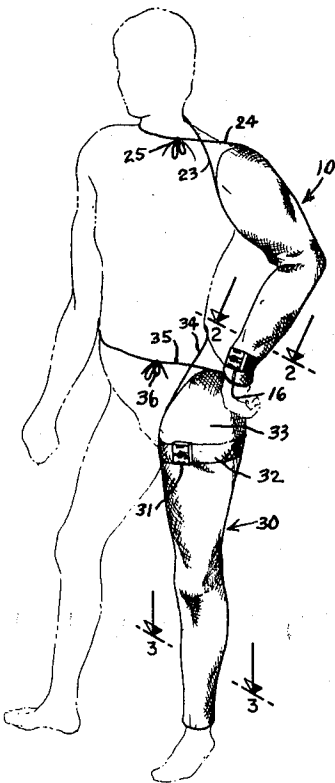
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[57] **ABSTRACT**
There is shown by this disclosure an arm or leg sleeve that is electrically heated and which has an insulated external layer means and an internal non-insulated

layer means for absorbing the heat and directing it to the surface of the arm or leg. The inner layer includes electric wiring arranged in sections with an upper section above the elbow or knee of the wearer and a lower section lying therebelow so that in working of the arm or leg, it will not be hindered by the wires and the wires will not be worked loose by the continuing flexing of the arm or leg when the sleeve is fixed thereover. A control box is provided on the sleeve which can govern the heat to either the upper or lower portions of the sleeve or can combine the upper and lower sections into the same circuit for joint heat or full heat along the full length of the limb. The sleeves are formed of layers including an insulated outer layer means and a heat conducting non-insulated inner layer means. The electric wires are embedded in the insulating material and a wool-like layer is provided for heat conducting engagement to the surface of the limb. In order that the sleeve can be used with a wet surface or over a wet cloth upon the skin surface a removable protective plastic cover of tubular shape corresponding to the shape of the sleeve can be provided within the same to cover up the wool-like heat conducting material and to keep the same from becoming wet. Waterproof plastic cover is attached to the upper edge of the sleeve and retained thereby against inward displacement as the sleeve is pulled over the limb with the protective cover.

3 Claims, 7 Drawing Figures



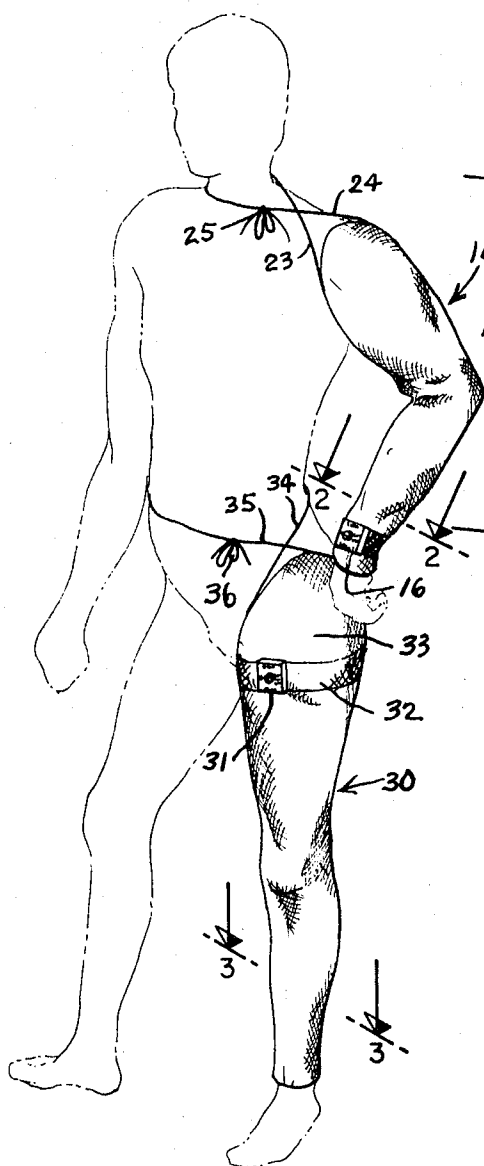


Fig. 1.

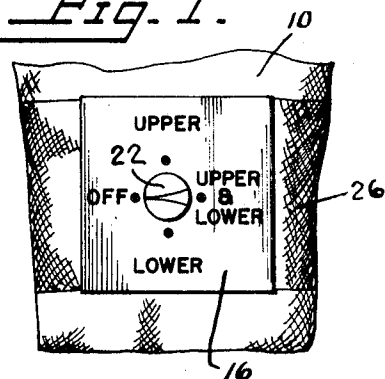


Fig. 4.

