

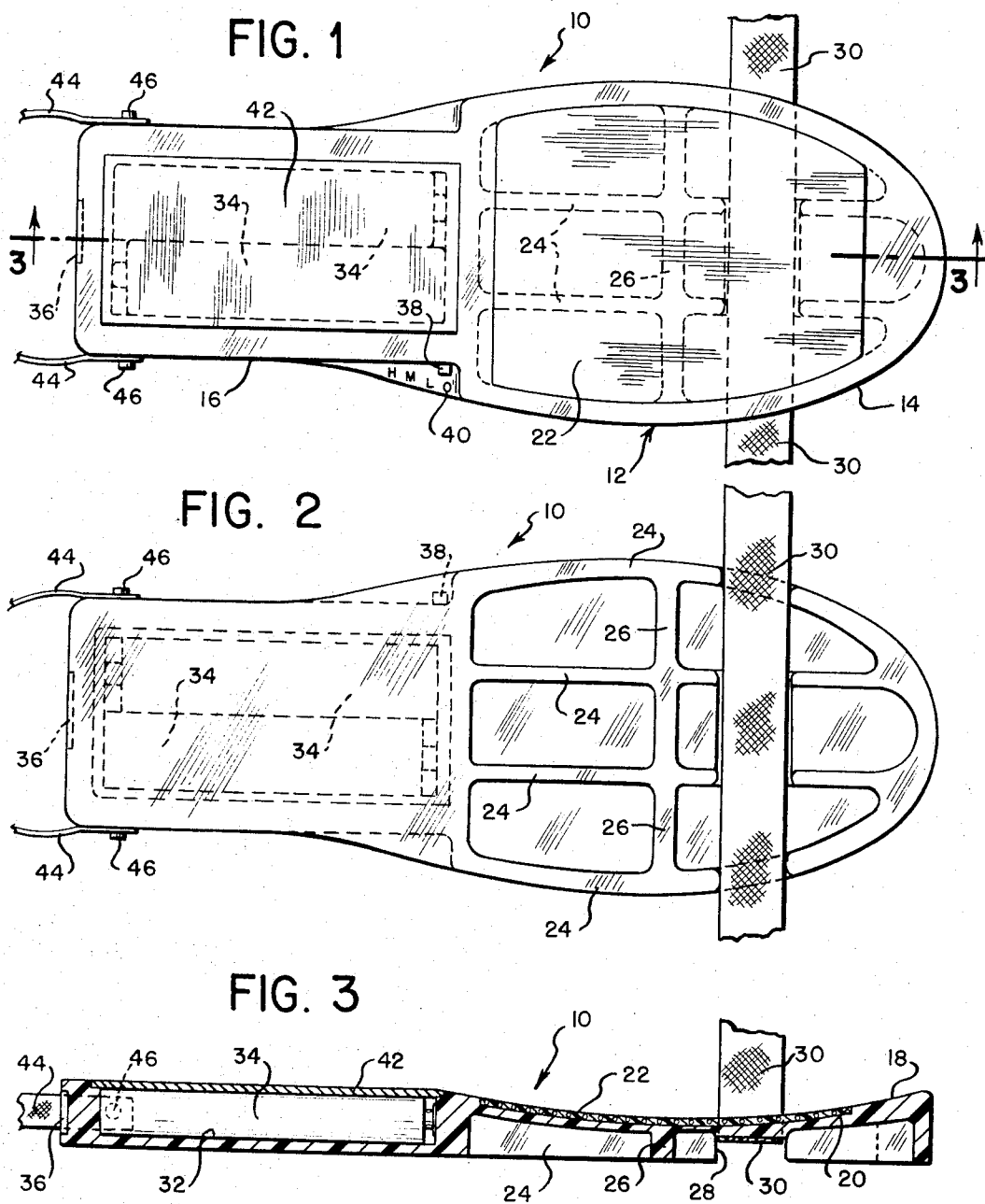
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PORTABLE ELECTRICAL FOOT HEATING APPARATUS

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ABSTRACT OF THE DISCLOSURE

Personal, and more particularly, portable heating apparatus that may be utilized with pedis portions of the human torso, which apparatus is constructed and arranged to provide a selectively controlled quantity of available thermal energy for substantially sustained periods of time, even under such ambient conditions as freezing temperatures.

