

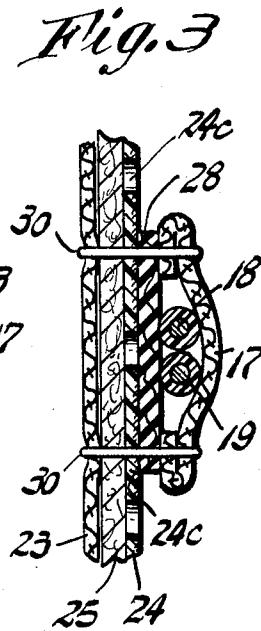
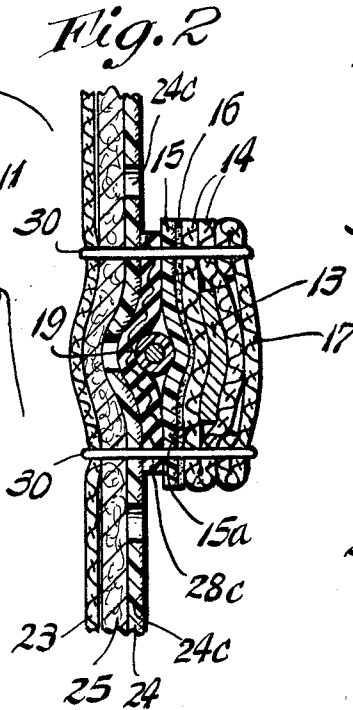
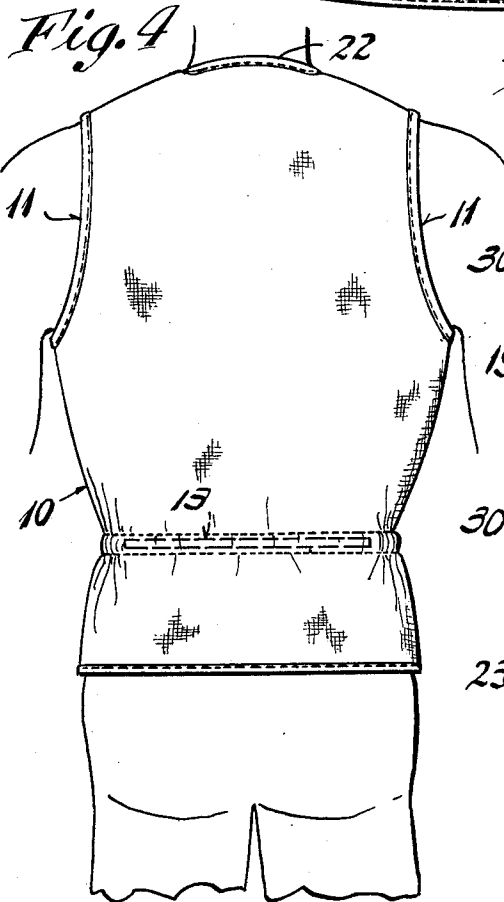
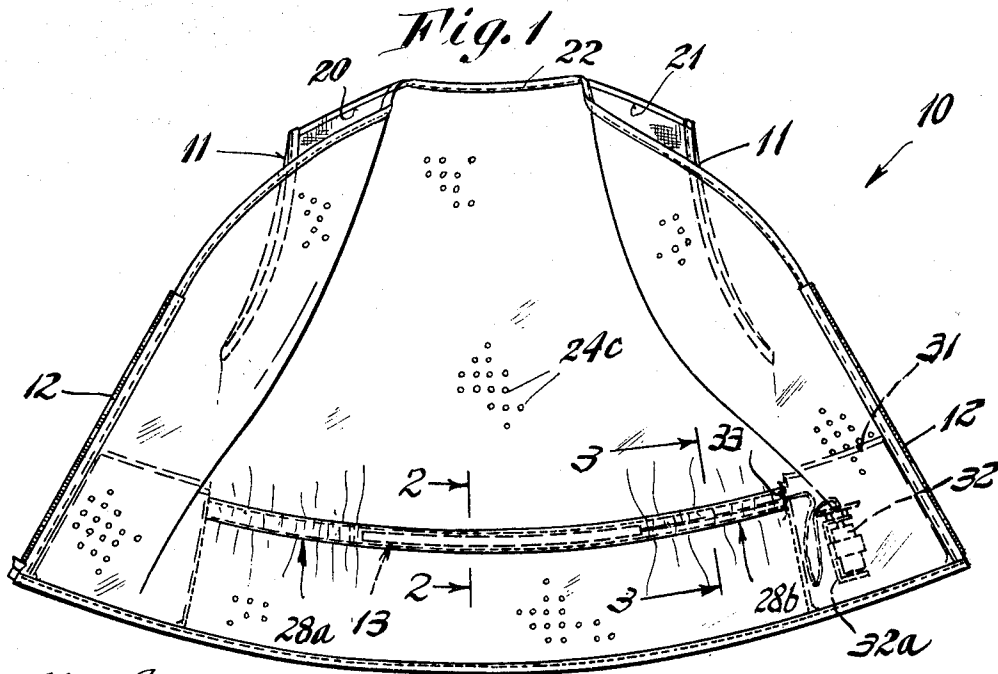
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3,501,616

