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Hines et al.

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[54] **ELECTRICALLY HEATED BOOT SOCK
AND BATTERY SUPPORTING POUCH
THEREFOR**

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[51] Int. Cl. **H05b 1/00**

[58] Field of Search **219/211, 527, 528, 529;
36/2.6; 136/161, 181**

[56] **References Cited**

UNITED STATES PATENTS

3,249,108 5/1966 Terman.....219/211 X

3,534,391	10/1970	Bauer	219/211
1,275,451	8/1918	Lillard	36/2.6
1,702,583	2/1929	Williams	219/526 X
3,293,405	12/1966	Costanzo	219/211
3,392,264	7/1968	Arron	219/527 X
3,396,264	8/1968	Murphy et al.	219/211

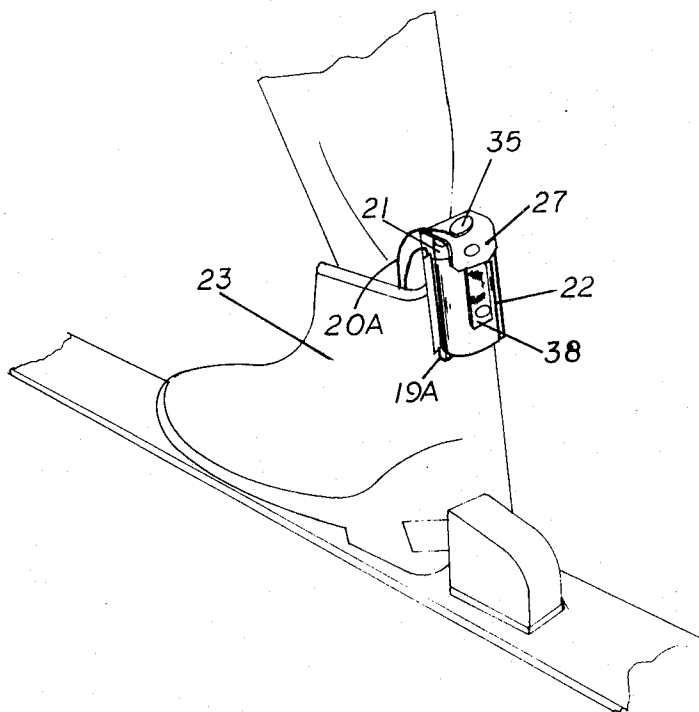
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[57] **ABSTRACT**

This disclosure is directed to an electrically heated boot sock and a pouch construction therefor for holding the battery. The pouch is constructed of foldable sheet material arranged to define a battery pocket and associated closure flap with contacts arranged to make positive electrical contact with the battery when the flap is closed. The pocket is formed to define a channelway extending along one side thereof through which a conductor connecting with one of the contacts is threaded, and a hooking means is attached to the pocket for detachably connecting the battery pouch to the boot of the wearer.

