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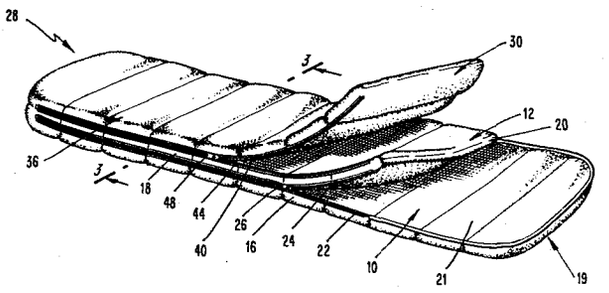
(54) Mantle system for sleeping bag.

(57) A system for selectively adapting the thermal operating range of a sleeping bag to a variety of exterior temperature conditions including a plurality of discrete mantles of varying insulative capacity substantially congruent with the top surface of the sleeping bag. A mantle having a suitable insulative capacity is superimposed on the upper surface of the sleeping bag and removeably attached thereto by cooperating zippers on the outside edges of the mantle and sleeping bag.



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Mantle System for Sleeping Bag

Background of the Invention

Field of the Invention

This invention relates to sleeping bags and more particularly to sleeping bags having a variable insulative capacity.

Background Art

It is desirable to a sleeping bag to be adaptable for use in a broad range of temperature environments without the need to resort to an entirely different sleeping bag with which to do so. The sleeping bag ideally suitable to one seasonal, climatic, or geographic circumstance is frequently over-insulated, and thus too warm, or under-insulated, and thus too cool, for a different set of conditions. Thus, those who use sleeping bags in significantly varying circumstances can be confronted with fatigue resulting from uncomfortable sleep, and in extreme circumstances with illness or loss of life or limb, if the same sleeping bag is employed unmodified in different environments.

Recourse has frequently been made simply to the use of two or more separate sleeping bags to resolve this dilemma. In this regard, a given user can employ sleeping bags of differing weights, as with a summer and a winter weight sleeping bag, or a low and a high altitude sleeping bag, using each in the alternative as circumstances may demand. On the other hand, two or more light or medium weight sleeping bags may simply be utilized one within the other as decreasing external temperatures force the user to add insulation in order to maintain warmth.

Aside from the additional expense of owning or obtaining access to a plurality of sleeping bags, these means of adapting to a variety of thermal conditions have other drawbacks. Plural sleeping bags require additional storage space when not in use. The placement of one sleeping bag within another can often reduce the space within the inner bag, constricting the occupant and, ironically, reducing the insulative capacity of the combination through compression of the insulating material in each separate sleeping bag.

Furthermore, use of a plurality of sleeping bags to contend with a variety of thermal conditions ultimately can be faulted as overlooking the fundamental fact that in sleeping gear it is the insulative material above, rather than under an occupant, which is most effective toward conserving body heat. Two natural principles contribute to this result. First, the weight of a sleeping bag occupant tends to compress the insulation beneath that occupant, reducing the volume of dead air space within and permitting the rapid escape of heat. Secondly, because warm air rises, the body heat of a sleeping bag user is continuously being drawn away upward, regardless of the temperatures of air or ground exterior to the sleeping bag. Heat migration away from the body of an occupant of a sleeping bag, even within the insulation of the sleeping bag itself, will therefore be fastest directly above the occupant.

Attempts to cope with diverse thermal sleeping conditions by using a plurality of sleeping bags add or remove substantially the same amount of additional insulation both above and below the user. While altering the amount of insulation above the occupant does affect the thermal range of the sleeping gear, varying the amount of insulation below will not have nearly as significant an effect. Thus, particularly in adapting lightweight slee-

ping bags to use in colder weather, insulation added beneath the user is less effectively employed than if the same amount of insulation were added above. The additional underlying insulation is to a degree wasted, representing therefore an unnecessary expense for equipment. Also, were the sleeping gear must be carried, as in backpacking, to its point of ultimate use, this additional insulation is an unnecessary portage burden.

Sleeping bags are known in which the problem of varying external temperature conditions is met by constructing a sleeping bag comprising a number of parallel horizontal insulative layers all secured along one logitudinal edge like the pages of a book. The user of such a sleeping bag sleeps between those of the layers as produces comfortable results, given the temperature outside. In warmer weather the user rests among the layers so that most of them are below, while in colder weather most should be above. Many of these types of sleeping bags, however, are little more than one sleeping bag within another, the user being able to sleep not just within the inner bag, but also upon both of the layers of the inner bag in warm weather and under both of them in cold weather.