The present invention pertains, generally, to personal heating apparatus or devices, and, more particularly, to portable heating apparatus that may be utilized with the pedis portions of the human torso, said apparatus being so constructed and arranged as to provide a selectively controllable quantity of available thermal energy during substantially sustained periods of time, and even under such ambient conditions as freezing temperatures.

The spectator at a sporting event that is usually conducted outdoors, such as a football game, skiing contest, and the like, held during the fall and winter months of the year, and often under such ambient conditions as freezing temperatures, will tend to utilize much additional wearing apparel than would ordinarily not be worn. Obviously, the use of such additional wearing apparel, which oftentimes is as bulky as it is warm, is a matter of self-defense to the elements, enabling the wearer, if effective for its intended purpose, to remain for the duration of the sporting event, often extending over a period of more than one day.

An item of wearing apparel that is frequently used when winter weather conditions prevail is a boot or shoe that oftentimes is fur-lined in an attempt to provide some degree of protection, and possibly warmth, from the surrounding ambient conditions. This item can be of extreme bulk, rendering it uncomfortable to wear over extended periods of time, and since it is merely designed to preclude exposure to the cold, can hardly be capable of effectuating little more than precluding a too rapid dissipation of natural bodily warmth.

Accordingly, it has heretofore been suggested that a boot, shoe, or the like, be so constructed and arranged as to comprise an heating element capable of developing thermal energy that can be transmitted to the pedis portions of the human torso, enabling these portions to be disposed in an environment of warmth. Thus, not only will exposure to the cold ambient be precluded, but there will be positively developed a warm environment that will not only tend to eliminate rapid dissipation of inherent bodily warmth, and, in view of the fact that a positively developed warm ambient is, in effect, substituted for the prevailing cold ambient, will enable the wearer to remain in the latter type of atmosphere for significantly greater periods of time.

However, such devices as have heretofore been suggested are prone to certain prevalent disadvantages. Thus, it has been found that prior devices or apparatus of this type are unreliable and even dangerous since the heating elements are so constructed and arranged as to cause an impairment of the insulating parts, resulting even in the destruction thereof. In addition, it has been found that prior devices of this type fail to provide the proper and requisite degree of flexibility, elasticity, and the like,

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enabling the device to, of necessity, accommodate natural movements of the pedis portions of the torso. As a result, such natural movements as will occur tend to change the predetermined position of the various component parts thereof, with the result that a short circuit might well occur causing a burning of the parts, and even injury to the wearer.

Still further, it has been found that such devices of this type as have heretofore been suggested have a tendency to absorb perspiration enabling the insulating portions of the device to become conductive. Accordingly, the portions of the torso encompassed thereby will be subjected to the electric current applied to the heating element.

Accordingly, having in mind each and every one of the foregoing disadvantages, and others that will be readily apparent to those skilled in the art, it is a primary object of the present invention to provide personal heating apparatus or devices that may be utilized with the pedis portions of the human torso, said apparatus being so constructed and arranged as to provide a selectively controllable quantity of available thermal energy during substantially sustained periods of time, and even under such ambient conditions as freezing temperatures, enabling these portions to be disposed in a warm and comfortable environment, rather than being exposed to a cold ambient, further enabling the wearer to remain in a cold atmosphere of even freezing temperatures for significantly greater periods of time.