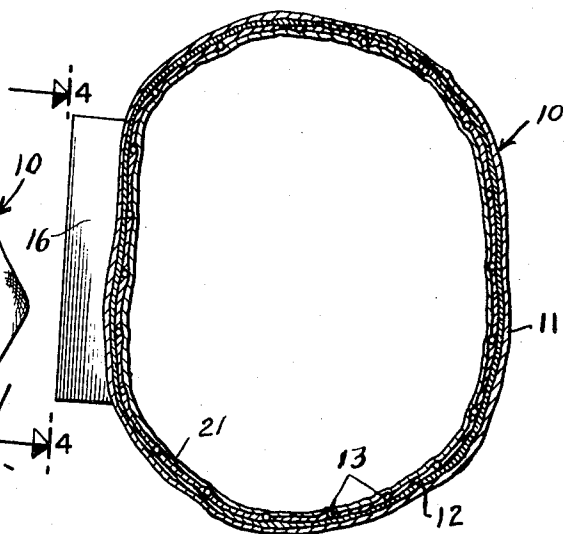


Fig. 2.

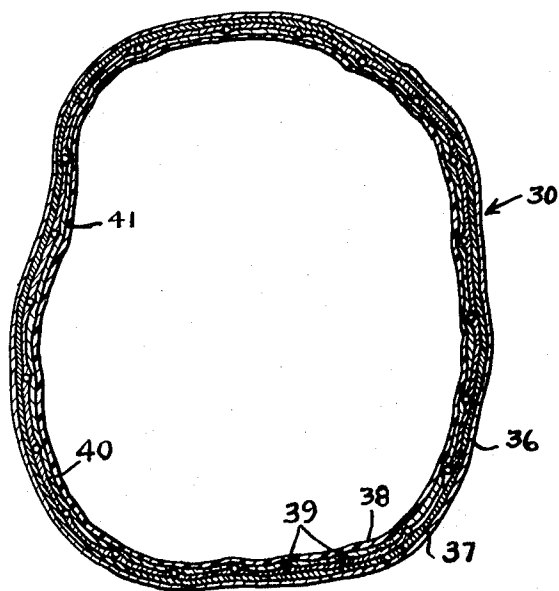


Fig. 3.

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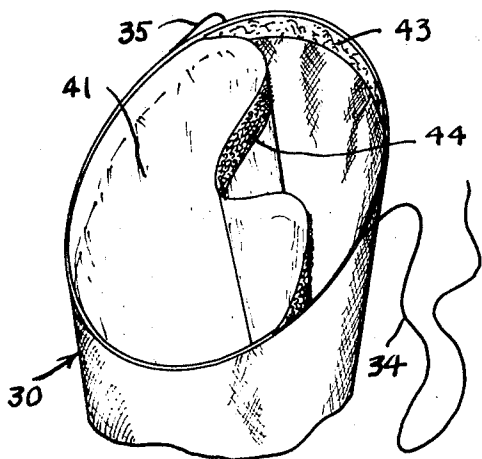


Fig. 5.

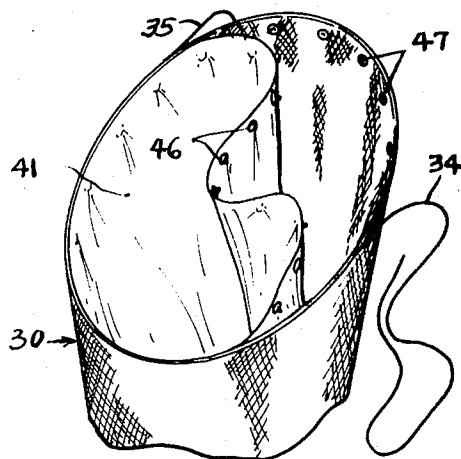


Fig. 6.