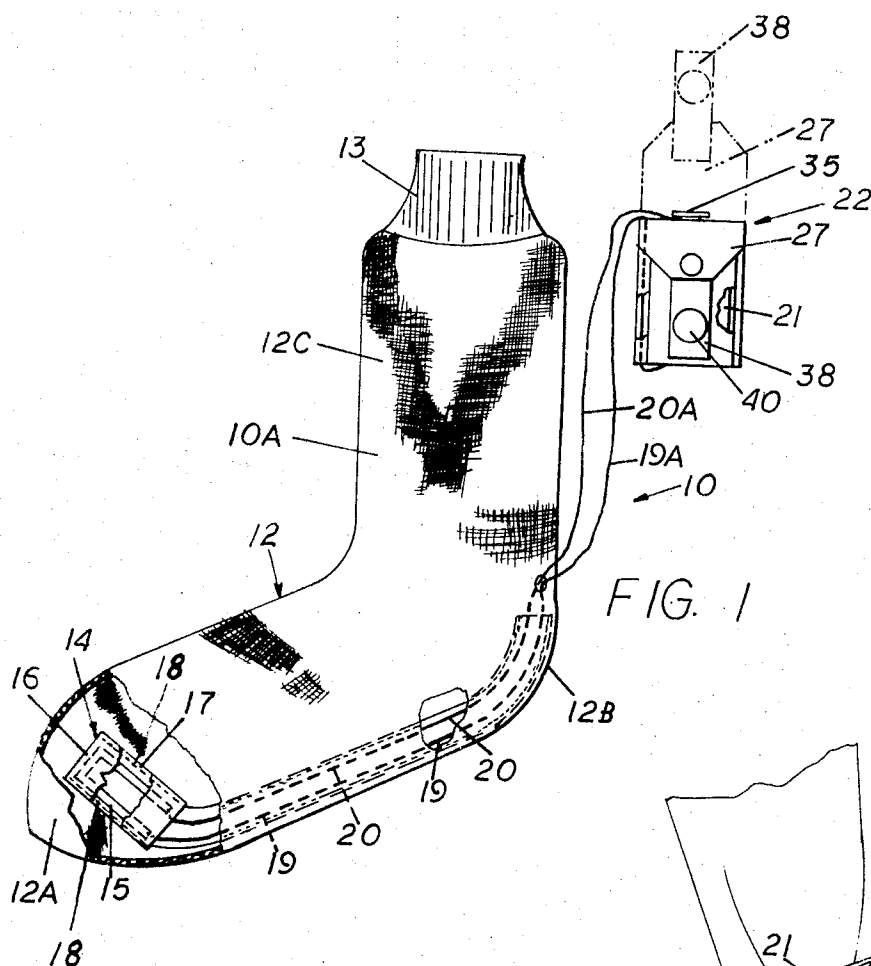
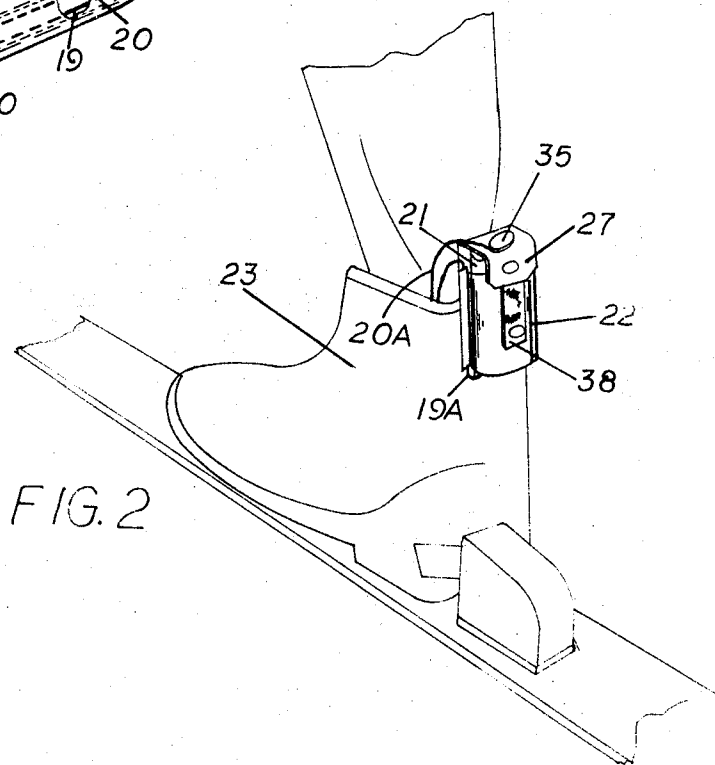
11 Claims, 6 Drawing Figures



