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S. I. RUSSELL, JR

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ELECTRICALLY HEATED BLANKET

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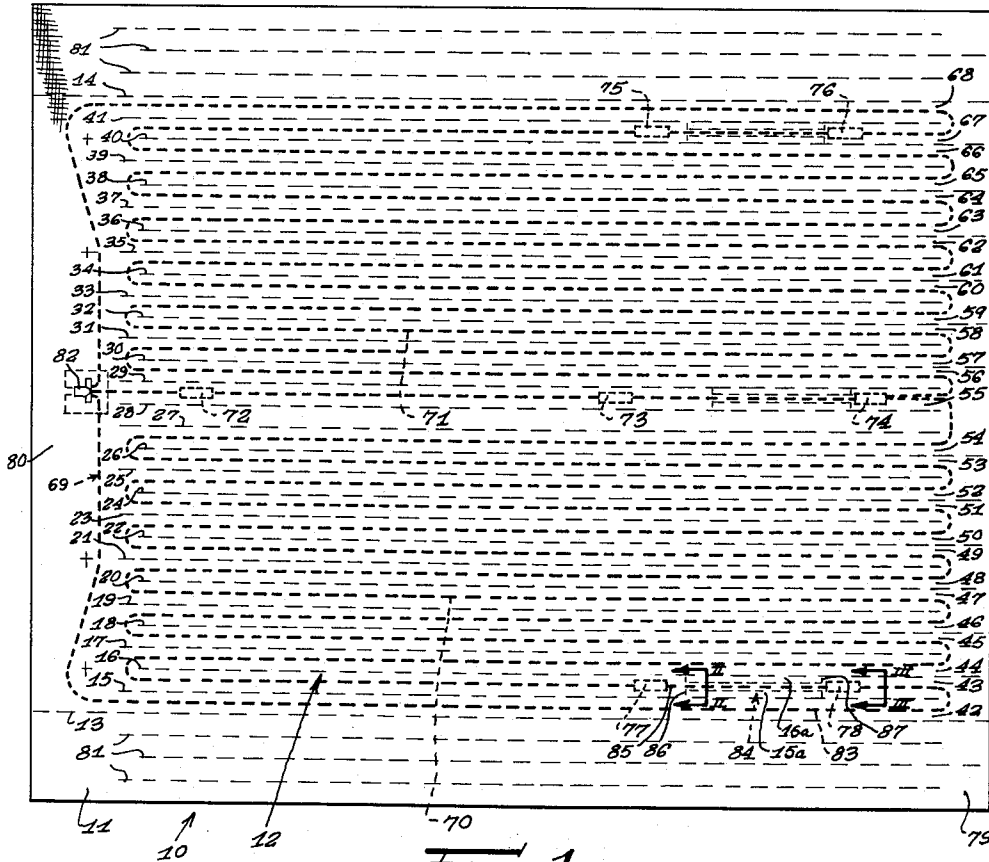


Fig. 1



Fig. 2

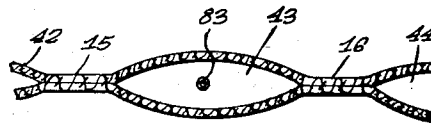


Fig. 3

Inventor
Samuel I. Russell, Jr.

By *Sill, Sherman, Merri, Gross & Simpson* Attys

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ELECTRICALLY HEATED BLANKET

Samuel I. Russell, Jr., Glenview, Ill., assignor to Northern Electric Company, Chicago, Ill., a corporation of Delaware

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This invention relates generally to electric blankets, and more specifically to an improved electric blanket shell incorporated therein, including the method of wiring it.

Although the principles of the present invention may be included in various heating appliances, a particularly useful application is made in electric blankets and pads.

Typical electric blankets comprise a woven cloth shell having a series of elongated channels woven therein and defined by dividers or stitching. This type of shell is well known in the art, being well illustrated and explained in the United States patent to Moberg, No. 2,203,918. In the manufacture of electric blankets, a heating wire, having temperature responsive switches located therein, is disposed in the various channels of the shell to define a heated portion. During the manufacture of the blanket, the heating wire is carried on and unwound from a shuttle which is passed through the various channels thereof.

