

Nov. 19, 1929.

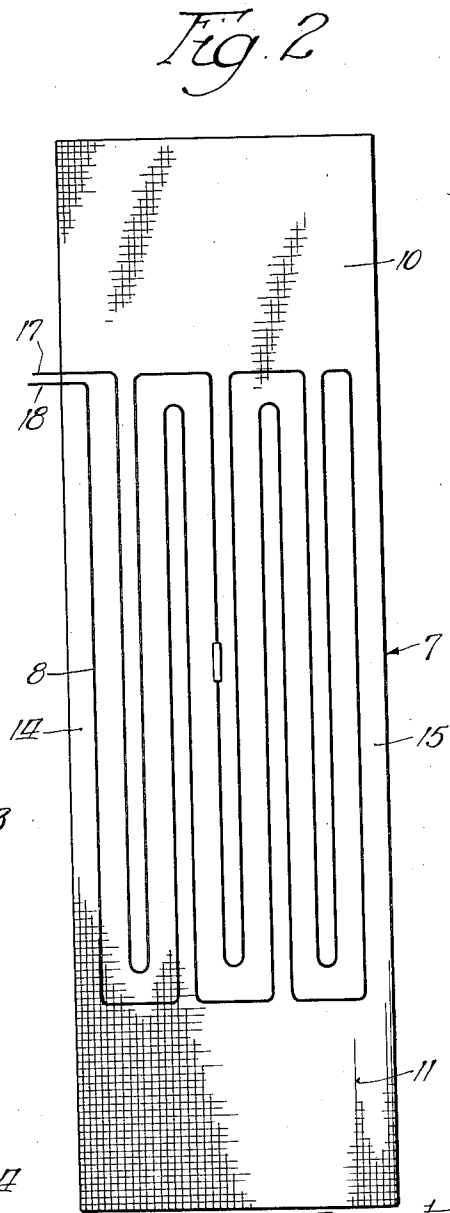
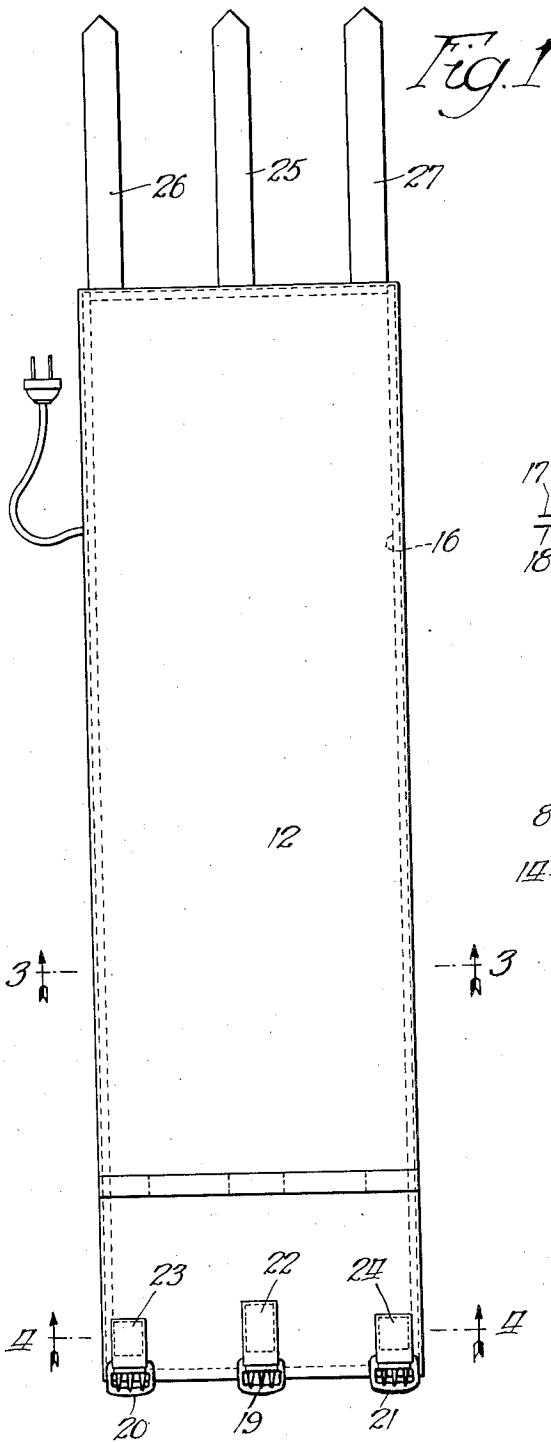
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ELECTRICALLY HEATED BELT AND THE LIKE