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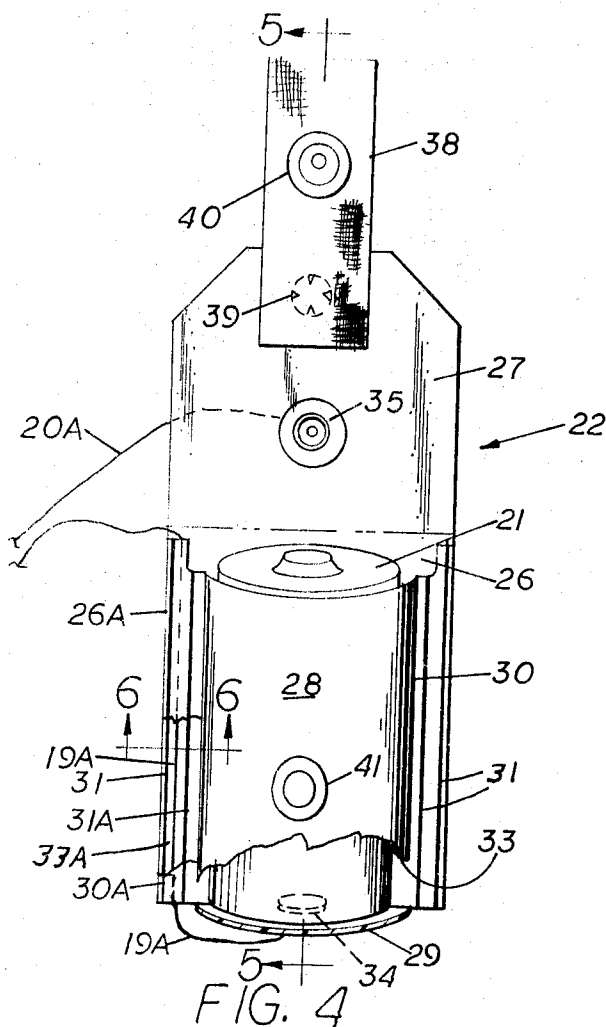
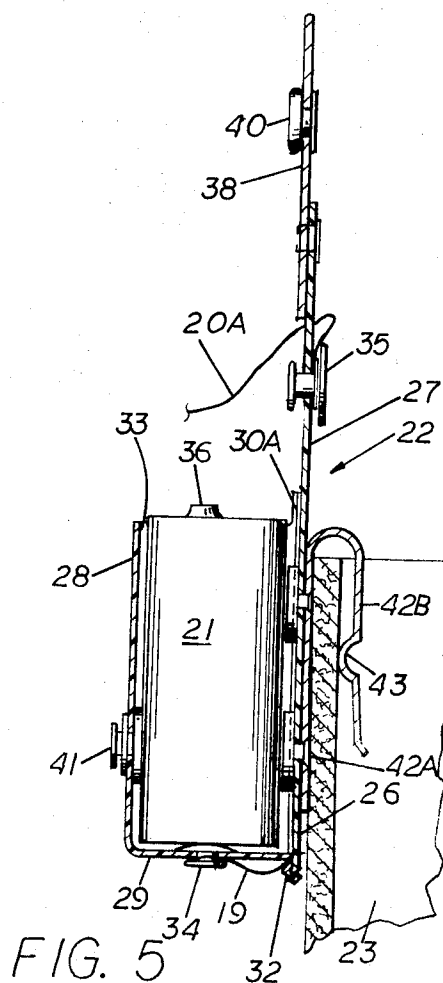
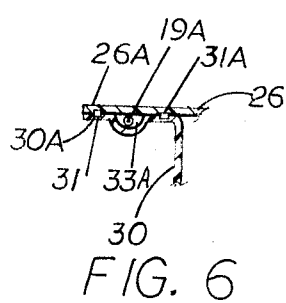
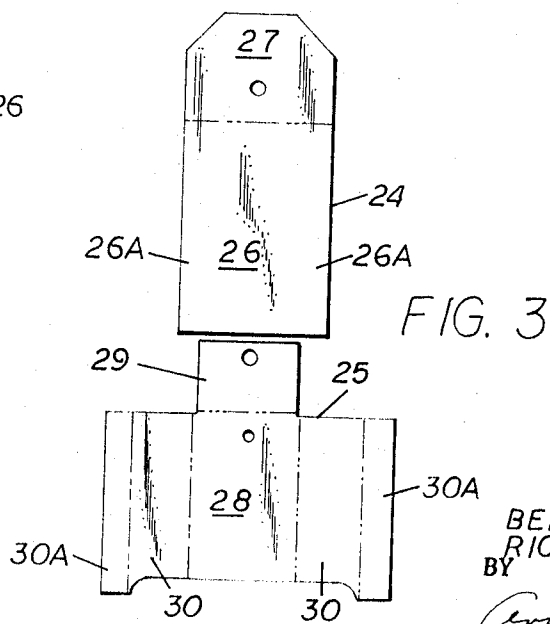
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ELECTRICALLY HEATED BOOT SOCK AND BATTERY SUPPORTING POUCH THEREFOR

