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3,407,818

ELECTRICAL HEATING BELT

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Fig. 1

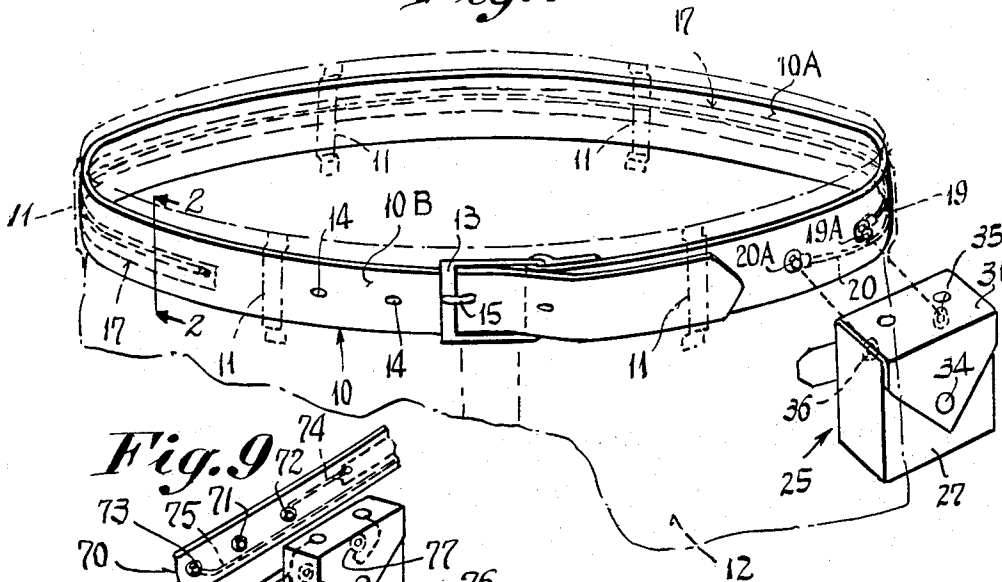


Fig. 2

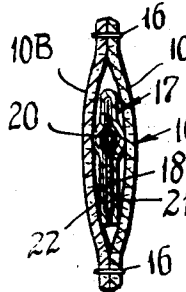
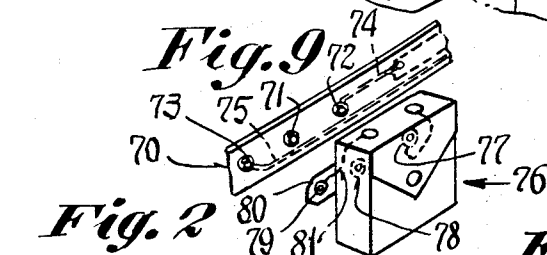


