

Nov. 4, 1969

S. J. SARNOFF
THERMAL TRANSFER GARMENT AND THERMAL
TRANSFER PACKET THEREFOR

3,476,102

Filed Sept. 27, 1967

2 Sheets-Sheet 1

Fig. 1.

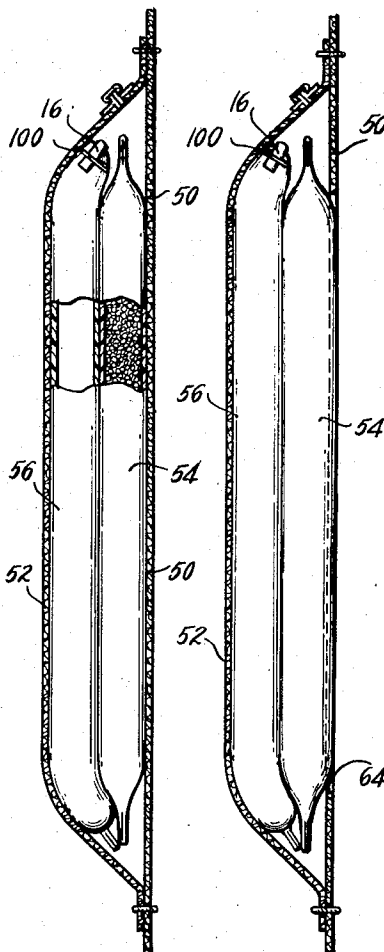
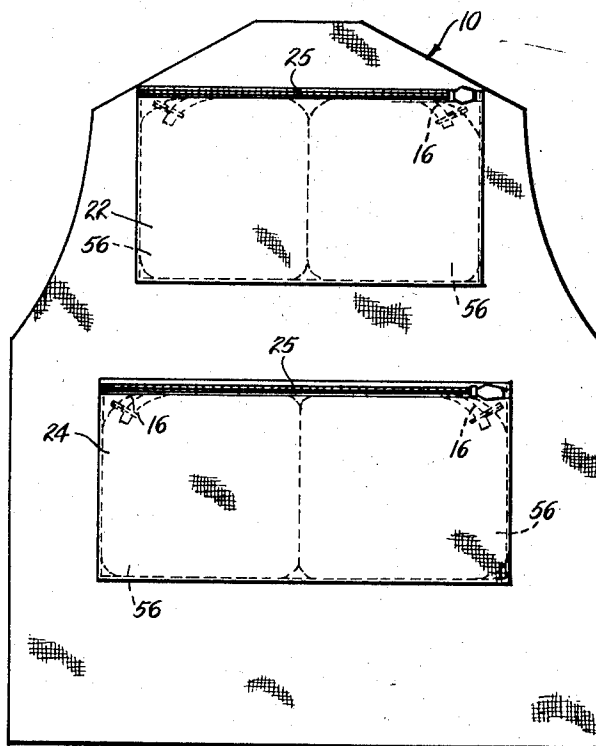
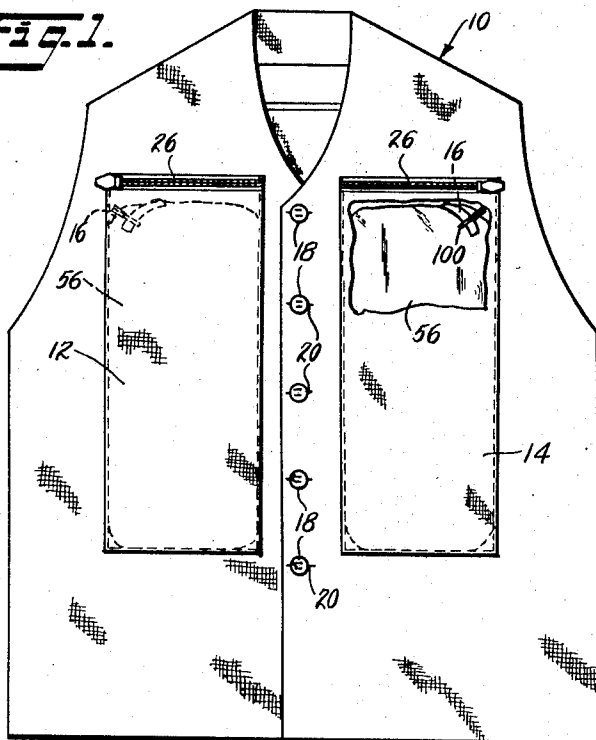


Fig. 5.

Fig. 6.

Fig. 2.