PROBLEMS AND PRIOR ART

In the construction of low voltage, battery operated, electrically heated socks of the wholly self-contained type, it was heretofore customary to support the battery in a pouch which was either sewn to the sock adjacent the upper end thereof or strapped to the leg of the wearer immediately adjacent the hem of the sock. In either event a strap or garter was necessarily associated with the pouch which the wearer had to fasten about his leg in order to support the weight of the battery. While the battery supported in such strapped pouch comprises a relatively small, standard 1½-volt dry cell flashlight type battery, it nevertheless produced a bulge which frequently interfered with the wearer's other articles of clothing, e.g., ski pants, camping boots, ski boots, and the like.

Because ski pants are generally formed of elastic material designed to stretch tight to the wearer, it was difficult for one to wear such ski pants over the battery pouch arrangement heretofore used in conjunction with such low voltage socks. Invariably the ski pants worn over such socks resulted in an unsightly bulge or interfered with the pouch and/or the operation thereof. For example, where the flap of the pouch was employed as a switching means to energize and/or de-energize the circuit to the electric heater, access to such flap switch was rendered virtually impossible when worn under the conventional ski pants. Consequently the wearer of such ski outfits could not effect satisfactory control over the electric socks. As a result such socks were required to remain energized when there was no need therefor; e.g., when a skier moved to indoor activities and/or when the weather warmed up.

Also because most ski pants and/or outfits comprise highly styled clothing, the protrusion or bulge created by the known battery pouch holders when worn under such ski pants was highly undesirable to the fashionable skier.

OBJECTS

It is therefore an object of this invention to provide a low voltage electrically heated sock of the self contained variety having an improved pouch construction which is specifically adapted to be worn with ski type clothing, and/or ski boots or camping boots.

Another object is to provide an improved pouch construction for use with battery powered self contained type of electric socks which can be at all times controlled by the skier or wearer.

Another object is to provide an improved pouch construction for electrically heated battery powered socks having reinforced or strengthened terminal connectors.

Another object is to provide a pouch construction with a channelway through which an electrical conductor is threaded so as to minimize any break in the circuit due to a snag or pull.

Another object is to provide an improved pouch construction for a self contained, low voltage, battery heated sock which will not adversely effect the styling and/or appearance of ski clothes.

Another object is to provide an electrically heated sock in which the battery support is attached to the boot of the wearer.

BRIEF SUMMARY OF THE INVENTION

The foregoing objects, and other advantages and features of this invention are attained by a low voltage battery operated sock having a heater disposed in the toe portion thereof and having a battery pouch comprising of connected panel portions of sheet material formed to define a pocket for snugly containing a battery. Essentially the pouch is defined by a back, front, opposed sides, and bottom panels connected to define an opened top pocket. A flap is connected to the back panel which is adapted to fold over the open top of the pocket to form a closure therefor. The side portions of the pouch are each provided with laterally turned outer marginal portions

which are disposed in overlying relationship to the marginal portions of the back panel and secured thereto. The overlying marginal portions are secured so as to define a channelway through which a conductor is threaded

Electrical contacts are attached to the bottom of the pouch and to the flap. The arrangement is such that when the flap is closed a positive electrical contact is had between the contacts and the electrodes of the battery. A fastening means is provided for maintaining the flap closed; the arrangement being such that the flap functions as a switch to make and break the circuit to the heater.