Fig. 3

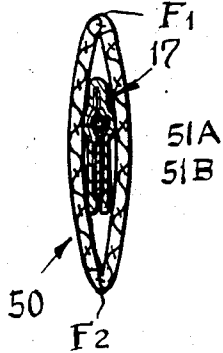


Fig. 4

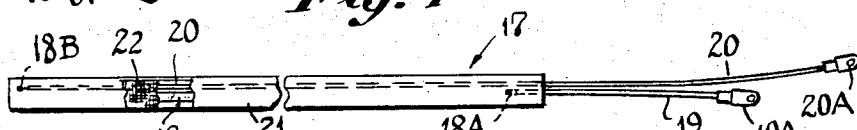


Fig. 6

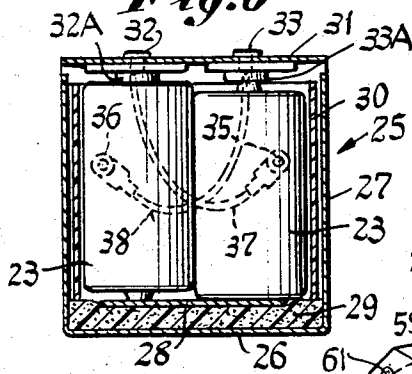


Fig. 7

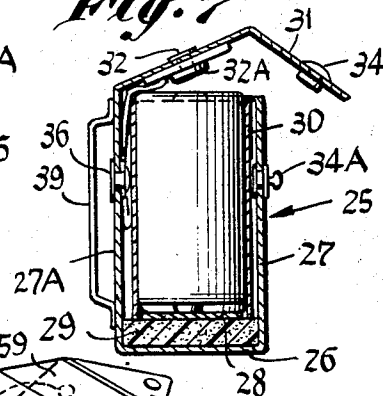


Fig. 5

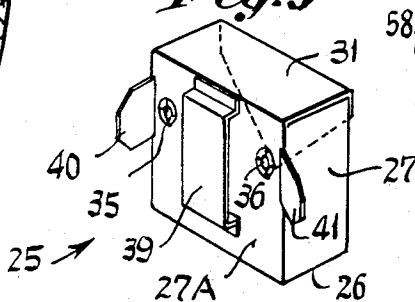
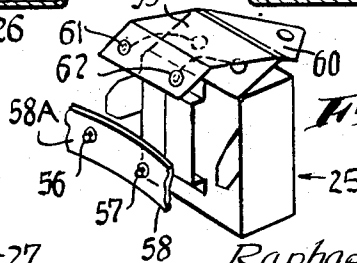


Fig. 8



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ELECTRICAL HEATING BELT
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ABSTRACT OF THE DISCLOSURE

An electrically heated belt including an elongated belt member adapted to be threaded through the conventional loops of a pair of trousers. A heater element in the belt member and low voltage battery for energizing said heater element and being detachably connected to said belt member.

This invention relates in general to an electrically heated belt, and more specifically to an electrically heated belt capable of being energized by a source of electrical energy of very low voltage.

It has been well established that the application of heat to the body has definite therapeutic value in aiding discomforts due to muscular aches, strains and/or stresses. Perhaps the most uncomfortable and painful type of muscular or physical discomfort is a back strain or ache which may be due to any number of causes. Also other body organs in and about the waist portion of the body frequently cause discomfort to a person, relief of which may be had by the application of heat.

Heretofore the application of heat to the waist portion and/or back portion of the human anatomy was possible only in the home where such heating apparatuses as hot water bottles, electrical heating pads, hot baths, and the like were readily available. For this reason, a person afflicted with such muscular aches and pains or other bodily discomforts which can be relieved by the application of heat could not normally obtain relief when such person attempted to pursue his normal daily activity or work.

It is therefore an object of this invention to provide an electrically heated belt which a wearer may wear in his trousers in the manner similar to that of a conventional belt, but which is capable of providing sufficient heat to warm the body and thereby aid in relieving discomforts due to muscular aches, strains and stresses.

Another object of this invention is to provide an electrically heated belt which has all the appearances and applications of a conventional belt, i.e. one which is capable of being threaded through the conventional loops of a pair of trousers, and which is also capable of transmitting heat to the body either for therapeutic value and/or merely for warming against the weather.

It is another object of this invention to provide an electrically heated belt which is energized by a source of electrical energy of very low voltage.

Another object of this invention is to provide an electrically heated belt which is arranged to be energized by a very low voltage source of electrical energy that can be carried directly on the belt.

Another object of this invention is to provide an electrically heated belt and a source of electrical energy for energizing the same and which source of energy is adapted to be detachably connected to the belt.

Another object of this invention is to provide an electrically heated belt which may be utilized either as a conventional non-warming belt or as an electrically heated belt depending on whether or not the source of electrical energy is connected in circuit therewith.

Another object of this invention is to provide an electrically heated belt having an improved heat construction

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which is rendered operative with a minimum amount of electrical power.

The foregoing objects and other features and advantages of this invention are attained by an electrically heated belt which comprises essentially an elongated member formed of any suitable belt construction material and which is preferably sized to be threaded through the conventional loops of a pair of trousers and to circumscribe the waist portion of the wearer in a conventional manner. Accordingly, the elongated member may be provided at one end thereof with a suitable fastener, such as a buckle or the like, by which the respective ends of the belt may be fastened or secured together.

In accordance with this invention, an electric heating means is connected to the elongated member of belt, and it is disposed with respect thereto to transmit heat to the waist portion of the wearer when the belt is worn and energized. The heating means is constructed to extend along the length of the elongated member and is specifically formed so that the same can be energized by a very low-voltage source of electrical energy. Means are provided for detachably connecting the source of electrical energy to the elongated member, and for electrically connecting and disconnecting the energy source into and out of circuit with the heating means. The heating means comprises an elongated resistor element having connected in heat transfer relationship therewith a radiation surface for enlarging the heating area of the heating means. In accordance with this invention the radiation means comprises a metallic foil connected to the resistor element in a manner to electrically insulate the metallic foil therefrom, but to render the same thermally conducted with the resistor element.