Nevertheless, even such advanced sleeping bag designs suffer in that the many layers employed, being permanently secured to each other, must be all purchased and portaged together, regardless of how many will ultimately be used effectively as insulating layers above the occupant. Extra layers disposed below the occupant signify that a sleeping bag capable of withstanding colder temperatures is being underutilized, which in turn implies inefficient expenditure for equipment and exessive portage weight.

Before this invention a user of sleeping gear who desired to be comfortable in a broad range of temperatures

had only the options of doing so with a plurality of sleeping bags or with the layered configuration described above. However, as both these alternatives manifest marked inefficiences, it can be said that prior to this invention the problem of adapting a sleeping bag to diverse temperature environments had not been effectively resolved.

Summary of the Invention

One object of the present invention is a sleeping bag which can be adapted to a wide range of temperature conditions.

Another object of the present invention is a sleeping bag of variable insulative capacity which maximizes the effective use of insulative material in doing so.

Yet another object of the present invention is a sleeping bag for use in a wide range of temperatures which efficiently employs insulative material and yet minimizes the portage weight of the sleeping bag, particularly in milder temperature conditions.

A final object of the present invention is a sleeping bag which, though originally acquired for mild weather use, can easily be adapted to more severe temperatures.

Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by the practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instruments and combinations particularly pointed out in the appended claims.

To achieve the foregoing objects, and in accordance with the invention as embodied and broadly described herein, a system for selectively increasing the thermal operating range of a sleeping bag comprises a plurality of discrete mantles of varying insulative capacity; and means for removably securing a selected one of the mantles superimposed on the upper surface of the sleeping bag.

In another preferred embodiment of the present invention, a sleeping bag having top and bottom insulating layers between which a user is to rest, is provided with the improvement comprising a separate insulative mantle substantially congruent to the top insulating layer; and means for removably securing the mantle superimposed on the outer surface of the top insulating layer for selectively enhancing the thermal operating range of the sleeping bag.

The means for removably securing the mantle comprises first attachment means on outside edges of the sleeping bag; and second attachment means on the mantle cooperating with the first attachment means. Preferably the first attachment means comprises at least one first zipper track and the second attachment means comprises at least one second zipper track.

Brief Description of the Drawings

The invention will be described with additional specificity and detail through the use of the accompanying diagrams in which:

Fig. 1 is a perspective view of a sleeping bag incorporating the teachings of the present invention viewed from one longitudinal edge

thereof;

Fig. 2 is a perspective view of the sleeping bag of Fig. 1 viewed from the opposite longitudinal edge; and

Fig. 3 is a sectional elevation view taken along the section line 3-3 of Fig. 1.

Description of the preferred Embodiment

Referring to Fig 1 and 2 together, a conventional sleeping bag is shown to comprise a bottom insulating layer 10 and a top insulating layer 12 joined together at a shared longitudinal edge 14. In the use of the sleeping bag bottom insulating layer 10 and top insulating layer 12 are folded along longitudinal edge 14 so that a user is sandwiched between insulating layers 10, 12, while free longitudinal edge 16 of bottom insulating layer 10 and free longitudinal edge 18 of top insulating layer 12 meet opposite the occupant from shared longitudinal edge 14, as already known.

At the upper or head end 19 of the sleeping bag, bottom insulating layer 10 frequently extends beyond the top edge 20 of top insulating layer 12 to form a head rest or hood 21. Means are usually provided for securing together free longitudinal edges 16, 18. As shown in Figs. 1 and 3, attached to free longitudinal edge 16 of bottom insulating layer 10 is a zipper track 22, while attached to free longitudinal edge 18 of top insulating layer 12 is a zipper track 24. Through the action of a zipper slide 26, zipper tracks 22, 24 cooperate to close the gap between longitudinal edges 16, 18. At the foot 28 of the sleeping bag insulating layers 10, 12 are either permanently secured together or separably engaged through

the provision on insulating layers 10, 12 of extensions of cooperating zipper tracks 22, 24.

According to the quality and quantity of insulating contained within layers, such as layers 10, 12, a sleeping bag as has been described thus far will have a generally fixed minimum operational temperature below which the body heat of an occupant cannot be effectively conserved. According to one aspect of the present invention a system is provided for selectively increasing the thermal operating range of such a sleeping bag. As seen in Figs. 1 - 3, an additional insulating layer or mantle 30 which is substantially congruent to top insulating layer 12 is placed resting upon top insulating layer 12 to add insulation above the user. Mantle 30 is representative of any one of a plurality of discrete mantles of varying insulative capacity and wind or moisture resistant construction, the appropriate mantle from the plurality of discrete mantles being selected for use according to the degree of added insulation and temperature protection desired under a given set of circumstances. The top surface 32 of mantle 30 may advantageously be composed of a number of different materials, some water resistant, such as a laminate of expanded polytetrafluoroethylene. To the extent that top surface 32 of mantle 30 serves to decrease convection, thermal insulation is increased by retarding the upward flow of heat away from the body of the occupant.