The pouch is connected to the sock by the electrical conductors which connect the contacts of the pouch in circuit to the heater. This is attained by attaching the lower length of the conductors to the foot portion of the sock and having the remaining length extending through the sock to connect to the pouch contacts.

A supporting means is attached to the pouch in the form of a hook for detachably supporting the pouch to the boots or shoes of the wearer exterior of the wearer's pants where access thereto is rendered readily available at all times.

FEATURES

A feature of this invention resides in the provision wherein the battery pouch is operatively associated with the sock and heater therefore so as to provide a wholly self-contained electrically heated sock, yet enabling the battery pouch to be supported so that a wearer may have ready access to the switching means even when worn with ski type clothing.

Another feature resides in the provision wherein the battery pouch is separated from the sock proper by a length of conductors necessary to attach the battery pouch to the boot or shoe of the wearer.

Another feature resides in the provision of an electric sock having a battery pouch having a support hook for detachably supporting the pouch on the boot or shoe of the wearer.

Another feature resides in the provision of a battery pouch construction in which a channelway is formed along one side thereof through which a wire conductor may be threaded so as to prohibit any pull or snag thereon from tearing the conductor from its battery contact.

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

FIG. 1 illustrates a side elevation view of a low voltage, self contained, battery operated, electric sock embodying the present invention.

FIG. 2 illustrates a perspective view illustrating the operation of the electrically heated sock of FIG. 1 as worn with ski type clothing.

FIG. 3 illustrates the blank construction from which the battery pouch is constructed.

FIG. 4 is a front elevation view of the assembled battery pouch of this invention having portions thereof broken away.

FIG. 5 is a sectional side view taken along line 6—6 on FIG. 5.

FIG. 6 is a detail sectional view taken along line 6—6 on FIG. 4.

Referring to the drawings, there is shown in FIG. 1 an improved low voltage, battery operated, electrically heated sock 10 embodying the present invention. The sock per se 10A is a conventionally formed sock, as for example, a woven or knitted sock, that comprises essentially a foot portion 12 having a toe portion 12A, a heel portion 12B and connected leg portion 12C. At the upper end of the leg portion there may be provided a suitable elastic hem or cuff 13. A low voltage electrically energized heater means 14 is disposed, preferably, in the toe portion 12A of the sock 10. The heater means comprises a construction of a type disclosed in U.S. Pat. Nos. 3,293,405 and 3,396,264. More specifically the electrical heater means 14 in the illustrated embodiment comprises a flat electrical resistor element 15 having a U-shaped configu-

ration sandwiched between strips of thin heat diffusing material 16, 17 disposed in back to back relationship. The sandwiching material 16, 17 functions to maintain the shape of the electrical resistor element 15, as well as to provide means by which the electrical resistor element 15 is secured or maintained in position in the toe portion of the sock. Also the sandwiching material functions to diffuse the heat of the resistor 15 when energized and thereby eliminates hot spots. The sandwiching material 16, 17 may be any suitable material which will diffuse the heat sufficiently so as to avoid burning of the wearer. The sandwiching strips 16, 17, containing the electrical resistor element 15 is suitably secured to the sock as by sewing a marginal seam 18 along the opposed edges of the sandwiching strips 16, 17, as will be apparent to those skilled in the art. Sandwiching strips which have been found satisfactory comprise strips of foil, thin mylar plastic strips, cloth, acetate fabric tape, thin rubber tape and the like.