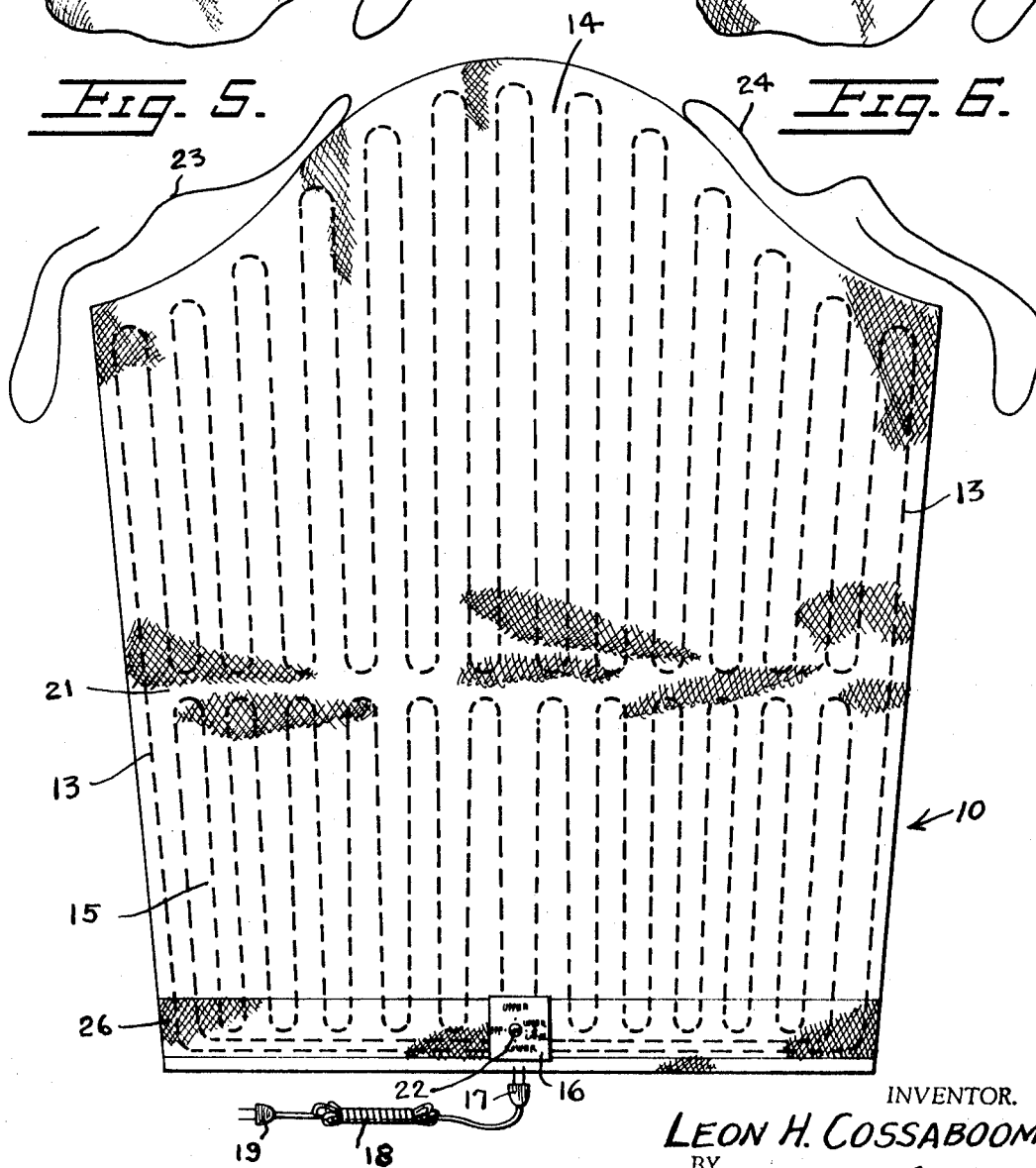


Fig. 7.

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ELECTRICALLY HEATED ARM OR LEG SLEEVE

This invention relates to an electrically heated arm sleeve for therapeutically treating by means of heat and at the same time the complete area of the arm or leg to which the sleeve is attached.

It is an object of the present invention to provide an electric heating device which can cover the complete area of an arm or leg so as to wholly heat the surface thereof throughout its entire length and in an even manner for the purpose of minimizing pain from bursitis, arthritis and muscular ailments.

It is another object of this invention to provide a tightly fitting electrically heated sleeve wherein the wires will be retained in the sleeve in such a manner as to provide heat to either upper or lower sections and spaced from one another so as to not interfere with the bending of the elbow or knee and thus keep the sleeve from being worn and the heat wires being loosened over the elbow and knee areas of the sleeve.