ELECTRICALLY HEATED BODY GARMENT

Filed March 6, 1968



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**ELECTRICALLY HEATED BODY GARMENT**

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4 Claims

**ABSTRACT OF THE DISCLOSURE**

A garment for covering the upper torso of a wearer and having an electrical heat generating resistance strip positioned only at the small of the wearer's back with the heating element being resiliently urged into contact with said wearer's back and in which the garment is formed of three layers, an outer woven shell, a lining of reflective plastic film and an inner lining of batting disposed therebetween.

While it has heretofore been proposed to have garments that in addition to insulating against the loss of body heat also have electrical heaters for adding heat to the garment, such garments have not been found to be completely satisfactory. Such heretofore garments have had a heated portion which extended over a substantial area of the body and to be effective, they accordingly required a relatively large electrical energy source which limited their usefulness by restricting the movement of the wearer. They are generally unsuited for use with a portable power supply, such as flashlight cells, in view of relative inefficiency in providing the maximum utilization of the generated heat to the user. Moreover, said garments have usually been formed of nonstretchable material so that they are spaced from the body and in effect are baglike, whereby the entire garment is loose on the wearer and the heating element merely heats the interior of the garment.

It is accordingly an object of the present invention to provide an electrically heated garment which while effectively heating the upper part of a wearer may utilize a small portable power source or batteries.

Another object of the present invention is to provide a garment for the upper torso of a wearer which has a heating element which concentrates the heat solely at a sensitive portion of the torso to thereby provide the maximum effect of the heat to the user.

A further object of the present invention is to provide an electrically heated garment which is formed of essentially nonstretchable insulating material to be relatively loose fitting but yet in which the heating element is urged into contact with the wearer even with the remainder of the garment being somewhat loose on the wearer.

Still another object of the present invention is to provide a garment that is relatively economical to manufacture but which has substantial body heating insulating ability.

In carrying out the present invention, the embodiment specifically disclosed herein consists of a vest which has a portion that extends transversely of the small of the wearer's back. Though, for the purposes of the present invention, it is immaterial if the garment has sleeves or is sleeveless, it does have a back that covers the wearer's back and is normally loose with respect thereto. Specifically, the back has a portion that extends transversely across the small of the wearer's back. At this portion there is secured a strip of electric resistance wire which converts electric power to the strip into heat along the surfaces of the strip. The strip is elongate to extend across the small of the wearer's back and supplies heat

solely to this area which I have found to be an area that is extremely sensuous to heat.

As the heat is localized in this area and not spread out, the maximum physiological effect from the quantity of energy supplied by the power source is achieved. Thus, the garment of the present invention is capable of being heated just by flashlight batteries which may be carried in a pocket formed in the vest.

The garment is formed to have extremely high insulating ability and consists of essentially an outer shell of woven synthetic fiber, as for example, nylon taffeta, gabardine, and a lining of perforated, thin, impervious plastic film such as "Mylar." The lining has a reflective inner surface for reflecting the body heat facing the wearer. Positioned between the shell and plastic film is a layer of batting, such as polyester fiber, that is made somewhat stiff by the use of a plastic bonding agent. As the plastic film is not stretchable, and the batting somewhat stiff, they tend to render the garment relatively loose fitting and in accordance with the present invention, that portion of the garment carrying the electric heating element is resiliently urged against the wearer's back by the use of resilient means positioned in this area. More particularly, elastic strips are positioned to transversely compress this portion containing the heating element against the wearer, so that heat will be transferred directly to the wearer.

Other features and advantages will hereinafter appear.

In the drawing:

FIGURE 1 is a view of the electrically heated garment, specifically a vest, of the present invention.