By forming the resistor element 15 as a U-shaped element as shown, it will be noted that the terminal ends of the resistor 15 are disposed to the same side. Positioning of the terminal ends of the resistor to one side thus enables the wire conductors 19, 20 to extend outwardly to the same side of the heater construction, thereby avoiding having a wire conductor passing under the foot or toes of the wearer.

As disclosed in the aforementioned U.S. patents, the resistor element 15 is sized so as to be readily energized by a low voltage battery, as for example, a battery of 6 volts or less, and preferably a dry cell flashlight battery of approximately 1½ volts.

Referring to FIGS. 1, 2, 5, and 6, the battery 21 is arranged so as to be suitably carried in an improved pouch 22, which is connected to the sock 10A and its heater means 14 by an extended length of conductor wires 19A, 20A. The pouch 22 is connected to the sock 10A so as to define a wholly self-contained, electrically heated sock; but which is yet rendered detachably connectible with a boot or shoe 23 of the wearer. The extended length 19A, 20A of the conductors by which the pouch 22 is connected to the sock heater must be sufficiently long so as to have the pouch 22 free to extend above the boot or shoe 23 of the wearer.

The pouch 22 to be herein described may be formed of an integral blank or sheet of suitable foldable material, or by the joining of two blank sections 24, 25 of the type shown in FIG. 4. As best seen in FIG. 4 the first sheet 24 comprises an elongated or rectangularly formed blank sized to define the back panel 26 of the pouch 22 and the connected closure flap 27.

The second sheet of piece 25 is sized and shaped to define a front panel portion 28, a connected bottom panel portion 29 and opposed side portions 30—30, folded relative to the front panel 28. The opposed side portions 30—30 are each provided with a laterally extending marginal flap 30A, 30A. In the folded and assembled position of the blanks, the marginal flaps 30A, 30A are folded laterally outwardly so as to be disposed in overlying relationship to the opposed marginal portions 26A, 26A of the back forming panel 26.

While the pouch may be formed of any suitable sheet material, it is preferred that the pouch be formed of readily heat fusible plastic sheet material. With the front and side panels 28 and 30—30 disposed in overlying relationship opposite the back panel as shown in FIGS. 1, 5, and 6, the side flanges 30A of the side panels 30 are disposed in overlying contiguous relationship to the opposed marginal portions 26A of the back panel 26. The respective contiguous portions 26A, 26A and 30A, 30A are suitably secured, e.g., by a heat fusible seam 31 extending longitudinally thereof. A heat fusible seam 32 may also be formed along the bottom edge of the back panel 26 to attach the rear edge of the bottom panel 29 to the back panel to define an open end pocket 33.

Formed on at least one of the pouch 22 is a channelway 33A which is adapted to receive a portion of wire conductor 19A as will be hereinafter described. As best seen in FIG. 6 the channelway 33A is defined by a second fused seam 31A which is spaced from seam 31.

Suitably connected to the bottom panel 29 of the pouch is an electrical contact 34. The electrical contact 34 may comprise a flat head rivet formed of electrical conductive material. The end of electrical conductor or wire 19A is provided with a suitable eyelet or terminal connector by which the wire 19A is electrically connected to the rivet contact 34.

A second contact 35 is connected to the closure flap 27 of the pouch. As best seen in FIGS. 5 and 6, the second contact 35 may also comprise a rivet of electrically conductive material.

Electrical conductor or wire 20A is suitably connected to contact 35, e.g., by an eyelet or terminal connector. The arrangement is such that when the closure flap 27 is closed, as seen in FIGS. 1 and 2, contact 35 is disposed in electrical contact with the electrode 36 of the battery 21.