The means for detachably connecting the source of electrical energy to the belt means comprises a pouch arranged to accommodate a battery means as the low-voltage source of electrical energy. Complementary snap fasteners are provided on both the belt and the pouch so that the latter may be rendered detachably connected to the belt. In accordance with this invention the respective complementary snap fasteners are also wired to the heating means and source of electric power to effect electrical contact between the battery and the heating element of the belt when the pouch is connected to the belt. And a means in the form of closure flap for the pouch is operatively arranged to function as a switch means for making and breaking the circuit to the heating means.

A feature of this invention resides in the provision of a conventionally looking belt which can be electrically energized by a source of very low voltage for transmitting heat to the waist portion of the body.

Another feature of this invention resides in the provision in that the electrically heated belt can be fitted through the conventional loops of a pair of trousers.

Another feature of this invention resides in the provision in that the electrically heated belt may be optionally worn either as a conventional belt or as a heated belt.

Another feature of this invention resides in the provision that the heated belt permits one to continue the therapeutic heating of muscular afflictions in and about the waist and upper portions of the body while performing his normal routine duties away from home in a manner heretofore not possible.

Another feature of this invention resides in the provision that the heated belt may be utilized as a body warmer for maintaining the body warm on cold days.

Another feature of the invention resides in the provision of an electrically heated belt having a readily detachable pouch for supporting the battery required for energizing the heating element of the belt, and which pouch is constructed so that it can be readily attached or detached from the belt and which functions also to

connect and disconnect the batteries carried therein in circuit with the heating element of the belt.

Another feature of this invention resides in the provision of a heated belt utilizing a heating element provided with a radiation surface connected into heat transfer relationship therewith to transmit a maximum amount of heat in a uniform manner to the waist portion of the body.

Another feature of this invention resides in the provision in that the heating means by which the heat is generated is rendered readily flexible and capable of assuming any shape of which the belt is capable of assuming without adversely affecting the heating element.

Other features and advantages will become more readily apparent when considered in view of the drawings and the specification in which

FIG. 1 illustrates the electrically heated belt of this invention as applied to a conventional pair of trousers.

FIG. 2 is a sectional view taken through the belt along line 2—2 on FIG. 1.

FIG. 3 is a sectional view similar to that of FIG. 2, but of a slightly modified form of belt construction.

FIG. 4 is a detailed side view of the heating means by which the belt construction of FIGS. 1 and 3 is heated.

FIG. 5 is a perspective view of the pouch construction by which a source of electrical energy is rendered detachably connected to the belt.

FIG. 6 is a cross-sectional view of the pouch illustrating batteries installed therein.

FIG. 7 is a sectional side view of the pouch construction illustrated with the closure flap thereof in the open position.

FIG. 8 illustrates a modified detachable pouch construction.

FIG. 9 illustrates another modified construction.

Referring to the drawings, there is shown in FIG. 1 the electrically heated belt 10 of this invention which may be utilized either as a body warmer for maintaining the waist portion of the body warm in cold weather and/or climates and/or may be utilized as a therapeutic body warmer applying soothing heat to afflicted portions of the body in and about the waist area thereof. Consequently, it is to be noted that the heated belt 10 of this invention when worn as a therapeutic device will enable an afflicted person to apply or maintain heat to the afflicted waist portions of the body even as he goes about his normal daily activities and/or duties, as it will herein-after become more readily apparent.

As best seen in FIGS. 1, 2 and 4 through 7 the heated belt 10 comprises an elongated member sized to be readily threaded through conventional loops 11 of an ordinary pair of trousers 12 and which circumscribes the waist portion of a wearer. A conventional buckle means or other suitable fastener 13 may be connected to one end of the belt in the usual manner. The other end of the belt may be provided with suitable eyes or holes 14 for receiving the tongue 15 of the buckle 13.