According to another aspect of the present invention means are provided for removably securing mantle 30 superimposed on the upper surface of top insulating layer 12. Along the outside longitudinal edges 34, 36 of mantle 30 there are provided first attachment means which cooperate with second attachment means located respectively at longitudinal edges 14, 18 of top insulating layer 12. By way of example and not limitation there

are shown in Figs. 1 - 3 zipper tracks 38, 40 attached respectively to longitudinal edges 34, 36 of mantle 30. Upon longitudinal edges 14, 18 of top insulating layer 12 are secured respectively zipper tracks 42, 44. Through the action respectively of zipper slides 46, 48 zipper track 38 engages track 42 and zipper track 40 engages track 44 to securely attach mantle 30 to the top surface of top insulating layer 12. In this manner, mantle 30 is prevented from sliding off the top of the sleeping bag to which it is attached due to motions of the user or the action of wind. By providing similar cooperating zipper tracks at the foot 28 of the sleeping bag, mantle 30 may be secured along its entire exterior perimeter; however, it has been found sufficient to so attach mantle 30 only along longitudinal edges 34, 36.

The provision of a mantle of additional insulating material solely above the occupant of a sleeping bag places that additional insulative material to its most effective possible use. Additional insulation beneath the body of a user of a sleeping bag will be thoroughly compressed by the weight of the user and, therefore, rendered ineffective to enhance the thermal capacity of the sleeping bag. It bears emphasis that mantle 30 is nowhere permanently attached to top insulating layer 12, but may be removed completely if desired. Therefore, when enhanced thermal protection is not needed, as in use in mild weather, mantle 30 may be removed entirely from the sleeping bag assembly and stored separately. When enhanced insulated capacity is not required, the user of a sleeping bag embodying the principle of the present invention need not contend with the excess bulk or weight of any extra insulation required to adapt his sleeping gear to colder weather conditions.

It can be seen that by the system of mantles for sleeping bags described above, a single sleeping bag can be

rendered capable of serving its user comfortably in a wide range of temperature conditions. Further, it will be noted that the additional insulative material contained in a mantle used by the method of the present invention to enhance the insulative capacity of a sleeping bag is placed entirely above the user to maximize its effectiveness, and yet is completely separable from the sleeping bag so as to minimize portage weight associated with sleeping gear when milder temperatures are expected.

It will be apparent to those skilled in the art that modification and variations can be made in the apparatus of this invention. The invention in its broader aspects is, therefore, not limited to the specific details, representative methods and apparatus, and illustrative examples shown and described. Accordingly, alterations may be made from such details without departing from the spirit or the scope of applicants general inventive concept.

What is claimed is:

1. A system for selectively increasing the thermal operating range of a sleeping bag, comprising:

a. a plurality of discrete mantles of varying insulative capacity; and

b. means for removeably securing a selected one of said mantles superimposed on the upper surface of said sleeping bag.

2. In a sleeping bag having top and bottom insulating layers between which a user is to rest, the improvement comprising:

a. a separate insulative mantle substantially congruent to said top insulating layer; and

b. means for removably securing said mantle superimposed on the outer surface of said top insulating layer for selectively enhancing the thermal operating range of said sleeping bag.

3. An improved sleeping bag as recited in Claim 2, wherein said means for removeably securing said mantle comprises:

a. first attachment means on outside edges of said sleeping bag; and

b. second attachment means on said mantle cooperating with said first attachment means.

4. An improved sleeping bag as recited in Claim 3, wherein:

a. said first attachment means comprises at least one first zipper track; and

b. said second attachment means comprises at least one second zipper track.

5. An improved sleeping bag as recited in Claim 3, wherein:

a. said first attachment means comprises a first pair of zipper tracks at each longitudinal periphery of said sleeping bag; and

b. said second attachment means comprises a second pair of zipper tracks at each longitudinal periphery of said mantle.

6. An improved sleeping bag as recited in Claim 2, wherein said upper surface of said mantle comprises a water-repellent laminate sheet.

7. An improved sleeping bag as recited in Claim 6, wherein said water-repellent laminate contains expanded polytetrafluoroethylene.