A means is provided for securely fastening the closure flap 27 in the closed position so that the electrodes of the battery are positively engaged between the contacts 34 and 35. The flap fastening means 38 comprises a small strip or band of elastic or stretchable material which is suitably secured to the flap by a fastening means or rivet 39. Connected to the free end of the elastic band 38 is a snap fastener 40 which is adapted to mate with complementary snap fastener 41 connected to the front of the pouch. To effect energization of the resistor element 15, the wearer of the heated sock 10 need only to fasten the closure flap in the closed position by securing the complementary snap fasteners 40 and 41. To de-energize the heater 15, the wearer simply unlatches the closure flap 27. Thus the flap 27 functions as a switch to energize and de-energize the heater.

A support means 42 is provided for supporting the pouch 22 on the back portion of a boot or shoe 23. As best seen in FIG. 5, the supporting means 42 comprises a hook shaped element having a mounting portion 42A and a reversely bent tongue portion 42B. Referring to FIGS. 2 and 5 it will be noted that the reversely bent tongue portion 42B is inserted into the boot or shoe 23 so that the upper edge of the shoe is frictionally secured between the mounting portion 42A and the tongue portion 42B. It will be understood that the hook means or support means 42 may be formed of suitable resilient spring metal or plastic which will frictionally engage a portion of the shoe therebetween. To further enhance the frictional engagement of the boot, the tongue portion 42B may be provided with an integrally formed protruding or bead-like construction 43.

Referring to FIG. 5 it will be noted that the conductor 19A connecting the lower contact 34 to the resistor element 15 is threaded through the channelway 33A defined along the side of the pouch 22. Accordingly, the channelway 33A forms a protective guard or shield for the conductor which will prohibit snagging of the conductor against brush through which the wearer may pass. Consequently, it has been discovered that by threading the conductor 19A through the channelway 33A along the side of the pouch, a resistance is created which will resist any pull or snag from effecting separation between the conductor and its contact 34, which would render the heater ineffectual.

With the construction described it is to be noted that the battery and the battery pouch 22 supporting the same can be worn exteriorly of the wearer's outer garments, as for example, ski pants or a ski suit. Important also is that the pouch and battery is supported immediately adjacent to the sock and its heater so that a minimum length of conducting wire is required to connect the battery into circuit with the heater element. In this manner a minimal voltage drop is had in the circuit. By disposing or supporting the battery and pouch in the manner described the styling of the ski outfit worn by a wearer is not disturbed or adversely affected, while at the same time enabling the wearer to have complete access to the battery pouch and the switch flap 27 so as to effect control at all times of the energizing and/or de-energizing of the heater as may be required from time to time. In this manner the life of the battery can be greatly extended inasmuch as the heater is not required to be energized when the weather or climate con-

ditions do not so require. Also the instant construction eliminates the need of a strap or garter to support the battery to the wearer's leg, heretofore required.

While the invention has been described with respect to a particular embodiment thereof it will be readily appreciated and understood that variations and modifications may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. A battery operated, low voltage, electric boot sock comprising:

a foot portion having a toe portion and a heel portion, and a connected leg portion,
a low voltage electric heater means located in the foot portion of said sock,

means defining a pouch for holding a battery,
said pouch including a pair of electrical contacts adapted for engaging the electrodes of a battery positioned in said pouch,

electrical conductors electrically connecting said with the means with electrical contacts of said pouch,

means for securing a lower segmented portion of said conductors to the side of said sock, and the upper portion of said conductor being extended beyond said sock whereby said pouch is freely separated from said sock except by the length of said upper conductor portion,

and support means mounted on said pouch adapted for detachably securing said pouch to the edge of the edge of the wearer's boot when said sock is being worn, wherein said pouch defining means includes

a back portion,
a front portion having opposed side portions and a connected bottom portion,

means securing the ends of said side portions and bottom portion to the corresponding edges of said back portion, one of said contacts being disposed in the bottom of said pouch,

a conductor receiving means extending along one side of said pouch for receiving the conductor connecting said one contact whereby said conductor receiving means prohibits a force from affecting the electrical connection between the conductor and said one contact.