Another primary object of this invention is to provide portable personal heating apparatus or devices that may be utilized with the pedis portions of the human torso, said apparatus being so constructed and arranged as to provide a selectively controllable quantity of available thermal energy during substantially sustained periods of time, and even under such ambient conditions as freezing temperatures, while yet being stable and reliable in use, thus substantially, if not completely, eliminating the possibility of destruction of certain of the component parts, enabling the pedis portions of the torso to be disposed in a warm environment, rather than being exposed to a cold atmosphere of even freezing temperatures, further enabling the wearer to remain in the latter type of atmosphere for significantly greater periods of time.

Yet another primary object of the present invention is to provide portable personal heating apparatus or devices that may be utilized with the pedis portions of the human torso, said apparatus being so constructed and arranged as to provide a selectively controllable quantity of available thermal energy during substantially sustained periods of time, and even under such ambient conditions as freezing temperatures, while yet being so constructed and arranged as to present the proper and requisite degree of flexibility, elasticity, and the like, enabling the apparatus or device to accommodate natural bodily movements of the pedis portions without effecting the position of the component parts thereof, and causing short circuits, burning of such parts, and injury to the wearer, enabling said pedis portions to be disposed in a warm environment, rather than being exposed to a cold atmosphere of even freezing temperatures, further enabling the wearer to remain in the latter type of atmosphere for significantly greater periods of time.

A further primary object of this invention is to provide portable personal heating apparatus or devices that may be utilized with the pedis portions of the human torso, said apparatus being so constructed and arranged as to provide a selectively controllable quantity of available thermal energy during substantially sustained periods of time, and even under such ambient conditions as freezing temperatures, while yet being so constructed and arranged as to preclude the absorption of perspiration to an extent that permits certain component parts to become conduc-

tive, thus subjecting the torso to an electric current, enabling said pedis portions to be disposed in a warm environment, rather than being exposed to a cold atmosphere of even freezing temperatures, further enabling a wearer to remain in the latter type of atmosphere for significantly greater periods of time.

A still further primary object of the present invention is to provide portable personal heating apparatus that may be utilized with the pedis portions of the human torso, said apparatus being so constructed and arranged as to provide a selectively controllable quantity of available thermal energy during substantially sustained periods of time, and even under such ambient conditions as freezing temperatures, while yet, in addition to each and every one of the foregoing, being capable of economic fabrication, sturdiness of construction, reliability in use, and even esthetic appearance, enabling said pedis portions to be disposed in a warm environment, rather than being exposed to a cold atmosphere of even freezing temperatures, further enabling a wearer to remain in the latter type of atmosphere for significantly greater periods of time.

The invention resides in the combination, construction, arrangement, and disposition of the various component parts and means incorporated in an improved personal heating apparatus constructed in accordance herewith. This invention will be better understood and objects and important features other than those specifically enumerated above will become apparent when consideration is given to the following detailed description which, when taken in conjunction with the annexed drawing, describes, discloses, shows and illustrates a preferred embodiment of the present invention, and what is presently considered to be the best mode of practicing the principles thereof. Other embodiments or modifications may be suggested to those having the benefit of the teachings herein, and such other embodiments or modifications are intended to be reserved especially as they fall within the scope and spirit of the subjoined claims.

In the drawing:

FIG. 1 is a top plan view of a personal heating apparatus constructed in accordance with the principles of the present invention;

FIG. 2 is a bottom plan view of the apparatus illustrated in FIG. 1; and

FIG. 3 is a cross-sectional view taken along the line 3—3 of FIG. 1.

With particular reference now to the drawing, there is illustrated therein personal heating apparatus constructed in accordance with the principles of the present invention, and generally designated by the reference character 10.

The apparatus 10, which can also be referred to as a shoe portion, boot portion, slipper portion, or even in general terms as a "foot warmer," comprises a platform 12 that may be fabricated of any suitable material, and preferably is fabricated of a plastic substance. The particular plastic material chosen desirably should present the characteristic of sufficient rigidity, while yet presenting the additional desirable and requisite characteristics of flexibility or pliability, enabling ordinary bodily movements of the wearer to be accommodated.