Filed May 9, 1927

2 Sheets-Sheet 1



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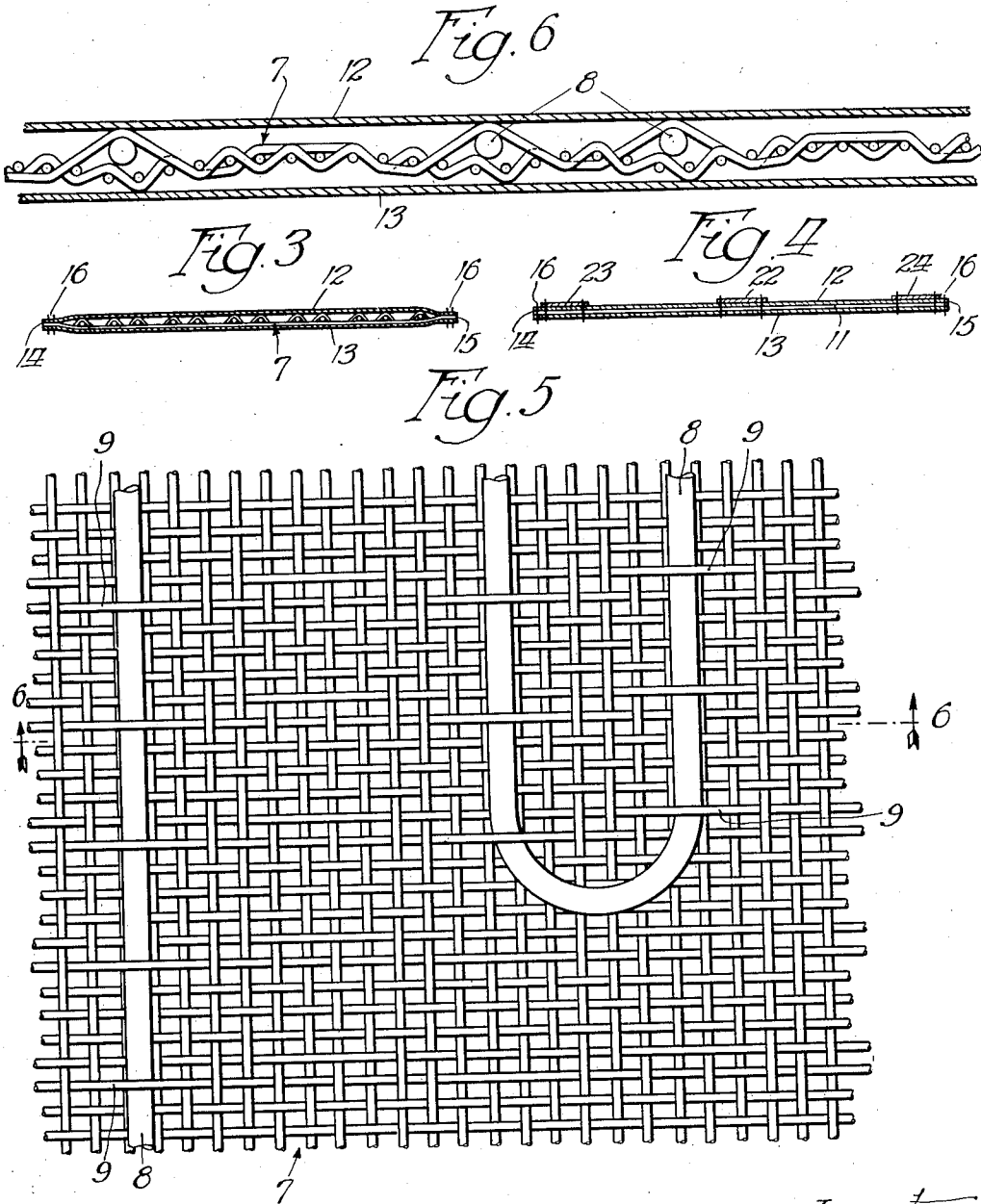
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ELECTRICALLY-HEATED BELT AND THE LIKE

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This invention has to do with improvements in electrically heated belts. The invention relates to an electrically heated belt adapted to be worn around the abdomen or other portion of the body, such as the arm, leg, waist or other portion, said belt being provided with suitable electric resistance conductors for creating the desired amount of heating effect locally and at the desired point.

One of the objects of the invention is to provide an article of the foregoing type which is of adjustable size so that it can be used on patients of different sizes.

A further object of the invention is to provide an article of the foregoing characteristics which has a central or body portion into which the heating conductors are woven, knitted or sewed or otherwise placed, which body portion is of sufficient mechanical strength to resist the tension to which it is automatically subjected in service, and without damage to the electrical conductors which are located thereon.

In connection with the foregoing it is a further object of the invention to also provide suitable surfacings in conjunction with said body portion so as to protect the same against wear and also to give the article a more finished and pleasing appearance. When such surface layers are used they also serve to increase the mechanical strength of the article and they serve as additional tension resisting means which will take up a portion of the strain to which the article is subjected in service.

A further object of the invention is to combine suitable buckles and straps or other similar connectors with the belt itself to thereby establish means for securing the belt in place on the wearer. These connectors are, when used, so attached to the fabric of the article that the strain is transmitted directly to the fabric without any interference with the conductors therein, and therefore without possible damage to the conductors.

Still another object of the invention is to secure all of the foregoing results in combination with the use of an electrical heating element comprising a fabric into or onto

which the electric conductors are placed in such a manner that a slight slippage or adjustment may take place from time to time between the conductors and the fabric in order to thereby compensate for strains imposed when stretching the belt in service, and at such times the slight slippage thus permitted will relieve the wires themselves of any strain. Furthermore the features of the invention may be used in conjunction with heating elements adapted to give either a single amount of heating action or two or more amounts of heating action in well understood manners.

