

March 15, 1949.

O. C. DAIBER
INSULATED STRUCTURE

2,464,380

Filed Feb. 17, 1942

2 Sheets-Sheet 1

FIG-2

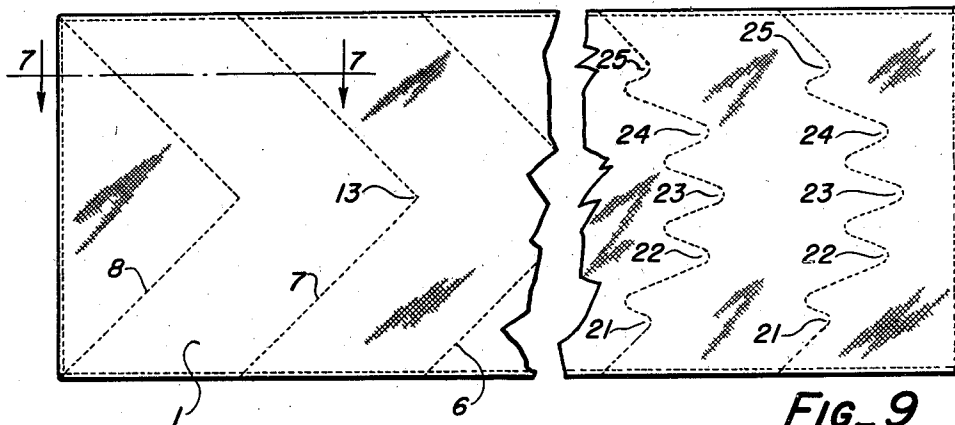


FIG-9

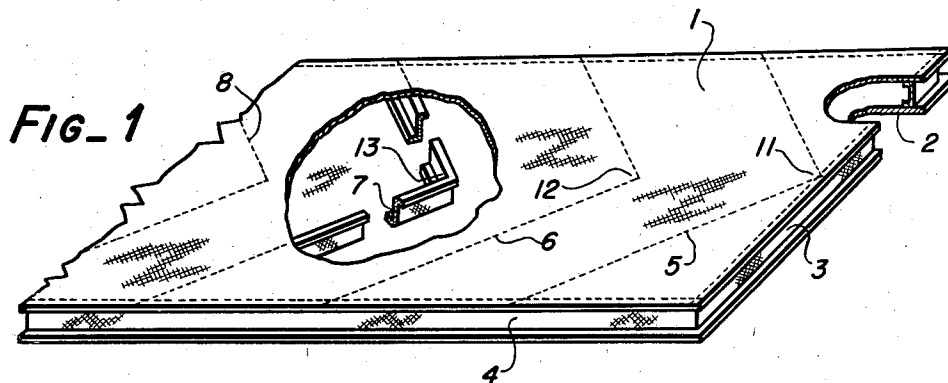


FIG-1

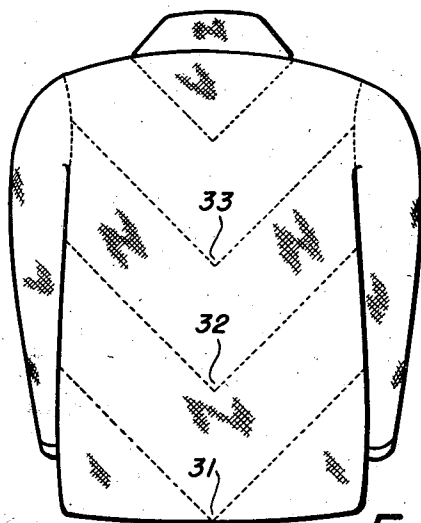


FIG-4

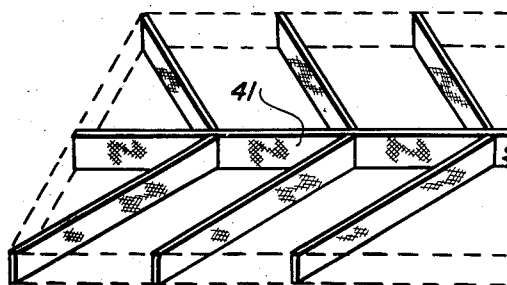


FIG-3

OME C. DAIBER
INVENTOR

BY

Smith & Luck
ATTORNEYS

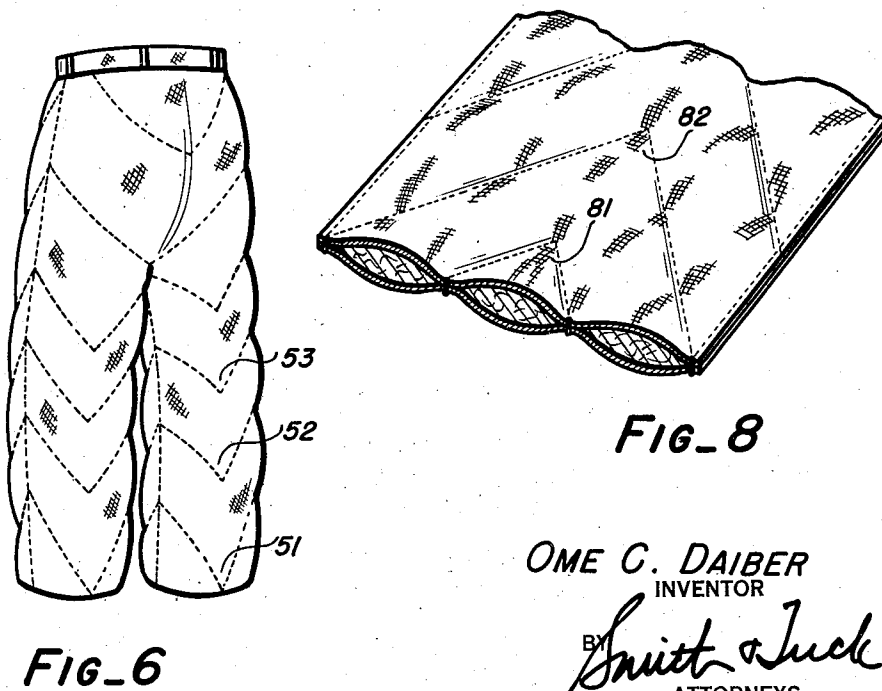
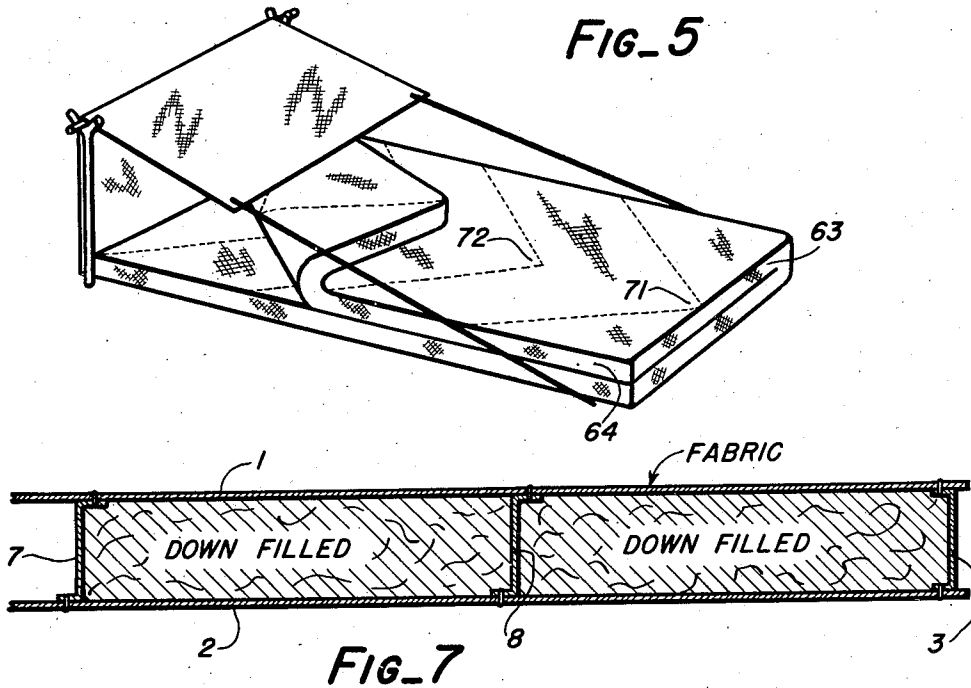
March 15, 1949.

O. C. DAIBER
INSULATED STRUCTURE

2,464,380

Filed Feb. 17, 1942

2 Sheets-Sheet 2



OME C. DAIBER
INVENTOR

BY *Smith & Jack*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,464,380

INSULATED STRUCTURE

Ome C. Daiber, Seattle, Wash.

Application February 17, 1942, Serial No. 431,256

2 Claims. (Cl. 2—243)

1

The present invention relates to improvements in the construction of an insulated structure. In more particular, it relates to improvements in the construction of articles of clothing such as coats and trousers, as well as comforters, robes and sleeping bags adapted to be filled with down, cut feathers, or other discrete insulating material.