FIG. 2 is an enlarged view taken on the line 2-2 of FIG. 1.

FIG. 3 is an enlarged view similar to FIG. 2 and taken on the line 3-3 of FIG. 1.

FIG. 4 is a sketch of the relative positioning of the heater on a user.

Referring to the drawing, the garment of the present invention is generally indicated by the reference numeral 10. It is specifically disclosed as a sleeveless vest having arm holes 11 together with a closure means, such as a zipper 12, formed on adjacent front edge portions with the zipper adapted to be positioned at the front of the wearer. The portion of the garment which is adapted to be located at the small of the wearer's back has an electric heating strip generally indicated by the reference numeral 13 secured thereat.

Referring to FIG. 2, the heating element consists of a length of relatively wide to thick, somewhat flexible, electrical resistance metal covered by a folded over sheet of pervious fabric material 14 having thermoplastic adhesive so as to bond the heating element therebetween to be secured thereto. A thin strip of plastic film such as "Mylar" 15 having a reflective surface 15a is adhesively secured as by adhesive 16 to one side of the sheet 14. The other side of the sheet 14 is overlaid by a piece of cotton bias tape 17 having inturned edges. The resistance strip 13 has two insulated conducting wires 18 and 19 connected to each of its ends and the wire 19 is positioned just under the bias tape 17 in FIG. 2. For a fuller description of the heating element and its associated parts, reference is made to my copending application Ser. No. 597,634, filed Nov. 29, 1966.

The garment 10 has the arm holes 11 formed by a pair of seams 20 and 21 extending from the arm holes 11 to the upper edge 22 or neck encircling portion. The garment is composed of three layers of material, and referring to FIG. 2, they consist of an outer layer 23 formed of a woven synthetic fiber, such as nylon having a gabardine, taffeta, etc., weave, a lining 24 formed of a thin plastic impervious film such as "Mylar" having a

vacuum deposited reflective aluminum coating 24a and an interposed layer of thin batting material 25, such as polyester fiber. The liner 24 is essentially a nonstretchable material as opposed for example to a usual knit or woven fabric and accordingly tends to make the garment 10 relatively loose fitting particularly in the area where the heating element 13 is positioned such that normally this area is insulated from the body of the wearer by an air space. The relatively stiff layer 25 also tends to prevent the garment from being form fitting. The garment is preferably formed from flat pieces of the layers 23, 24 and 25 cut to shape with the only seams being the seams 20 and 21 while stitching also extends about the periphery of the garment to secure the three layers together.

To enhance the effect of the heating element 13 to the user, the present invention provides specifically a strip of elastic material 28 that is sewed at the opposite ends of the heating element in a stretched condition as at 28a and 28b. When released, the strip returns to its original length to cause gathering or bunching to occur in the garment adjacent thereto. Preferably, as shown in FIG. 3, the bias tape 17 extends beyond the heating element and overlays the strip 28. The elastic strip is of one piece to extend beneath the heating element such as shown at 28c in FIG. 2 where it is not normally stretched when sewed in position.

In both FIGS. 2 and 3, a pair of spaced parallel lines of stitching 30 pass through the bias tape 17 to the outer shell 23 to secure the heating elements, associated parts and elastic strip together.

The garment is formed with a front pocket, indicated generally by the reference numeral 31, which is adapted to hold a source of electrical energy such as a pair of batteries 32 (though just one may be used if desired). The wires 18 and 19 are releasably connected to the batteries as by releasable, electrical connectors, with the batteries being held in a conventional battery holder 32a. The wires extend from the pocket 31 through a slit 33 formed in the garment to enter beneath the bias tape 17 where they are contained by the stitches 30 as they extend to be connected to the ends of the heating element 13.

Referring to FIG. 4, there is pictorially shown a user with the heating element portion of the garment being positioned thereon as it would be when the vest is worn. It will be understood that the heating element 13 serves to localize its heat in the area of the small of the wearer's back which is the area below the rib cage but above the hips. It has been found that this is an extremely sensitive area to the presence of heat and by the localizing of the heat thereat, its effect is more pronounced to the user. The elastic strips 28a and 28b are transversely aligned with the heating element and serve to compress at least the portion of the garment having the heating element against the used to assure that maximum heat transfer will occur. Thus the strip 28 may extend somewhat around the sides of the user.