2. The invention as defined in claim 1 wherein said support means comprises

a hook connected to said pouch,
said hook having a tongue portion spaced from said pouch, said tongue portion being adapted to frictionally engage the boot of the wearer.

3. A battery operated, low voltage, electric boot sock comprising:

a foot portion having a toe portion and a heel portion, and a connected leg portion,

a low voltage electric heater means located in the foot portion of said sock,

means defining a pouch for holding a battery,
said pouch including a pair of electrical contacts adapted for engaging the electrodes of a battery positioned in said pouch,

electrical conductors electrically connecting said heater means with electrical contacts of said pouch,

means for securing a lower segmented portion of said conductors to the side of said sock, and the upper portion of said conductor being extended beyond said sock whereby said pouch is freely separated from said sock except by the length of said upper conductor portion,

and support means mounted on said pouch adapted for detachably securing said pouch to the edge of the wearer's boot when said sock is being worn, wherein said pouch defining means comprises

a back wall portion and a front wall portion,
said back wall portion having opposed marginal portions, a bottom defining web portion interconnecting said front and back wall portions,

said front wall portion having connected side wall forming portions which in the folded position define the side walls of the pouch construction,

each of said side walls having outer marginal portions disposed in contiguous overlying relationship to the outer marginal portions of said back wall portion,

means for securing said marginal portions of the respective back and side wall portions,

one of said secured marginal portions having a channelway formed therein for receiving a conductor,
a flap portion defining a closure for said pouch,
and means for detachably securing said flap in the operative position of said pouch.

4. The invention as defined in claim 3 wherein one of said contacts is connected to said flap portion to engage an electrode of a battery in the closed position, and the other of said contacts is connected to said bottom web portion of the pouch.

5. The invention as defined in claim 4 wherein the conductor connected to said bottom attached contact is extended through the channelway defined in the marginal portion of said pouch.

6. The invention as defined in claim 5 wherein said support means includes

a hook having a mounting portion and a reversely bent tongue portion,

said tongue portion being spaced from said mounting portion,

fastening means for securing said mounting portion to said back portion of said pouch.

7. The invention as defined in claim 6 wherein said tongue portion includes a protruding bead-like indentation adapted to frictionally engage a boot portion between the tongue portion and mounting portion.

8. The invention as defined in claim 3 where said pouch defining means comprises

a first blank of sheet material defining the back portion and connected flap of said pouch, and

a second blank of sheet material to define the front, connected opposed side portions and connected bottom portion.

9. A battery pouch construction for positioning and holding a low voltage battery relative to a battery actuated garment comprising a back forming panel, a front forming panel, and a bottom panel interconnecting said front and back panels,

opposed side forming panels interconnected between said front and back forming panels,

each of said side forming panels having laterally outwardly extending marginal portions adapted to be disposed in contiguous overlying relationship to the marginal portions of said back forming panel,

means for securing said overlying marginal portions to define an opened end battery receiving pocket,

means defining a channelway formed in at least one of said secured marginal portions,

a flap connected to the upper end of the back panel, said flap being adapted to be folded over the top of said pocket to define a closure therefor,

a fastener means for securing said flap to the front panel in the operative closed position,

an electrical contact secured to said flap to engage in electrical contact with an electrode of a battery adapted to be carried in said pouch,

a second electrical contact connected to the bottom panel to electrically contact with the other electrode of a battery,

an electrical conductor connected to said second contact, said conductor being threaded through the channelway defined in said marginal portion,

and means connected to said pouch adapted for detachably securing said pouch to the boot of a wearer.

10. The invention as defined in claim 9 wherein said detachable securing means includes means defining a hook connected to said back panel,

said hook having a reversely turned tongue end portion adapted to frictionally engage the upper end of a wearer's boot.

11. The invention as defined in claim 9 wherein said panels are formed of heat fusible material, and said means for securing said overlying marginal portions includes a pair of spaced apart longitudinally extending heat fusible seams.

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