After an electric blanket has been placed in service, it has not been uncommon for one or more temperature responsive switches therein to creep in location with respect to the shell. This is particularly true or aggravated when the user launders the blanket in a manner which effects shrinkage thereof. In the first instance, when the shell is wired, it is not practicable to pull the heating wire or harness into a taut condition because the blanket shell is so flexible and yieldable. Accordingly, there is some clearance or looseness provided during manufacture to insure that the blanket may be spread out smoothly. However, due to shaking of the blanket, laundering, and the like, and due to the fact that the switches in the shell each have an appreciable weight of greater density than the wire itself, there is a tendency for the harness to slip with respect to the blanket shell so that the various initial clearances, and so that the various further clearances produced by shell shrinkage tend to accumulate in one place, which place is usually associated with one of the switches because of the mass of such switch. Thus it has not been uncommon for a temperature responsive switch to work completely out of the channel in which it was disposed and into the end of the blanket shell.

It can be readily understood that when the switch has migrated or crept from its desired position, it can no longer sense the temperature at such position, and could conceivably even become disposed in an edge of the blanket which gets tucked under a mattress.

I have found that a better product can be provided if provision is made for insuring that the temperature responsive switches are carried by the blanket shell in a manner which precludes their drift or migration. Ordinary sewing as a mode of anchoring the switches with respect to the harness shell is unsatisfactory since it produces an unsightly appearance. However, I have found that the woven stitch or divider can be enlarged to define a restrictor within the channels where switches are to be located, for such switches to abut against.

Accordingly, it is an object of the present invention to provide an improved heating appliance shell adapted to limit the disposition of the switches.

Another object of the present invention is to provide a shell for an electric heating appliance wherein the position of the temperature responsive switch may be limited without sacrifice of a smooth external appearance.

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A further object of the present invention is to provide a method and means of disposing temperature responsive switches in a substantially permanent position within a shell.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheet of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

FIGURE 1 is a diagrammatic plan view of an electric heating appliance provided in accordance with the principles of the present invention;

FIGURE 2 is an enlarged sectional view taken along line II—II of FIGURE 1; and

FIGURE 3 is an enlarged sectional view taken along line III—III of FIGURE 1.

As shown on the drawings:

The principles of this invention are particularly useful when embodied in an electric blanket assembly such as illustrated in FIGURE 1, generally indicated by the numeral 10. The blanket assembly includes a shell 11, such as of woven fabric having a heated area generally indicated by the numeral 12 and defined by a pair of dividers 13 and 14. The heated area 12 is divided by other dividers 15—41 to define a plurality of channels such as 42—68 therein.

The blanket assembly 10 also includes an electric harness assembly generally indicated by the numeral 69, and which includes a pair of main heating wires 70 and 71 disposed in the various channels 43—67, and a plurality of temperature responsive switches 72—78 disposed in the channels 43, 55, and 67.

The shell 11 has a head edge portion 79, and a foot edge portion 80 which are ordinarily placed adjacent to the head and the foot of the bed respectively with which the blanket assembly 10 is used.

If desired, the shell 11 may have additional dividers 81 disposed along the sides of the heated area 12. The purpose of the dividers 81 is primarily aesthetic in that they provide a uniform appearance across the width of the blanket assembly 10.

The heated area 12 in the instant embodiment comprises in fact two heated areas, one extending from the divider 13 to the center, and the other extending from the divider 14 to the center.

Most of the dividers are of substantially uniform length, and are generally alternately staggered so that the heating wires 70 and 71 may be looped about the relatively recessed ends as it extends from one channel to the next.

The harness 69 is provided with a suitable plug assembly 82 by which the harness 69 is connected to a source of electrical power.