It is still another object of the invention to provide an electrically heated arm or leg sleeve in which the outer layer means is insulated and kept cool while the inner layer absorbs the heat from the electric wires and imparts the heat directly in flush contact with the skin to the ailing areas of the arm or leg.

It is a further object of the invention to provide an electric heated arm sleeve which can be adapted for applying either dry heat or wet heat by the provision of a plastic or waterproof protective cover corresponding in shape to the sleeve and retained to the upper edge of the sleeve and extended downwardly thereinto so that when the sleeve is pulled over the limb the protective cover will follow leaving the wool-like material used for the provision of dry heat protected by the waterproof cover whereby the same sleeve can be readily adapted for supplying wet heat to the limb.

Other objects of the invention are to provide an electrically heated arm or leg sleeve, having the above objects in mind, which is of simple construction, easy to apply to the limb, has a minimum number of parts, adapted to be worn under a garment, flexible, easy to supply with electric current, of pleasing appearance, light in weight, efficient and effective in use.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of two of the electric heated sleeves of the present invention respectively fitted over an arm and a leg of a person.

FIG. 2 is an enlarged transverse sectional view of the arm sleeve taken on line 2—2 of FIG. 1.

FIG. 3 is an enlarged cross sectional view of the leg sleeve as viewed on line 3—3 of FIG. 1.

FIG. 4 is a front elevational view of the lower end of the arm sleeve and looking upon the control button unit.

FIG. 5 is a fragmentary top perspective view of one of the sleeves showing a removable inner member therein by which the inner part is assembled upon the interior of the outer part by threaded hook and felt projections on the respective parts.

FIG. 6 is a perspective view similar to FIG. 5 in which snap fasteners are used for the securing of the inner part to the outer part.

FIG. 7 is a plan view of the arm sleeve opened up and disengaged from the arm and of the electric cord that is attached to the switch button control box, the wires being disconnected from one another within the heater to permit bending at the elbow, and with the tie cords at the upper end for holding the arm sleeve against downward displacement from the shoulder.

Referring now particularly to FIGS. 1, 2, 4 and 7, 10 represents generally an electrically heated arm sleeve shaped and contoured to fit tightly the arm of a person. This sleeve is made up of a heat insulating foil outside layer 11 against which and on the inner wall thereof is an intermediate layer 12 of electrically non-conductive material to which electric heating wires 13 are adhered according to a pattern shown in FIG. 7. The wires are distributed in continuous fashion along an upper layer serving to heat the upper arm and a bottom area 15 serving to heat the forearm when the sleeve is applied to the arm as shown in FIG. 1. The heating wire systems of the upper and lower portions 14 and 15 are wired into a terminal control box 16 in such a manner that either the upper area or the lower area can be turned on separately or both areas can be arranged in series so that the full arm sleeve will be heated. The control box has a receptacle at its lower edge serving to receive a cable wire plug of a cable 18 that has a plug 19 at its opposite end for engagement with any wall receptacle of a household. It will be seen in FIG. 7 that the upper area 14 and the lower area 15 are separated from one another as indicated at 21 so as not to interfere with the bending of the arm at the elbow that might eventually disengage the wires from the inner layer material 12 but more important is to allow freedom for the use of the arm when this sleeve is attached to the same as shown in FIG. 1. The sleeve while being shown in plan layout in FIG. 7 is closed upon itself with its side edges stitched together or even retained to one another by releasable fasteners but preferably closed upon itself in a firm manner so that the arm has to be extended downwardly into the sleeve to insure tight fitting of the sleeve about the arm. The sleeve may preferably be undersize for the particular arm so that an expansion or tight grip is made of the sleeve with the surface of the arm. An inner layer of heat conducting material and as indicated at 22 is provided over the wires 13 and may be adhered thereto. This inner layer can be made of felt or even soft plastic but such that the heat generated from the wires 13 will be easily dispersed to the arm surface to gain the heating effect that is desired to overcome the stiffness of the limb.

The control box terminal 16 as best seen in FIG. 4 has a turn button that can be turned to any one of four locations as indicated by the dots spaced 90 degrees apart from one another and according to the heating that is desired as given by the legends on the face of the control box. It will be noted that either the upper or lower areas 14 or 15 can be delivered heat when the control button 22 is turned to either one of the upper or lower positions and if desired both heating of the upper and lower portions can be effected when the turn button 22 is turned to a position 180 degrees from an "off" position.