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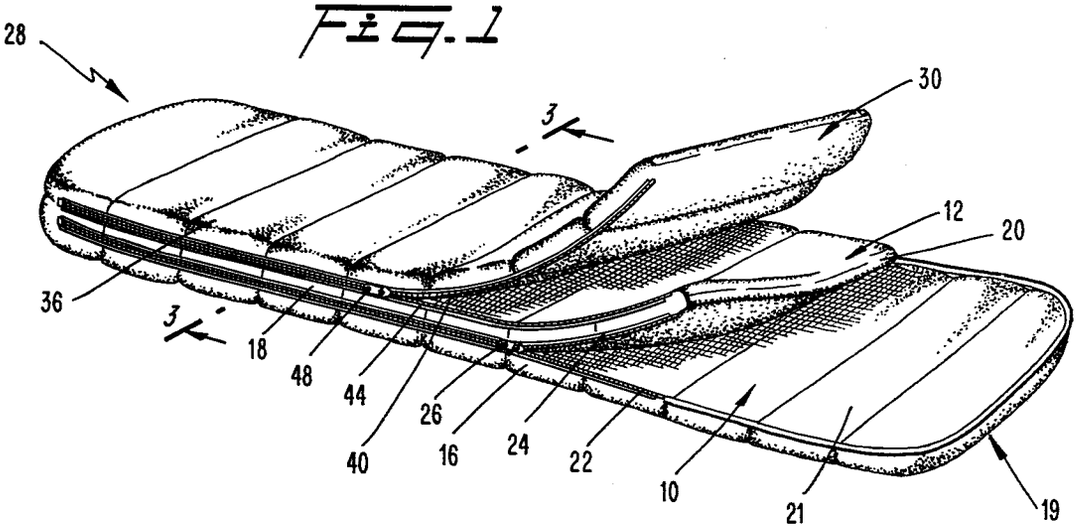
Fig. 1



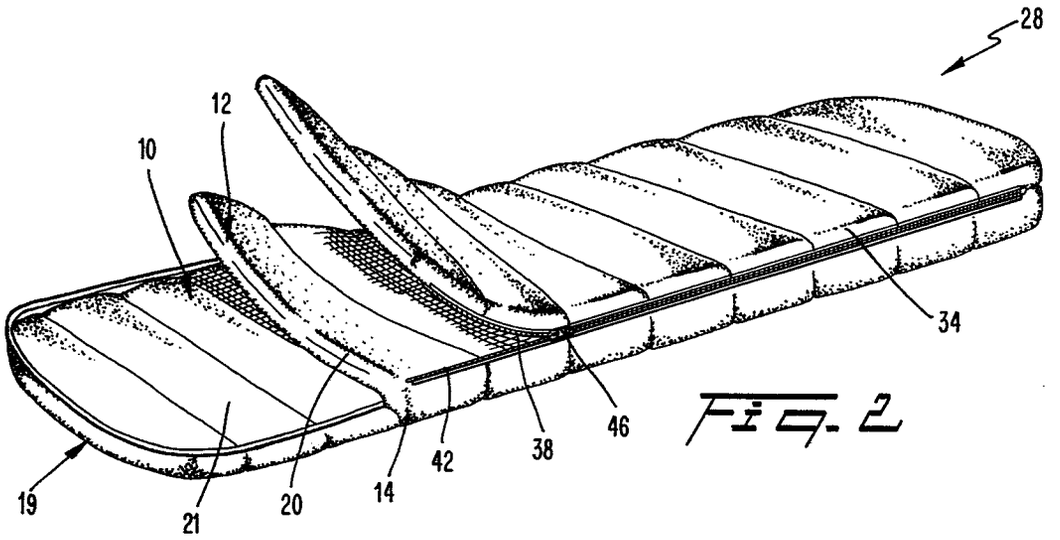


Fig. 2

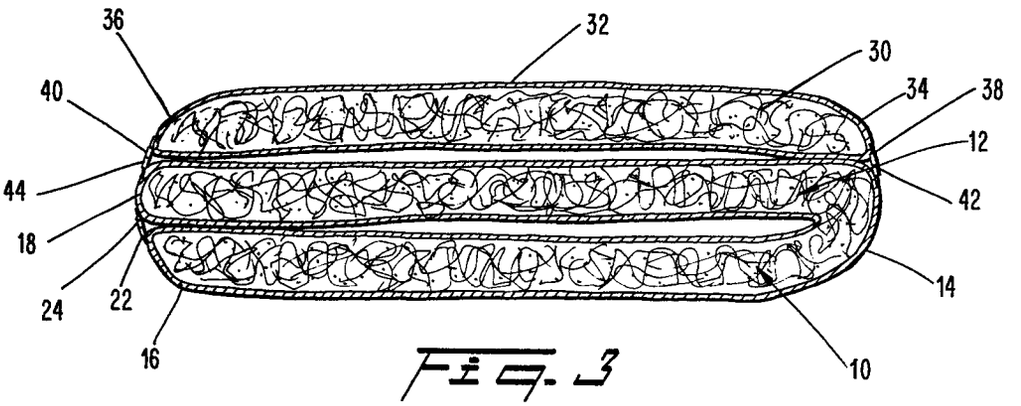


Fig. 3