In the illustrated form of the invention the elongated member or belt 10 may be formed of any suitable material, as for example leather, cloth, plastic, or belt webbing and the like. As shown, in FIG. 2, the elongated member or belt 10 is defined as a substantially flat tubular member composed of an inner portion or member 10A and an outer portion or member 10B which are suitably secured together as for example by stitching or a sewn seam 16. However, it will be noted that any other suitable means may be utilized to secure the respective inner and outer portions 10A, 10B of the tubular elongated member 10 together, as for example a suitable adhesive, or as by bonding or fusing in the event the belt material is made of a plastic or similar fusible material. Accordingly, the outer portion 10B of the belt 10 is formed with a suitable finished surface to provide for any suitable decorative surface. Thus, in appearance the belt 10 herein described

can have all the looks and appearance of a conventional belt.

In accordance with this invention the heating means 17 by which heat is generated and transmitted to the body of the wearer is disposed between the inner and outer portions 10A and 10B of the belt 10. Referring to FIG. 4 the heating means 17 comprises a relatively narrow flap resistor strip or element 18 which is adapted to extend along a substantial portion or length of the belt 10. As best seen in FIG. 1 the heater means 17 is arranged so as to circumscribe a major portion of the circumferential distance of which the belt is capable. One end 18A of the resistor element 18 is connected to a suitable electrical conductor 19, such as a suitable insulated coated wire. The other end 18B of the resistor element 18 is connected to another conductor 20 of similar insulated coated wire. As noted in FIGS. 1 and 4, the free end of the respective conductors or wires 19, 20 are electrically connected to a terminal or contact 19A, 20A. As best seen in FIG. 1 the terminal contacts 19A, 20A to which the respective conductors 19, 20 are connected are preferably formed as a male snap fastener. As disclosed in FIG. 1, the respective terminal snap fasteners 19A, 20A extend outwardly of the outer portion 10B of the flattened elongated tubular member or belt 10.

To enlarge the heating area of the resistor element and to uniformly distribute the heat over the length of the resistor element 17, a radiation member 21 is connected into heat transfer relationship thereto. As best seen in FIG. 4 the heat transmitting or radiation surface 21 comprises a strip of metallic foil suitably connected into heat transfer relationship to the resistor element 18. It is to be noted that the strip of foil may be adhesively coated or suitably anodized on one side thereof to electrically insulate the metallic foil 21 from the resistor element 18. In the illustrated form of the invention the strip of metallic foil 21 may be also backed with a loosely woven cloth backing 22, which cloth backing 22 is provided with a coating of adhesive material whereby the metallic foil may be adhesively secured to the resistor element 18.

Referring to FIG. 2 it is to be noted that the cloth-backed metallic foil 21 is reversely folded about the electrical resistor 18 to sandwich the resistor 18 therebetween. It will be understood that in lieu of reversely folding the adhesively backed foil 21 that two metallic foil strips may be secured in back-to-back relationship to sandwich the resistor element 18 therebetween.

It will be therefore noted that whenever the resistor is energized, as will be hereinafter described, the heat generated in the resistor 18 is uniformly transmitted to the metallic foil 21 connected thereto to provide an enlarged area of radiant heat.

The construction of the heater 17 is such that the same can be satisfactorily energized over a considerable period of time by a source of very low-voltage energy. The heated belt described can be energized by one-and-one-half volt dry cell batteries or the like. In the illustrated embodiment, two such batteries 23 are connected in series to generate the voltage required to energize the heater 17. Thus the source of electrical energy may comprise any suitable type battery. Small alkaline-type batteries have proven satisfactory.

In accordance with this invention, a means 25 is provided for detachably connecting the battery source 23 to the belt 10. By rendering the source of electrical energy detachably connected to the belt, it will be noted that the belt can then be optionally worn either as a conventional belt and/or as a heated belt when the battery source 23 is connected thereto. To detachably connect the source of electrical power 23 to the belt 10 the means 25 comprises a pouch constructed to receive the batteries 23. The pouch 25 is also constructed to connect and disconnect the source of electrical power 23 in circuit with the heating element 17 of the belt.

Referring to FIGS. 5, 6 and 7 it is to be noted that the

pouch 25 comprises a bottom wall 26 having connected thereto a circumscribing upright wall 27 to define a substantially rectangular pouch open at its upper end. Preferably, the pouch may be formed of any suitable material such as plastic or the like.

As shown in FIGS. 7 and 8 a plate contact 28 is resiliently supported on the bottom wall 26 of the pouch 25 by a layer of resilient material 29, such as foam rubber, sponge or the like. An envelope 30 formed of relatively rigid material as for example paper board, hard board, or the like is disposed within the pocket to add rigidity thereto and to shape the same. Connected to the back wall portion 27A of the pouch and/or formed integrally therewith is a flap 31 which is adapted to define the closure for the open end of the pouch 25.