As explained above, the shell 11 comprises two layers of cloth which are conjointly woven, the two layers actually being stitched together by a weaving process during their manufacture as explained in the above identified Moberg patent. Thus FIGURE 3 is somewhat schematic, and represents a typical cross-sectional view across any one of the channels 42—68, except for portions indicated by line II—II which is schematically shown in FIGURE 2.

For simplicity, each of the dividers shown in FIGURE 1 has been represented as a mere line. Actually, it has a finite width, as illustrated in FIGURE 3 by the numerals 15 and 16, an actual blanket typically having a divider 15 or 16 about one half inch wide each. The channel 43 therefore typically is about one and one-half inches in transverse length, or width intermediate the dividers 15 and 16. A piece of harness wire 83 connected to a

temperature responsive switch such as 78 can easily pass through the channel 43 since the typical transverse length or width of the switch 78 is one inch.

To limit the amount which a switch such as 78 can move, I have provided in accordance with the principles of the instant invention a restriction generally indicated by the numeral 84 which in this embodiment comprises a transverse enlargement of the dividers 15 and 16, indicated by the numerals 15a and 16a, and shown in FIGURE 2. In a typical embodiment, the transverse length or width of the channel 43 has been reduced to one-half inch, which size is sufficient to permit shuttling of heating wire therethrough, but which will clearly not permit the passage of the switch 78 therethrough.

An intermediate harness wire portion 85 connects the switch 77 to the switch 78 so that if the harness wire moves in one direction, the switch 77 engages an abutment or end 86 of the restriction 84, while if the wire moves in an opposite direction, the switch 78 engages the opposite end or abutment 87 of the restriction 84.

The length of the restriction 84 is ordinarily not critical, nor is the length of the wire portion 85, nor is the location of the restriction 84. However, jointly these items are critical to this extent that they coact with each other to insure that the switches 77 and 78 are disposed with respect to the heated portion 12 of the shell 11 at the desired point. Further, they are jointly critical so that the switch 78 and the switch 77 cannot by harness creepage become disposed in the head portion 79 or in the foot-portion 80 of the shell 11.

It is apparent that as many restrictors 84 may be provided as is necessary, the instant embodiment having three such locations. It is also apparent that a result similar to that shown in FIGURE 2 may be obtained where only one of the dividers 15 or 16 is enlarged by an amount to effect a corresponding reduction in channel size.

To wire the shell 11, one leg of the heating wire 70 is inserted from the left end of the channel 43 and at this time includes the switch 77 and the intermediate wire portion 85 which is passed through the restrictor 84. The shell is then slid to the left on the wire portion 85 so that the abutment 86 of the restrictor 84 engages the switch 77 and so that the end of the wire 85 projects out of the channel 43. The end of the wire 85 is then brought into association with the end of the wire 83 which ends are joined together by the switch 78 which is conveniently installed and connected at that time. When the switch 78 is fully connected, the shell is smoothed out or debunched to the right, whereby the switch 78 is drawn into the right end of the channel 43 to assume the position shown.

The switch 76 is installed in a manner the same as described for the switch 78. In like manner, the harness leg including the switches 72 and 73 is inserted into the left end of the channel 55, after which the switch 74 is similarly installed.

The switches 72-78 may comprise any suitable switch element, for example, of the type taught by Porter in his U.S. Patent No. 2,627,003, disposed and sealed within a suitable water-tight covering. In the dimensional illustration given above, the dimension of the switch of course refers to the dimension of the water-tight covering thereof.

By providing the blanket shell 11 with my novel restrictor, means has been provided for limiting the disposition of the temperature responsive switch to a desired part of a selected channel.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. In an electric heating appliance shell having a series

of laterally spaced woven dividers defining a plurality of channels for receiving heating wire including wire having a temperature responsive switch of enlarged size therein, the improvement of: a restrictor in one of said channels, said restrictor comprising a woven part of at least one of said woven dividers which restrictor is of such size and configuration as to reduce the effective size of one of said channels to permit free passage of said wire therethrough, and to preclude passage of said switch therethrough.