The platform 12 comprises a sole portion 14, and a heel portion 16. The sole portion 14 is generally of oval configuration, and comprises an upper surface 18 that is generally of concave configuration. The upper surface 18 in turn, comprises a recess 20 in which a heating film 22, hereinafter to be described more fully, is particularly adapted to be disposed. The sole portion 14 comprises, still further, a plurality of longitudinally extending ribs 24, and a transversely extending brace 26. The ribs 24 and brace 26 perform the function of adding stability to the sole portion 14 and, in addition, tend to minimize heat loss since they increase the effective area of the sole portion 14, which is the location at which the heating film 22 is particularly adapted to be disposed, as hereinbefore pointed out. The ribs 24 are cut-away to define a groove 28 extend-

ing transversely of the sole portion 14, within which a strap 30 is particularly adapted to be disposed. The strap may be fabricated of any suitable material, and preferably is fabricated on an elastic material, enabling the foot warmer 10 to accommodate pedis portions of varying girths.

As hereinbefore pointed out, the heating film 22 is particularly adapted to be disposed or positioned within the recess 20. The heating film desirably is occupied by an electrically conductive surface pattern over a major portion of the area thereof. Furthermore, the heating film 22 is so constructed and arranged that the voltage drop produced by a relatively heavy current is of such value that the wattage loss in the film is that no location capable of raising its thermal value to such an extent as to result in damage to the film or the sole portion 14 of the foot warmer. It will be understood that the heating film preferably is fabricated of a very thin material, so that it is of small mass. Accordingly, not only is the heating film flexible, but is of a very low heat inertia.

It will also be understood that the term "relatively heavy current" is intended to encompass within the scope thereof a current in the range of amperes, as distinct from milliamperes or kilo-amperes. To insure that the voltage drop produced by such a relatively heavy current will not result in damage, the heating film further is so constructed and arranged as to present a small total resistance of the electrically conductive surface pattern, the term "small total resistance" being intended to encompass within the scope thereof a resistance in the range of ohms, as distinct from milli-ohms or kilo-ohms. Desirably, the voltage drop contact, that is, the drop is usually below 50 volts.

It is considered readily apparent that the pedis portions of a wearer is particularly adapted to be positioned upon the foot warmer 10, either in the presence or absence of an outer covering, such as a shoe. Accordingly, the area presented by the heating film 22 desirably is chosen to substantially correspond with the area of the surface to be treated, namely, the aforesaid pedis portions. A major portion of the heating film is occupied by the electrically conductive surface pattern, as hereinbefore pointed out, which also is substantially uniformly distributed thereover, enabling maximum use of the available area to be made, while local concentrations of heat, such as in the nature of "hot spots," is avoided.

The heating film 22 may be fabricated in any suitable manner, and of any suitable material. It preferably presents a thin flexible pattern, that, for example, can be fabricated of a metallic foil. The use of any suitable technique for fabricating the film can be invoked, and, for example, such methods for fabricating printed circuits as are presently known may be used.

The heel portion 16 of the foot warmer 10 is of generally rectangular configuration, and comprises a recess 32 of similar shape defining a chamber in which a suitable source of power is particularly adapted to be disposed. Such a power source may, for example, comprise a plurality of rechargeable batteries 34 which may be of any suitable type and construction capable of functioning in a manner and supplying a quantity of energy sufficient to enable a foot warmer constructed in accordance with the principles of the present invention, comprising a heating film, such as the film 22, capable of satisfying each and every one of the foregoing desirable and requisite characteristics. For example, the batteries 34 may be of the replaceable, long-lasting, dry-cell type, such as the nickel-cadmium category of battery that is presently commercially available. Alternatively, the batteries 34 may be of the rechargeable type, in which case they can be removably mounted in the recess 32 of the heel portion 16 of the warmer. In the latter instance, the batteries 34 could be permanently mounted in the recess to enable recharging while remaining in position therein, and to this end, the heel portion 16 is provided with a suitable recharging re-