In the prior art, down jackets, pants and sleeping bags have been filled with down and then quilted in a variety of different patterns, such as horizontal or vertical tubes, squares, diamonds and the like. The purpose of all this quilting of the prior art has been to localize the down or other insulating material so that its movement in the article would be more or less restricted. The use of small squares has resulted in localizing the down so that a desired initial distribution could be had, but this has meant that the initial placing of the down has been the final placing and that it could not be shifted when in use to meet varying conditions of temperature, wind, and individual peculiarities or requirements. The placing of the down in small pockets has also resulted in undue packing of the down and difficulty in refuffing to obtain maximum insulation values. Placing of the down in vertical tubes has usually meant that, after a short period of use, the down would shift to the lower end of the tube, and difficulty would be found in again evenly distributing the down through the tube. If the tubes were horizontal, such as on a jacket, it was found that the down would be at the ends of the tubes under the arms, along the sides of the jacket, and that the back would be free of down. This was due to the compacting and compression of the jacket across the back. This same condition would exist in a sleeping bag; where a person was sleeping on the central portion it was found that the down would soon be at the edges of the bag and the person would be sleeping very much upon the ground uninsulated as intended.

The prior art method of quilting in which the outer and inner membranes of the material were simply sewed directly together has meant that along the seams the insulation material has been crowded out and a thin spot results through which heat conduction has been very rapid, resulting in cold spots and a general reduction in the overall insulating value of the material.

Having in mind these defects of the prior art, it is an object of the present invention to construct an insulated member adapted to be filled with down or similar discrete insulating material

2

in which the insulating material may be easily shifted about from one part to another of the structure to obtain the desired insulating value at various points in the structure, and yet which structure will cause the down to be retained in the desired location.

A further object of the present invention is the construction of down-filled jackets or trousers in which the down will tend to stay in the medial portions of the garment, such as along the back of a jacket and the back and front of the legs.

Yet another object of the present invention is the construction of a sleeping bag filled with down or similar discrete material wherein the down may be easily placed along the medial lines of the bag.

Another object of the present invention is the construction of an insulated structure or garment having a series of elongated compartments each including a material localizing pocket or pockets, said compartments and pockets being of a size to allow easy shifting therethrough of a discrete insulating material loosely placed therein.

A still further object of the present invention is the construction of an insulated structure or garment having a series of elongated V-shaped compartments, each including a material localizing pocket or pockets, the compartments and pockets being of a size to allow easy shifting therethrough of, and having placed therein, a discrete insulating material.

Another and further object of the present invention is the provision in an insulated structure or garment of webbing connecting the inner and outer membranes of the garment and determining the spacing apart of said membranes, and forming therewith a series of compartments.

These defects of the prior art have been remedied and these objects attained by the construction of an insulated structure or garment having inner and outer membranes which are spaced apart by means of a webbing which determines the spacing of said membranes and forms therewith a series of elongated compartments each including a material localizing pocket, such as the formation of compartments in the form of V's with the point of the V forming a material localizing pocket, or the provision of several pockets which are in communication to form a compartment. The invention includes forming compartment pockets of a size to allow easy shifting therethrough of, and having placed loosely therein, a discrete insulating material such as down. In the construction of a jacket the point of the V of the compartment is placed medially of the

3

jacket and pointing downwardly, so that in wearing the jacket, the down will tend to accumulate along the middle of the back and to be fairly evenly distributed over the back in spite of compression or collapse during the wearing action tending to force the down outwardly toward the sides of the jacket. This construction may also be used in trousers and in sleeping bags.

As will be apparent from the hereinafter disclosure, these objects and others are obtained, and these defects remedied by means of the devices and construction shown in the accompanying drawings, wherein:

Figure 1 is a perspective view of a portion of an insulated structure, such as a sleeping bag, embodying the present invention.

Figure 2 is a plan view of a portion of a structure similar to that shown in Figure 1.

Figure 3 is a perspective view of a modified webbing assembly.

Figure 4 is an elevation view of the back of a jacket embodying the present invention.

Figure 5 is a perspective view of a sleeping bag embodying the present invention.

Figure 6 shows the application of the present invention to a pair of trousers.

Figure 7 is a sectional view in elevation on the line 7-7 of Figure 2.

Figure 8 is a modification of the present invention showing a construction wherein webbing is not used.

Figure 9 is a view similar to Figure 2 showing a modification.

Figure 1 shows two membranes 1, 2 which have their spacing determined by means of a series of strips of webbing 3, 4, 5, 6, 7, 8 and so forth. The membranes 1, 2 may be made of any fabric such as balloon silk, lightweight canvas, or other suitable material, and the webbing may be of a similar material. The webbing 3, 4 is used to define the outer edges of the structure, while the inner webbing 5, 6, 7, 8 is placed in the form of V's. Each of the inner points 11, 12, 13 etc., of the V's form a localizing pocket which will tend to retain the down in that portion of the V-shaped compartment. In many of the prior art devices it has been the practice to make the tubes containing the down of a rather narrow construction so that the down could not easily move along the tube and hence would tend to remain in position. This structure has resulted in undue compacting of the down, thus increasing the weight of down necessary as well as shortening the life of the down, due to the packing effect.