The arm sleeve 10 is of larger diameter to accommodate the shoulder of the wearer and in order to keep this larger diameter and the upper end of the arm sleeve held over the shoulder, tie cords 23 and 24 are provided which after being turned about the neck of

the wearer as best seen in FIG. 1, can be tied at 25 in a bow knot. At the lower end of the arm sleeve and across the closed ends of the wires of the area 15 is a reinforcing cuff band 26 formed by the adherence of the strip of material thereover and lying under the control box 16. This band 26 will tend to provide a more stiffened material so that the arm sleeve is not worked at the wrist of the wearer in such a manner as to break away the wires from the layers of material within the arm sleeve to which the wires are adhered. In this way short-circuiting of the wire areas will be prevented.

The outer layer 11 may also be formed of synthetic material such as "nylon" and similar to a man's shirt, and the intermediate layer 12 would be formed of light foil for deflection of the heat toward the arm or leg surface. The wire layer 13 can be of synthetic material of light weight such as "orlon." The fourth layer 22 that is next to the skin may be of "felt," soft wool or cham-
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mois cloth that will contain and hold heat and will have a good feeling against the skin. The outer layer 11 with the heat reflecting foil 12 will remain cool while the heat generated by the electric wires is directed inwardly the inner layer 21 retains the heat and provides a good feeling upon the skin. The outer layers will thus remain quite cool.

Referring now particularly to FIGS. 1, 3, 5 and 6, there is shown a leg sleeve 30 constructed somewhat like the arm sleeve except that the control of the heat is provided at the upper or large end of the sleeve as indicated at 31. The wires in the leg sleeve are arranged similar to the arrangement of the wires shown in FIG. 7 for the arm sleeve so that they are separated from one another at the knee so that bending of the knee is made possible without the wires being continually bent when the sleeve is upon the leg and the leg is used in walking or in any movement requiring the bending of the knee. The upper end of the sleeve 31 is reinforced by a band 32 overlying the materials, either in the form of an adhesive or an additional piece of strap material. The leg sleeve extends upwardly beyond the band 32 to provide a full covering for the upper leg and hip as indicated at 33. Tie strings 34 and 35 are connected to the upper end of the top portion 33 of the sleeve and are drawn around the body of the wearer at his waist and tied at 35' to maintain the sleeve in tight engagement with the hip and upwardly upon the leg of the wearer. An electric cable plug such as shown in FIG. 7 at 17 can be fitted into the control box 31. This control box can supply heat to either upper or lower heating areas or to both at the same time depending upon the turning of the knob in the manner as described in connection with the description of the control box 16 shown in FIG. 4 and used on the arm sleeve 10.

This leg sleeve is made up of similar layers of material including an outer layer 36 of synthetic pliable cloth material similar to that of an ordinary man's shirt, a layer 37 of metal foil, a layer 38 containing heating wires 39 and of light synthetic material in which the wires are embedded, a layer 40 of soft heat retaining material. With such an arrangement of layers substantially a complete capacity of the heating units is directed toward the arm or the leg surface with the outside layers remaining quite cool.

The leg sleeve 30 will be pulled upwardly over the leg and against the skin in the same manner that the arm sleeve 10 is pulled upwardly and with the tie cords 34 and 35 tied at 35', the leg sleeve should remain in place

over the leg and provide warmth and heat to the full area of the leg both below and above the knee and over the hip to give a good feeling to the skin and to rid the leg of muscular pain. In the case of bursitis, neuritis, arthritis a damp heat is desired and in order to keep the inner layer 40 from becoming wet from the placing of a salve or water heat upon the surface of the leg, this leg sleeve and similarly the arm sleeve 10 can be altered for this purpose. The inner layer 40 can be lined with a snap-on layer of polyethylene which is waterproof and which can extend over the wetted leg surface or over a damp cloth fitted about the leg or arm surface and over which the arm or leg sleeve is pulled. In this way a damp heat is provided to the arm or leg surface. Such a plastic layer is indicated at 41 in FIG. 3. This layer 41 as best seen in FIGS. 5 and 6 can be removable to expose the inner felt or wool layer 40 when only a dry heat is desired. It should be seen that the inner layer 40 where the leg or arm sleeve is to be used wholly with damp cloth can be replaced by the plastic liner 41, but preferably it is desirable to have the arm or leg sleeve adapted for both dry and wet heat and thus the plastic layer 41 can be detachably supplied to the interior of the sleeve as best shown in FIGS. 5 and 6.