cess 36 which, though not shown, comprises suitable contacts enabling the batteries 34 to be operatively associated with a charging unit or apparatus (not shown). Conceivably, the charging unit (not shown) may be mounted or positioned within the heel portion 16, enabling the entire foot warmer to simply be plugged into a conventional electric outlet for recharging purposes. Such an integral charging unit may be of the type comprising a rectifier and a transformer, enabling the foot warmer to alternatively be operable by house current, if desired, during the time of recharging the batteries 34. In the latter instance, the rectifier and transformer could both be mounted within the charging unit (not shown), or the transformer could be carried by a connective plug (not shown) to reduce the weight of the charging unit.

The heel portion 16 comprises, further, an on-off switch 38 for controlling the supply of electric energy to the heating film 22. The switch 38 may be of any suitable construction, and, for example, might comprise a four position switch having an off position 40, and a plurality of on positions, each of which provides a different degree of heat as the final result of the foot warmer 10. These positions are indicated by the reference characters L, M, and H, each such position being intended to indicate low heat, medium heat and a high degree of heat, respectively. It is considered readily apparent that the power supply comprising the batteries 34, the on-off switch 38, and the heating film 24 will each of them be electrically operatively associated with one another in an electrical circuit in which they are disposed in a series relationship. Though not shown, this can be accomplished in any suitable and conventional manner, it being understood that the material from which the heel and sole portions 16 and 14, respectively, of the platform 12 preferably are fabricated of a material that is especially capable of functioning as an excellent insulating material.

The recess 32 is particularly adapted to be enclosed by a cover or cover portion 42. The cover may be fabricated of any suitable material, and preferably is fabricated of metal to protect the source of energy comprising the batteries 34. A strap 44 is positioned upon the heel portion 16 and is particularly adapted to extend rearwardly of the foot warmer, to assist the strap 30 in maintaining the warmer upon the pedis portions of a wearer. The strap 44 will desirably extend about the ankle portion of the wearer, and, like the strap 30, preferably is fabricated of an elastic material to accommodate different sizes, and ordinary bodily movements. This strap preferably is pivotally movable with respect to the sole portion 16, and may be mounted or positioned thereupon through the medium of any suitable fastener 46 with a view towards accomplishing this function or purpose.

The use and operation of a foot warmer constructed in accordance with the principles of the present invention, such as the foot warmer 10, is considered readily apparent in view of the foregoing description thereof. It will be understood that the warmer can be positioned directly upon the pedis portions of a wearer, or may be used in conjunction with such an outer garment as a shoe, slipper, and the like. The construction and arrangement of an apparatus or device constructed in accordance herewith will enable a wearer to attend athletic events conducted under ambient conditions over an extended period of time, substantially notwithstanding such ambient conditions as freezing temperatures. If the source of energy comprising the batteries 34 are defined by long-lasting replaceable batteries, then, even if replacement during the event is necessary, this can be accomplished with facility by simply removing the cover 42, enabling the supply of heat to rapidly and quickly once again be available. And, if the source of energy comprising the batteries 34 is of the rechargeable type, then, upon dissipation of the supply of energy available therefrom, recharging can be effected simply and with facility by operatively associating a suitable recharging unit (not

shown) with the foot warmer 10 at the charging recess 36. As hereinbefore pointed out, the foot warmer 10 can be used when the source of energy is being recharged, by simply making use of a unit that is capable of performing that function. At this point, it will be understood that an apparatus or device constructed in accordance with the principles of this invention, such as the foot warmer 10, can be fabricated simply and economically in any suitable manner, and for example can be fabricated by a suitable molding process. In this instance, the sole portion 14 and the heel portion 16 will be integral components of the warmer, and the ribs 24 and the brace 26 will be integral components of the sole portion. However, if desired, these components can be individually fabricated and operatively associated with one another in any suitable manner.