The specific layers of material which form the garment have been found to be extremely high in insulating value to minimize heat loss, especially the use of the plastic film liner 24 combined with the layer of batting material 25. The film 24 is moisture and air impervious, and it has been found desirable to provide a plurality of small perforations therethrough, as for example the perforations 24c. The size of the perforations and their number may be selected as found most preferable with the use of  $\frac{1}{16}$  inch diameter perforations and  $\frac{3}{16}$  inch center distance being one example thereof. The batting, by reason of its plastic or latex spray or dip coating does not tend to have loose fibers that extend through the holes.

In one example of the present invention, the heating element is 10 inches long,  $\frac{1}{8}$  inch wide, .005" thick and formed of an electric resistance material known as "Chromee." Naturally, the shape of the wire may vary therefrom within the scope of the present invention but yet its shape must be such as to maintain the localizing

of the heating at the sensitive area of the back where nerves are relatively close to the skin surface.

With respect to the lining 24, one material that has been found extremely satisfactory is sold under the trade name "Astrolon" by The Norton Co., Winchester, Mass. It is composed of two very thin (.001 to .002 inch thick) sheets of bonded together plastic film with a grid of nylon or fiber glass cords secured therebetween to add reinforcement and tear strength to the plastic liner. As to the batting layer 25, one satisfactory material is sold under the trade names "Interfill" and "Lina-fill" by Fiberfill, Inc., New York, N.Y. It is composed of 100% polyester fibers that are bonded together in a fluffy state by either a dip coating or a spray coating of hardened bonding material such as a heat activated plastic or latex material. The batting is thus somewhat thick ( $\frac{1}{8}$  to  $\frac{1}{4}$  inch), resilient form retaining yet somewhat stiff and of high insulating value.

It will accordingly be understood that there has been disclosed a garment which not only serves to prevent loss of body heat but also includes a heating element for adding to the body heat. The element is energized from a small portable battery and converts the electrical energy into heat only where the heating element extends. To achieve maximum utilization of the heat, it is caused to be localized just at a sensitive area of the wearer's back and to be urged into contact with the wearer to assure direct heat transfer.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. An electrically heated body garment having a portion adapted to overlie a sensitive area at the small of the back of a wearer, an electric resistance heating element including a thin relatively flexible elongate strip of electric resistance ribbon, said strip extending only transversely across the back at the sensitive area to localize the heat thereat, said garment normally being spaced away from the small of the back of the wearer, compression means at least adjacent opposite ends of the heating element to cause bunching of the garment to force said sensitive area of the garment against the small of the back of the wearer to effect heat flow therebetween and localize heating thereat, a portable source of electrical energy for said heating strip including a battery and electrical conductor means extending from said battery to said strip.

2. The invention as defined in claim 1 in which the compression means includes an elastic strip positioned adjacent either end of the heating element, said elastic means being sewed in a stretched condition to cause said bunching.

3. The invention as defined in claim 2 in which there is a fabric tape overlying the elastic strips and heating element, in which the tape is secured to the garment by a pair of spaced apart stitches extending the length of the tape with the stitches passing through the heating element and the elastic strips and in which at least portions of the conductor means are disposed beneath the tape.

4. An electrically heated vest having a back part and a front part, said back part including a portion adapted to overlie the small of the wearer's back, said garment being formed of essentially nonstretchable material including a plastic film lining to have said portion spaced from the wearer's back, heating element means secured to said lining and adapted to extend transversely across only said small part of the wearer's back, said heating element means including an elongate ribbon of electrical resistance material, elastic means transversely aligned with said heating element means and serving to compress said portion of the garment against the wearer to force said heating element against said wearer's back, a pocket formed in the front part and adapted to hold a

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source of electrical energy and connecting means extending from said pocket to said ribbon.

References Cited

UNITED STATES PATENTS

1,820,602	8/1931	Dick	-----	219—527	X
2,391,352	12/1945	Schwartz	-----	2—93	
2,391,535	12/1945	Zelano	-----	2—93	
2,584,302	2/1952	Stein	-----	219—528	X
2,842,655	7/1958	Schwebele	-----	128—402	X
2,976,539	3/1961	Brown	-----	2—2	

5

6

2,982,105	5/1961	Akers.	
3,051,821	8/1962	Dion	----- 219—529
3,084,241	4/1963	Carrona	----- 219—211
3,183,868	5/1965	Shotsky	----- 112—420 X
3,407,818	10/1968	Costanzo	----- 128—384

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2—93; 128—402; 219—527, 529

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