Applicant has found that by means of the use of localizing pockets he can use much less down for a given insulation value and also make his pockets or tubes much wider so that the down may more easily move along the tubes with the result that the down is not compacted, and the life of the down is increased. The actual width of the tubes is a matter of judgment, but they should be wide enough so that the down can be moved rather easily along the tubes by shaking or patting the garment or structure. If a V-shaped tubular construction is not used, the width or cross-sectional area of the tube should still be sufficient and the loading of material into the tube should be light enough so that upon patting or shaking the material it will move rather easily along the tube. Of course, the down should not be compacted or crushed by the initial filling to such an extent that movement of the down along the tubes is rendered difficult if not next to impossible.

4

As is clearly evidenced from Figure 1 the edge panels or webs as well as the central V webs are stitched both to the upper and lower membranes.

Figure 2 shows a plan view of a portion of the structure shown in Figure 1, while Figure 9 shows a modification thereof particularly useful in very wide structures such as double sleeping bags, where a series of pockets 21, 22, 23, 24 and 25 may be formed across the width of the structure so that the insulation material may be retained in the desired position by the individual pockets, and prevented from moving along the tube thereby.

Figure 4 exemplifies the present invention applied to a jacket. It will be noted that the down-retaining pockets, 31, 32, 33 and so forth are ranged along the medial portion of the back of the garment. As the garment is used and pressure is applied across the back of the garment, the pressure will tend to force the down to the edges of the jacket underneath the arms, but this tendency will be counteracted by the U-shaped construction of the down compartments which will tend to work the down toward the middle of the jacket and, hence, to give a uniform insulation across the jacket. This tendency may be predetermined and altered as desired by varying the angle of the V's, or by constructing the quilting or webbing with a series of V-shaped intercommunicating pockets across the back, in the manner shown in Figure 9.

Figure 3 shows a further modification of the present invention, in which an added web 41 has been applied medially of the insulating members in order to divide the down evenly between the two sides of the V-shaped compartments of the structure. Figure 6 shows the present invention applied to a pair of trousers having inner and outer membranes, and webbing or quilting to form V-shaped localizing pockets 51, 52, 53 etc. It is believed that the construction thereof is evident from the previous discussion.

Figure 5 illustrates the present invention applied to a sleeping bag. As the bag is laid on the ground, it may be shaken gently from the head, which will fluff the down and cause it to move toward the center where the most insulation is needed. The use of webbing 63, 64, etc., to space the membranes apart and to form the pockets 71, 72, etc., greatly facilitates this movement because it does not pinch the down at the edges of the compartments and also aids in increasing the even distribution of the down because of the lack of thin spots at the edges of the compartments or tubes.

Figure 8 is a modification of the present invention, showing the formation of V-shaped compartments 81, 82 without the use of webbing to space the two membranes apart.

In the present invention it has been found that down may be easily localized without unduly compacting it, thereby giving a lighter structure and that without the formation of small separate compartments. The present invention allows the down to be shifted about as desired, and yet tend to remain in the desired position. It also allows a construction in which the down will automatically return to the desired location when, due to usage and stretching of the material, it is moved from such position, as by the use of the parallel V-shaped compartments such as shown in the jacket of Figure 4.

It has also been found that this regulation of the depth and the location of the down may be materially enhanced by the use of the webbing

5

shown in the various modifications. Garments made in accordance with the above disclosures are lighter and warmer and more serviceable than those of the prior art.

The membrane referred to here is any thin, soft, pliable sheet or layer of animal, vegetable or mineral material such as a sheet of paper, cloth, skin, or the like.

The webbing may be of the same material as the membranes or any piece of textile of similar material, of considerable length, fair breadth, and little thickness.

The term "filling said compartments," when used in reference to the material therein, is used to designate the desired amount of material without reference to the actual quantity or density thereof. The term "garment" is used to designate an article of personal wearing apparel such as coats, jackets, trousers, sleeping bags, etc.

Having thus described my invention, I claim:

1. A garment, comprising: inner and outer membranes, forming a series of nested and closed downwardly pointed elongated V-shaped compartments, with the apex of each V-shaped compartment being closed to prevent communication between the two legs of such compartment; said compartments being of a size to allow easy shift-

6

ing therethrough of, and having placed loosely therein, a discrete insulating material.

2. A garment panel, comprising: means forming a single series of elongated closed V-shaped compartments with the points of said compartments placed medially of the garment, all of said compartments having the points thereof unidirectionally disposed and being of a size to allow easy shifting therein of, and having placed loosely therein, a discrete insulating material.

OME C. DAIBER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
925,851	Sullivan	June 22, 1909
1,421,131	Abrams	June 27, 1922
1,394,061	Bernstein	Oct. 18, 1931
2,164,499	Coughlin	July 4, 1939

FOREIGN PATENTS

Number	Country	Date
49,761	Denmark	Jan. 14, 1935