Referring to FIGS. 6 and 7, a pair of contacts 32, 33 are connected to the portion of the flap 31 which defines the top portion of the pocket. A rigid button 32A, 33A or the like is disposed on the inner side of the flap 31 so as to insure positive engagement of the contact 32, 33 with the respective electrodes of the batteries 23 when the flap 31 is secured in its closed position by fastener 34. Connected to the back of the pouch 25 are a pair of complementary female snap contacts 35, 36 which are adapted to mate with the male contacts 19, 20 on the belt, and thereby function to detachably secure the pouch 25 to the belt. Suitable wire conductors 37, 38 are connected between the button contacts 32, 33 on the flap 31 and the snap contacts 35, 36 connected to the back 27A of the pouch 25. As best seen in FIG. 6 the arrangement of the conductors 37, 38 is such that the batteries 23 are connected in series to the heating element 18 of the belt 10 when the flap 31 of the pouch 25 is secured in the closed position, as seen in FIGS. 1, 5 and 6. The snap fastener 34 secured to the free end of the flap 31 is arranged to complement a mating fastener 34A secured to the front wall of the pouch. Accordingly, it will be noted that whenever the flap 31 of the pouch 25 is secured in its closed position, as best seen in FIGS. 1, 5 and 6, the button contacts 32, 33 on the top portion of the flap are disposed into contacting relationship with the respective batteries. Accordingly by securing the snap contacts 35, 36 of the pouch 25 to the mating snap contacts 19, 20 of the belt 10, it will be noted that the batteries 23 are connected in circuit with the heating element 18 thereof. Accordingly, it is to be noted that the flap 31 functions as a switch for making and breaking the circuit between the batteries 23 and the heating element in the belt.

As best seen in FIG. 5, the back 27A of the pouch 25 is provided with a loop 39 through which the belt 10 may be threaded for positively supporting the pouch to the belt. Thus, the loop 39 on the back of the pouch 25 together with the snap action of the snap contacts 19, 20 and 35, 36 firmly secures the pouch 25 to the belt 10.

As best seen in FIG. 5 a pair of flap ears 40, 41 are connected to the back 27A of the pouch. Normally, in the detached position of the pouch 25, the ears 40, 41 are arranged to shield or cover the snap contacts 35, 36. The purpose of the ears 40, 41 in shielding the snap contacts 35, 36 is to prevent shorting out of the batteries within the pouch in the event that the pouch, when detached, is inadvertently placed on a metal surface or object as for example a metal piece of furniture or the like. In the event of such inadvertence, the flap ears 40, 41 function to prevent insulating terminals 35, 36 in the event of such accidental placement.

FIG. 3 illustrates a slightly modified form of the invention. In this form of the invention the belt 50 is defined, e.g. by a single piece of cloth or webbing which is folded along longitudinally extending fold lines F_1 and F_2 along the upper and lower edges of the belt 50 with the free end 51A, 51B of the web secured in contiguous relationship to define a substantially flat tubular member. In all other

respects the belt construction, heater means 17, and pouch construction are similar to that hereinbefore described.

FIG. 8 illustrates a modified pouch construction 55. In this pouch arrangement, the snap terminals 56, 57 on the belt 58 (similar to that described) are arranged to project inwardly through the inner portion 58A of the belt construction. With this construction it is to be noted that whenever the belt is to be worn as a conventional belt and without the battery pouch 55 connected thereto, the snap contacts 56, 57 are not rendered visible.

To accommodate the inside location of the snap fasteners 56, 57 the battery pouch 55 has been modified as indicated in FIG. 8. In the modified construction, the pouch 55 illustrated is substantially similar to that hereinbefore described with the exception that an auxiliary flap 59 is secured to the closure flap 60 in the manner indicated. Accordingly, the auxiliary flap 59 is arranged to secure the pouch 55 to the belt 58 by overlapping the auxiliary flap 59 to the inside of the belt as noted in FIG. 8. In this event the auxiliary flap 59 has connected thereto the mating contact snap 61, 62 by which the batteries 23 are electrically connected into circuit with the terminal snap fasteners 56, 57 on the belt to connect with the heating element.