After reading the foregoing detailed description of an exemplary and illustrated form of the present invention, it will be understood that the objects set forth at the outset of this specification has successfully been achieved. And, while the invention has been shown, illustrated, described and disclosed in terms of an illustrated embodiment or modification which it has assumed in practice, the scope of the invention should not be deemed to be limited thereby, such other embodiments or modifications intended to be reserved especially as they fall within the scope of the claims here appended.

What is claimed is:

1. Apparatus for providing a controlled quantity of available thermal energy for application to the pedis portions of the wearer, comprising, in combination:
 - a sole portion and a heel portion;
 - said sole and heel portions being fabricated of an electrically non-conductive material comprising:
 - a surface having a recess therein;
 - a heating film of electrically resistive material positioned within said recess for presenting a controlled quantity of available thermal energy that can uniformly and comfortably be applied to the pedis portions of a wearer;
 - said heel portion comprising:
 - an energy chamber;
 - a source of electrical energy positioned within said energy chamber; and
 - electrical conductors connecting the heating film to the source of energy.
2. Apparatus for providing a controlled quantity of available thermal energy as defined in claim 1, wherein:
 - said heel portion further comprises:
 - a switch enabling a supply of energy from the source thereof to be translated to said heating film;
 - said switch having a plurality of operative positions for varying the quantity of energy supplied to said heating film.
3. Apparatus for providing a controlled quantity of available thermal energy as defined in claim 1, wherein:
 - said sole portion further comprises:
 - a plurality of generally longitudinally extending ribs;
 - at least one transversely extending brace; and
 - said rib and said brace extending from a bottom surface of said sole portion enabling the presentation of strength and stability at least to said sole portion, and further enabling an increase in the surface area of said sole portion to substantially minimize heat loss.
4. Apparatus for providing a controlled quantity of available thermal energy as defined in claim 2, wherein:
 - said source of energy comprises:
 - a plurality of long-lasting batteries positioned within said energy chamber; and wherein:
 - a cover portion is removably positioned on said heel portion for enclosing said energy chamber.
5. Apparatus for providing a controlled quantity of

available thermal energy as defined in claim 2, wherein:
 said source of energy comprises:
 a plurality of rechargeable batteries removably positioned within said energy chamber; and wherein:
 said heel portion further comprises:
 a charging receptable enabling said source of energy to be recharged when the energy thereof has been dissipated.

6. Apparatus for providing a controlled quantity of available thermal energy as defined in claim 3, wherein:
 said sole and heel portions are integral components of a platform; and,
 said ribs and said brace are integral components of said sole portion; and wherein:
 said platform and the integral components thereof are fabricated of a plastic material.

7. Apparatus for providing a controlled quantity of available thermal energy as defined in claim 6, wherein:
 said sole and heel portions each of them further comprise:

an elastic strap enabling said platform to be removably positioned upon the pedis portions of the wearer; said ribs being cut-away to define a groove extending transversely across said sole portion; and

the elastic strap of said sole portion being disposed within and extending across said groove.

References Cited

UNITED STATES PATENTS

741,623	10/1903	Busky	128—382
1,566,987	12/1925	Simmons	219—211
1,933,243	10/1933	De Merolis et al.	128—382 X
2,025,950	12/1935	Kurtz	219—211 X
2,028,347	1/1936	Pelosi	219—211 X
2,277,772	3/1942	Marick	219—527 X
2,526,940	10/1950	Fello	36—11.5
2,619,580	11/1952	Pontiere	219—528
2,680,918	6/1954	Behner	36—2.6
2,692,326	10/1954	Crowell	219—211
2,760,279	8/1956	Jones et al.	36—11.5
3,079,486	2/1963	Winchell	219—528

FOREIGN PATENTS

146,353	11/1903	Germany.
626,073	5/1927	France.

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