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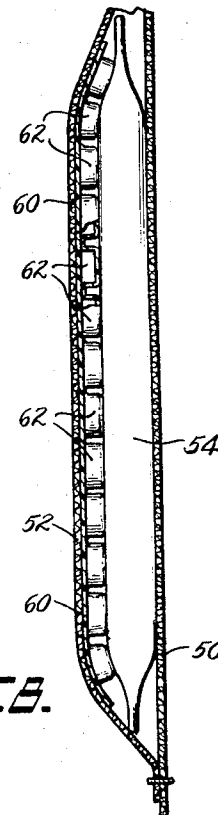
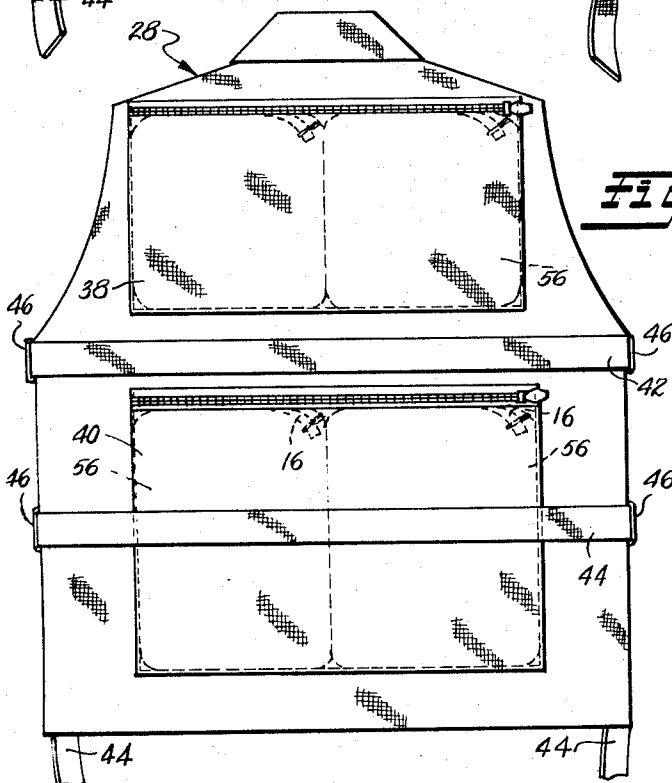
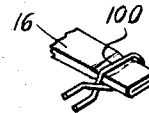
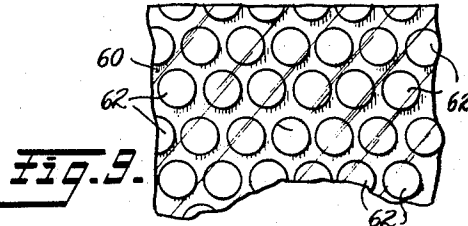
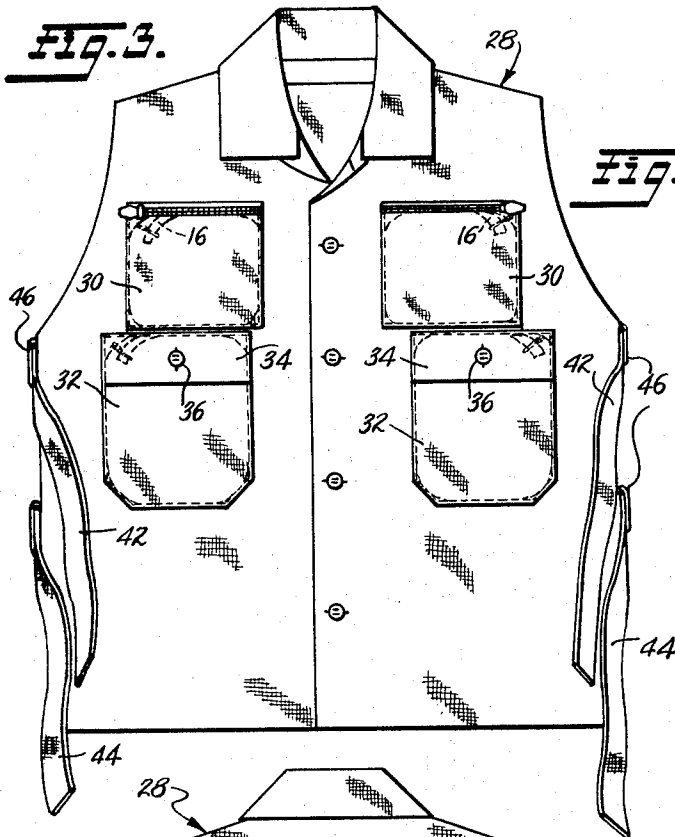
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THERMAL TRANSFER GARMENT AND THERMAL TRANSFER PACKET THEREFOR

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11 Claims

ABSTRACT OF THE DISCLOSURE

A garment with pockets for receiving thermal change creating packets may be provided with a belt or belts at several elevations of the garment to enable good physical contact of the pocket portions of the garment with the body of the wearer. The inner portion of the garment is made of moisture absorbent material and the pockets, or the packets themselves, may be provided with inflatable bladders, so that when the bladders are inflated the packets will be pressed into good thermal transfer contact with the body of the wearer. In lieu of the bladders or in conjunction with them a heat insulative sheet of material may be inserted between an outer wall of the pocket and the packet.