In all other respects the operation and construction of the pouch construction 55 in FIG. 8 are similar to those herein described.

From the foregoing it is to be noted that the belt constructions herein described in outward appearance look like a conventional belt. However, with this invention the belt is heated by a heating element which is specifically constructed and arranged to be energized by a very low source of electrical energy, preferably by an electrical source of less than six volts, and more likely three volts. Also the arrangement of the heating element is such that the radiation means is provided to uniformly distribute the heat over an enlarged area, and thus insure a maximum amount of heat being transmitted or radiated to the body of the wearer. Accordingly, the belt may be utilized either as a body warmer and/or for a therapeutic value to relieve muscular aches and pains in and about the waist portion of the body.

FIG. 9 illustrates another modified construction. In this form of the invention the belt 70 is similar in construction to that of FIG. 1 with the exception that an additional fastener 71 is disposed between fasteners 72 and 73, the latter two being connected by electrical conductors 74 and 75 in circuit with the heating means.

The pouch construction 76 adapted for use with belt 70 is similar to that of FIG. 1 except that only one button fastener 77 on the back of the pouch 76 is connected by electrical conductors in circuit with the batteries. The other fastener 78 is not electrically connected in circuit to the battery. As such, fastener 78 is utilized to merely complement fastener 71 to function as a mere means only of securing the pouch to the belt.

In this form of the invention another contact fastener 79 is placed on the ear 80 connected to the pouch and fastener 79 is connected in circuit with the batteries by a suitable conductor 81. Contact fastener 79 is arranged to complement the other fastener 73 of the belt in the assembled position of belt 70 and pouch 76.

With the construction of FIG. 9 described, it will therefore be apparent that complementary contact fasteners 73 and 79 will function as an "on-off" switch for the heater means of the belt. In operation, with the pouch secured to the belt by complementary fasteners 71, 78 and 72, 77 it will be noted that the heater of the belt will not energize until contact fasteners 73, 79 have been closed or fastened. Thus, the wearer by merely snapping and un-snapping contact fasteners 73, 79 can control the energization of the belt heater H.

While the invention has been described with respect to various embodiments thereof, it will be understood and appreciated that variations and modifications may be made

without departing from the spirit or scope of the invention.

What is claimed is:

1. An electrically heated belt comprising:
 - (a) an elongated member adapted to be threaded through the conventional trouser loops that are circumferentially spaced about the waist portion of a pair of trousers, and said member being sized to circumscribe the waist portion of the wearer of said trousers,
 - (b) an electric heating means connected to said elongated member and disposed to transmit heat to the waist portion of the wearer,
 - (c) said heating means being substantially coextensive the length of said elongated member so as to extend about a waist portion of the wearer,
 - (d) a low-voltage energy source for energizing said heating means,
 - (e) and means for detachably connecting said energizing source to said elongated member, and for electrically connecting said energy source to said heating means,
 - (f) and a buckle means connected to one end of said elongated member for securing the other end of said belt in the operative position thereof.
2. The invention as defined in claim 1 wherein said elongated member comprises:
 - (a) a flat tubular member having an outer portion and a connected inner portion,
 - (b) and said electrical heating means being disposed between said inner and outer portions.
3. The invention as defined in claim 1 wherein said heating means comprises:
 - (a) a relatively narrow, flat resistor element extending along said member,
 - (b) and a radiation means connected in heat transfer relationship to said flat resistor to expand the heating surface of said resistor.
4. The invention as defined in claim 3 wherein said radiation means includes a strip of adhesively backed metallic foil, said adhesive functioning to electrically insulate said foil from said resistor.
5. The invention as defined in claim 4 wherein said foil includes a first and second portion adhesively secured in back-to-back relationship to sandwich therebetween said resistor.
6. The invention as defined in claim 3 and including
 - (a) a pair of conductors connected in circuit with said resistor,
 - (b) and a pair of snap contacts connected to said member to function as terminal for the free end of said conductors.
7. The invention as defined in claim 6 wherein said means for detachably connecting said energizing source to said member and for electrically connecting said energy source to said heating means comprises:
 - (a) a pouch for receiving the low-voltage energy source,
 - (b) a flap closure for said pouch,
 - (c) a pair of contacts connected to said flaps for effecting electrical contact with said energy source,
 - (d) and said pouch including complementary snap contacts to mate with the snap contacts of said member to connect said energy source in circuit with said heating means,
 - (e) and conducts connecting said pair of contacts with said complementary snap contacts of said pouch.
8. The invention as defined in claim 7 wherein:
 - (a) said terminal snap contacts of said member extend outwardly of said outer portion thereof, and
 - (b) said pouch has a loop connected thereto through which said member is threaded to positively support the pouch thereon.
9. The invention as defined in claim 7 wherein:

- (a) said terminal snap contacts extend to the inner portion of the elongated member,
- (b) and said pouch includes an auxiliary flap for the complementary snap contacts arranged to mate with the snap contacts of said member.
10. The invention as defined in claim 7 wherein said pouch includes ear flaps connected thereto and adapted to shield said complementary snap contacts from shorting out when the pouch and energy source contained therein are detached from said member.
11. The invention as defined in claim 7 wherein:
 - (a) a contact plate is disposed in the bottom of said pouch,
 - (b) and a resilient means supports said contact plate on the bottom of said pouch.
12. An electrically heated belt adapted to be threaded through the loops of a conventional pair of trousers comprising:
 - (a) an elongated flat tubular member having an outside portion for defining the finished surface of said belt and a connected inside portion,
 - (b) an electrical heating means disposed between the inner and outer portions of said tubular-like member to impart heat thereto,
 - (c) said heating means including a relatively narrow flat resistor element extending along said member,
 - (d) a radiation means connected in heat transfer relationship to said flat resistor to expand the heating surface of said resistor,
 - (e) means electrically insulating said radiation means from said electrical resistor,
 - (f) a pair of electrical conductors operatively connected in circuit with said resistor,
 - (g) a pair of snap contacts connected to said tubular member to define terminals for the free ends of said pair of conductors,
 - (h) a low-voltage battery for energizing said heating element,
 - (i) means for detachably supporting said battery directly on said tubular member and for electrically connecting said battery in circuit with said heating means,
 - (j) said latter means including a pouch defined by a bottom wall portion and a connected circumscribed upright wall portion for supporting said battery therein,
 - (k) a bottom contact plate disposed at the bottom of said pouch,
 - (l) means for resiliently supporting said contact plate in said pouch,
 - (m) a flap connected to said pouch to define a closure for the upper end thereof,
 - (n) a pair of contacts connected to said flap for effecting electrical contact with the electrodes of said battery means in the closed position thereof,
 - (o) a pair of complementary snap contacts operatively connected with said pouch for detachably mating with the terminal snap contacts of said belt,
 - (p) and conductors electrically connecting said pair of contacts in circuit with said pair of complementary snap contacts whereby said heater means is energized when said pouch and battery supported therein is attached to the terminal snaps of said belt and the flap of said pouch is closed,
 - (q) and means for securing the flap of said pouch closed to connect said battery in circuit with said heating means.
13. The invention as defined in claim 12 wherein said radiation means includes a strip of metallic foil, and said means for electrically insulating said foil including a cloth backing for said foil, and said cloth backing being adhesively coated whereby said cloth-backed foil is connected to said resistor so as to be electrically insulated and thermally conductive with respect thereto.
14. The invention as defined in claim 13 wherein said

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resistor is sandwiched between portions of said cloth-backed metallic foil disposed in back-to-back relationship.

15. The invention as defined in claim 12 wherein said pair of snap contacts connected to said tubular member extend outwardly of the outside portion thereof, and said pouch having complementary snap contacts connected to the back portion of the pouch whereby the mating of snap contacts detachably secures the pouch to the tubular member.

16. The invention as defined in claim 12 wherein:

- (a) said pair of snap contacts are connected to the inside portion of said tubular member,
- (b) and said pouch includes an auxiliary flap connected to said closure flap,
- (c) complementary snap contacts connected to said auxiliary flap whereby the mating of said snap contacts detachably connects the said pouch to said tubular member.

17. The invention as defined in claim 5 and including

- (a) a fastener means disposed between said snap contacts,
- (b) and a pouch for containing a battery,
- (c) said pouch including complementary snap contacts

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for mating with the snap contacts of said belt to close the circuit to the heating means, and

- (d) a complementary fastener to mate with said belt fastener.

18. The invention as defined in claim 17 wherein one of said snap contacts functions as an "on-off" switch for said heater.

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