2. In an electric heating appliance shell having a series of laterally spaced woven dividers defining a plurality of channels for receiving heating wire including wire having a temperature responsive switch of enlarged size therein, the improvement of: a restrictor in one of said channels, said restrictor comprising a woven lateral enlargement of each of a pair of said woven dividers adjacent to each other, the enlargements of said dividers being directed toward and laterally spaced from each other by such a distance as to permit free passage of said wire therebetween, and to preclude passage of said switch therebetween.

3. In an electric heating appliance having a shell, said shell having a series of laterally spaced woven dividers defining a plurality of channels, and a heating wire including wire disposed in one of the channels, the improvement of: at least one temperature responsive switch connected to said wire, of a size larger than said wire, and disposed in said one channel; and a restrictor comprising a woven part of at least one of said woven dividers which restrictor is of such size and configuration as to reduce the effective size of said one of said channels to permit free reception and passage of said wire therethrough, and to abut said switch to preclude passage of said switch therethrough.

4. In an electric heating appliance having a shell, said shell having a series of laterally spaced dividers defining a plurality of channels, and a heating wire including wire disposed in one of the channels, the improvement of: a pair of temperature responsive switches disposed in said one channel, and connected to said wire in series and spaced from each other by a portion of said wire intermediate said switches; and a restrictor comprising a part of at least one of said dividers, which restrictor is disposed between said switches, which restrictor is of such size and configuration as to reduce the effective size of said one of said channels to permit free reception and passage of said wire therethrough, and to alternatively abut either one of said switches to preclude passage of said one switch therethrough.

5. In an electric heating appliance having a shell, said shell having a series of laterally spaced dividers defining a plurality of channels, and a heating wire including wire disposed in one of the channels, the improvement of: a pair of temperature responsive switches disposed in said one channel, and connected to said wire in series and spaced from each other by a portion of said wire intermediate said switches; and a restrictor comprising a part of at least one of said dividers, which restrictor is disposed between said switches, which restrictor is of such size and configuration as to reduce the effective size of said one of said channels to permit free reception and passage of said wire therethrough, and to alternatively abut either one of said switches to preclude passage of said one switch therethrough; said restrictor being of such length and so disposed along the length of said one channel that when one of said switches is in engagement therewith, the other of said switches is restrained by said wire intermediate said switches to be disposed within said one channel.

6. In an electric heating appliance having a shell, said shell having a series of laterally spaced dividers defining a plurality of channels, and a heating wire including wire disposed in one of the channels, the improvement of: a pair of temperature responsive switches disposed in said one channel, and connected to said wire in series and spaced from each other by a portion of said wire inter-

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mediate said switches; and a restrictor comprising a lateral enlargement of each of a pair of said dividers adjacent to each other, and disposed between said switches, the enlargements of said dividers being directed toward and laterally spaced from each other by such a distance as to permit free passage of said wire therebetween, and to alternatively abut either one of said switches to preclude passage of said one switch therebetween; said restrictor being of such length and so disposed along the length of said one channel that when one of said switches is in engagement therewith, the other of said switches is restrained by said wire intermediate said switches to be disposed within said one channel.

7. In a method of wiring a channelled shell of an electric heating appliance where the shell is provided with integral means for limiting switch disposition within one of the channels of the shell, the sequential steps of: inserting a harness leg having a first temperature responsive switch intermediate its ends into said one channel from one end thereof so that the leading end of the harness leg passes through said limiting means; sliding the shell onto the leading portion of said leg so that one side of the limiting means abuts said first switch and effects a bunching of the shell and the limiting means on said lead-

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ing portion intermediate said first switch and the end of said harness leg, and a projecting of said leg end from the other end of said one channel; connecting a harness wire to said leg end by means of a second temperature responsive switch in series therewith; and smoothening out the shell to draw said second switch into said other end of said one channel into a position adjacent to the other side of the limiting means for engagement therewith.

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