THE INVENTION

The invention relates to a garment especially designed for facilitating heat transfer between a patient and thermal change creating packets in pockets in the garment. The invention further relates to the combination of that garment with a thermal change packet especially designed for the garment and in the association with that packet of a bladder for effecting pressure of the packet toward the body of a wearer of the garment. Also the invention relates to the use of a heat transfer insulating sheet between an outer wall of the pocket and the packet.

A general object of the invention is to provide a means to effect efficient heating or cooling of a patient wearing a pocketed garment with thermal change creating means in the pockets of the garment.

A specific object of the invention is to provide inflatable fluid pressure means in the pockets of the garments to enable thermal change creating packets also in the pockets to be thrust forcibly against the body of a wearer of the garment.

Another specific object of the invention is to provide heat transfer insulative means between a thermal change creating packet and an outer wall of a pocket in a garment within which the packet is located.

Still another specific object of the invention is to provide special belt means on the garment to hold the thermal change creating packets firmly against the body of the wearer of the garment.

Yet another specific object of the invention is to provide moisture absorbent means on the inside of a garment forming one wall of a pocket to facilitate heat transfer between the packet and the body of the wearer of the garment.

Also it is an object of this invention to provide a thermal change creating packet with an inflatable bladder so that when the combination of packet and bladder is inserted into the pocket of a garment and the bladder is inflated, pressure of the bladder against a wall of the pocket will cause a reacting pressure to be applied to the associated thermal change creating packet and in a direction toward the interior of the garment, or toward the body of the wearer of the garment.

Other objects will become apparent after consideration of the following specification when considered in conjunction with the accompanying drawings in which:

FIG. 1 is a front view of one form of a garment, as a vest, made in accordance with the invention, with thermal change creating packets in the pockets of the garment;

FIG. 2 is a back view of the same garment or vest;

FIG. 3 is a front view of a second form of garment made in accordance with the invention, as in the form of a waistcoat having a collar, also with thermal change creating packets in the pockets of the garment;

FIG. 4 is a back view of the garment shown in FIG. 3;

FIG. 5 is a section through a typical pocket in one of the garments showing the thermal change creating packet and associated bladder in place.

FIG. 6 is a sectional view of a modified form of pocket and associated elements therein to better expose a thermal change creating packet to the body of the wearer of the garment;

FIG. 7 is a view of a valve in conjunction with a hose, the hose being, preferably, attached to a corner of the bladder, which valve may be used in conjunction with the hose to control air flow to and from the bladder;

FIG. 8 is a view partly in section of a pocket provided with a heat transfer insulative sheet which may be used in conjunction with the bladder, and

FIG. 9 is a fragmentary plan view of an insulating sheet which may be used in carrying out the invention.

Now referring to the drawings in greater detail;

At 10 in FIG. 1 is shown a vest. This vest has two large pockets 12 and 14 on the front halves thereof designed to receive therein the thermal change creating packets to be described in greater detail. Within the pockets are hose connections 16 leading to bladders which may be associated with the packets.

The vest is provided with a large number of buttons 18 and associated button holes 20 and is of a size to fit rather snugly about the body of the wearer of the vest.

The back of the vest is also equipped with a multiplicity of pockets, as pockets 22 and 24, each designed to receive a thermal change creating packet or a multiplicity of such planar aligned packets. The tops of the pockets may be equipped with zippers, indicated at 25.

In FIGS. 3 and 4 there is illustrated a sleeveless jacket 28 or waistcoat with attached collar. The front of the jacket on each side is provided with a pair of pockets, as pockets 30 and 32, each of the pockets 30 being closed off by a zipper while each of the pockets 32 may be closed off by a flap 34 buttoned to the outside wall of the pocket, as by means of button 36. The back of this garment is provided with pockets, as pockets 38 and 40 which may be duplicates of those described on the back of the vest and closed off by zippers in like manner as the pockets of the vest, these pockets being adapted to carry packets and associated bladders of which the hose connections 16 are visible in full lines in FIG. 1.

In addition to the buttons 36, for tightly fitting the jacket about the wearer, there is provided one or more belts. Illustrated is a pair of belts, indicated at 42 and 44, passing through loops 46, affixed to the garment as is conventional in the art, these belts being spaced vertically of the garment, sufficiently close enough to ensure that there be no bulging of the packets away from the body of the wearer.