Other objects and uses of the invention will appear from a detailed description of the same which consists in the features of construction and combination of parts hereinafter described and claimed:

In the drawings:

Fig. 1 shows a face view of a belt embodying the features of the present invention, the same being provided with suitable end strips and buckles;

Fig. 2 shows a face view of the heating element for the belt of Fig. 1, the showing in Fig. 2 being more or less diagrammatic;

Fig. 3 shows a cross section on the line 3—3 of Fig. 1 looking in the direction of the arrows but on enlarged scale;

Fig. 4 shows a cross section on the line 4—4 of Fig. 1, also on enlarged scale;

Fig. 5 shows a fragmentary face view of a portion of pad fabrication illustrated in the figures, being shown merely by way of illustration to show one form of heating element; and

Fig. 6 shows a fragmentary cross section on the line 6—6 of Fig. 5 looking in the direction of the arrows, and also shows top and bottom surface layers for protecting the surface of the belt.

Referring to the drawings, the belt therein illustrated includes a central heating element 7 into or onto which is placed a heating wire or wires 8. The heating element 7 comprises a suitable fabric, generally of rather coarse weave, and usually including warp and weft threads. The heating wire or wires 8 may either be woven into the fabric

or may be threaded into the same after the fabric has been woven, or may be sewed or otherwise attached to the face of the fabric. For example, in the arrangement of Figs. 5 and 6 the heating wire 8 is held in place by loops 9 which are portions of the fabric weave itself, and in this arrangement the wire is conveniently threaded into place by passing it through said loops after the fabric has been woven.

We will state however that it is particularly desirable to provide an arrangement in which the wires or passes of the wire 8 extend lengthwise of the fabric as shown especially in Fig. 2, and also an arrangement such that the fabric itself may stretch a slight amount lengthwise thereof, the wires being allowed to slip slightly so that the wires themselves are not subjected to any actual strain. In this way the tension exerted upon the belt when in service will not have any deleterious or bad effect upon the heating wires.

The heating wires 8 occupy the body portion of the fabric of the heating element, but there are left the end portions 10 and 11 of said fabric unoccupied by any heating wires. It is therefore possible to place sheets of surfacing material or cloth 12 and 13 against the top and bottom faces of the heating element, and it is possible to sew these surfacing sheets in place by sewing into and through the end portions 10 and 11 which are unoccupied by wires. In this connection it is also desirable to leave marginal portions 14 and 15 along the sides of the heating element also unoccupied by wires so that the stitch 16 may be carried entirely around the border of the article to attach the entire marginal portion of the surface sheets to the heating element without interference from the wires. In such case the wire terminals 17 and 18 may be brought out at points close together as shown in Fig. 2 and with the least possible amount of interference with the sewing.

Suitable buckles 19, 20 and 21 may be attached to one end of the article, said buckles being provided with tabs 22, 23, and 24 which can be sewed directly to the end portions of the article, the sewing passing through the facing sheets 12 and 13 and through the end portion 11 of the heating element. Likewise strips 25, 26 and 27 may be attached to the other end of the article in proper position for co-operation with said buckles when the belt is drawn around the patient's body.

From the above it will be apparent that we have provided a new article of manufacture comprising a belt or the like having a central heating element provided with suitable wires, the arrangement being such that the stretching of the fabric of the heating element itself will not damage the wires; and have provided in conjunction therewith suitable facing sheets, and also suitable attaching means connected directly to the end portions of the

article and beyond the positions of the wires so that the tensional strains are taken directly into the fabric and without damage to the wires.

While we have herein shown and described only a single embodiment of the features of our present invention, still we do not intend to limit ourselves thereto except as we may do so in the claims.

We claim:

1. As a new article of manufacture a therapeutic belt or the like comprising a relatively long and narrow heating element composed of a woven fabric together with suitable heating wires loosely woven therein with the strands of said heating element extending back and forth lengthwise of said heating element, said strands being capable of slight displacement lengthwise with respect to the heating element, together with suitable facings for the two faces of said heating element, said facings being connected to the end portions of the heating element, and suitable attaching means also connected to the end portions of the heating element beyond the positions of the wires therein, whereby the strains of tension in the heating element are absorbed by the fabric of the heating element independently of any strain on the heating wires due to the lengthwise displaceability of the wires in the heating element, substantially as described.

2. As a new article of manufacture a therapeutic belt or the like comprising a heating element composed of a suitable fabric together with heating wires in conjunction therewith and extending parallel to the length thereof and loosely connected to the weave of the fabric proper and capable of slight displacements lengthwise with respect to the fabric without strain on said wires, said wires terminating short of the ends of the fabric, together with suitable facings for the two faces of the heating element, and suitable attaching means in conjunction with the end portions of the heating element beyond the positions of the wires therein, whereby the tensional strains are absorbed by the weave of the fabric of the heating element and independently of the wires therein due to the lengthwise displaceability of the wires in the heating element, substantially as described.

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