In FIG. 5 the upper edge of the sleeve 30 is provided at its upper edge with a band of connecting material as indicated at 43 lying at the upper edge and surrounding the full area thereof. The plastic liner 41 is adapted to extend substantially the full length of the sleeve and has a cooperating pronged hair projections 44 adapted to releasably unite with the connecting band 43 on the sleeve 30. Since the connection is made at the upper edge of the sleeve there is little need for corresponding connections at a lower elevation on the sleeve since the liner merely needs to be retained while the sleeve is being pulled on over the arm or the leg. It is understood that the plastic layer 41 renders the sleeve waterproof so that the dry wool layer 40 will not be seriously affected by the wetness of the wet cloth or wet material on the leg. The plastic protecting cover or layer 41 upon being removed from the sleeve can be readily cleaned or washed and then replaced into the sleeve.

In FIG. 6, corresponding male and female snap fasteners 46 and 47 are used for the securing of the inner plastic liner 41 to the upper edge of leg sleeve 30. These fasteners are arranged in series about the top edges of the sleeve and the plastic protective cover or liner 41.

While these heated sleeves are powered by household current it should be understood that they may also be powered by battery but battery power is somewhat cumbersome since the batteries would have to be carried by the person. Nevertheless this may be arranged by adapting the heating wires for battery power.

It should be apparent that there has now been provided a very practical means for applying heat to the full arm area above and below the elbow and even over the shoulder and that a similar means has been provided for providing a full area of heat above and below the knee upwardly from the ankle and over the hip area. It can be seen that these sleeves can be attached directly to the arm and leg over the skin and that clothing can be readily adjusted and worn thereover. An electric receptacle is easily accessible in the household or in the office and can be easily and readily attached to the control boxes of the sleeves. Upon making the feeding adjustment the heat can be supplied to the upper and

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lower oart of the limb or to both parts of the limb simultaneously.

It should be apparent that a full wired sleeve unit has been provided with an outer covering being that of a heat insulator and an inner lining or layers of a non-insulator causing the full amount of heat to be completely encased about the limb and such that it will fully penetrate the surface thereof.

This seeeve will give relief to people having bursitis, muscular pain, arthritis and other similar ailments. These units are merely slipped on over the arm or leg as one would pass the arm or leg into a garment. Both the sleeves and the liners are of tapered tubular configurations and are substantially the same size.

While various changes may be made in the detailed construction it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. An electrically heated form-shaped tight fitting arm or leg sleeve, said sleeve being adapted to substantially the full length of the arm or leg and including respectively the shoulder or the hip of the wearer, said sleeve comprising heat insulated outer layer of flexible outer shirt-like material internally lined with heat reflecting flexible metal foil, and electrically heated intermediate layer having heating wires embedded therein and insulated from one another, and an inner felt-like heat dispersing layer adapted to have full flush engagement with the total skin area of the arm or leg to impart dry heat thereto all of the layers being joined one over the other and together and the sleeve tapering from its

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upper end of larger diameter to its lower end of small diameter and conforming in full tight fitting engagement with the arm or leg, the electric wiring of the intermediate heating layer being arranged in two sections, one section extending upwardly from an elbow or knee joint to the shoulder or hip end of the sleeve and downwardly from the elbow or knee joint to the wrist or ankle, and a reinforcing stiffening strip band secured about the sleeve adjacent one end thereof and serving to hold the wires more rigid in that area thereof, an electric switch control means fixed to the reinforcing strip band and connected to the wire sections above and below the joint areas and having plug receptacle means for receiving a supply of electric current, and tie cords connected to the upper end of the sleeves and adapted to be tied about the neck or waist to hold sleeves at their upper ends in flush tight engagement with shoulder or hip area.

2. An electrically heated arm or leg sleeve as defined in claim 1 and said control means including adjustment for the distribution of current to at least one of the wired sections for heating purposes.

3. An electrically heated arm or leg sleeve as defined in claim 1 and a waterproof protective liner covering for use within the sleeve when a wet application is made over the skin of the limb and said covering of said sleeve having cooperating releasable fastening means for the securement of the covering to the upper end of the sleeve and said covering being of tapering formation conforming to the interior of the sleeve and extending substantially to the full length of the sleeve.

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