Referring to FIG. 5 there is shown a sectional view through one of the pockets with a packet and bladder therein. The garment or the portion of the garment 50 opposite the thermal change creating packet and forming the inner wall of the pocket is made of any suitable material preferably of wool or cotton, capable of absorbing the moisture of the body of the wearer of the garment. Such a material is preferable to non-absorbent materials as Dacron, nylon or the like since the fabric

when it does become moist becomes a better heat transfer medium than when dry while the synthetic fibers are non-porous, and do not have this property. The outer wall 52 may be made of any strong material sewed or otherwise fastened to the inner wall of the garment to form a pocket open at the upper edge whereat the pocket is provided with a closure means here illustrated as a zipper though obviously it could be a flap or other closure means or could even be left open. Within the pocket is located a thermal change creating packet 54 of a conventional character, for example, the two leaf sack shown in Amador 3,149,943 and which may either be of the exothermic or endothermic type. Such a packet may contain chemicals which when permitted to react with each other will create a sensation of heat or cold dependent on the chemicals utilized. Between the packet 54 and the outer wall 52 of the pocket there may be inserted the bladder 56 which may be two sheets of thermoplastic material heat sealed about the edges with a hose connection 16 leading thereto. Suitable valving means may be applied to the bladder connection to enable inflation of the bladder. When the garment is worn and the bladder is inflated, the pressure of the bladder reacting against the outer wall 52 of the pocket will cause the packet 54 and inner wall 50 to press hard against the wearer effecting good thermal transfer to occur between the packet and the body of the wearer of the garment. The bladder and packet may either be separate units or less preferably secured together to form an integrated unit.

The bladder, it will be noted, with the air therein forms an efficient heat insulator and hinders heat transfer from the packet of the outer wall 52 of the pocket. Where pressure is otherwise obtained than by utilizing the bladder, as where belts 42, 44 are relied upon to secure close fit of the garment onto the wearer, the heat insulating sheet 60 may be substituted for the bladder. One form of such a sheet is illustrated in FIG. 9. It comprises a transparent sheet of synthetic material having planar surfaces on one of which is uniformly distributed a profuse number of air pockets 62 integral with the sheet. Of course, any other heat insulating shield may be utilized.

In the modification of pocket shown in FIG. 6, part of the inner wall of the pocket may be removed leaving a window 64 so that direct body contact may be made with the packet 54.

The bladder may be inflated by any conventional means as by a hand pump such as are used on perfume bottles to increase the air pressure in a bottle or by an aerosol bomb. The hose 16 of the bladder may be provided with any form of valve arrangement to transmit air under pressure to the bladder and retain the air therein or to release the air therefrom. A simple form of valve is a spring member forming a pinch valve as illustrated at 100 in FIG. 7. The spring pressure of the valve could be light enough to admit a flow of high pressure fluid to the bladder during pump manipulation and bladder inflation yet strong enough to retain the desired pressure within the bladder when pumping ceases. Obviously, squeezing the free ends of the pinch valve together will permit diminution of air pressure within the bladder. After inflation, the hose and valve may be tucked into the pocket and the zipper or other closure means operated to close off the pocket opening.

The bladder not only serves to press the packet against the body of a wearer of a garment but to act as a heat insulator. However, where pressure is not of paramount importance or where the straps on the garment or tight buttoning of the garment is relied upon to secure intimate heat transfer relationship between the packet 54 and the body of the wearer of the garment, the bladder may be replaced by a heat insulating sheet as by the sheet 60

illustrated in FIG. 8. This sheet may be interposed between the packet and the outer wall 52 of a pocket to prevent undesired heat transfer therebetween.

Having thus described the invention, what is claimed is:

1. A garment having a pocket with an exterior wall, and a wall in the interior of the garment, a packet in said pocket with means in the packet to create a thermal change therein, a bladder in said pocket interposed between said packet and said exterior wall of the pocket so that when the bladder is inflated the packet will be thrust toward the interior wall of the garment, and means communicating with the interior of the bladder whereby the bladder may be inflated and maintained in inflated condition.

2. The combination of claim 1, wherein the interior wall is of moisture absorbent material to promote thermal conduction between the packet and the body of the wearer of the garment.

3. The combination of claim 2, wherein a portion of the interior wall opposite the packet is cut away to enable direct contact of the body of the wearer of the garment with the packet.

4. The combination of claim 1, wherein the packet contains chemicals which when permitted to react will create heat.

5. The combination of claim 1, wherein the packet contains chemicals which when permitted to react will create a cryogenic effect.

6. The combination of claim 1, wherein the bladder and the packet are integrated into a single unit.

7. An assembly comprising a packet containing chemicals which when brought into contact will react to produce a thermal change, and a bladder secured to an exterior portion of said packet operative, when the assembly is inserted within a garment with the bladder outermost with respect to the interior of the garment and the bladder is inflated, to cause the packet to be thrust toward the interior of the garment.

8. An assembly as set forth in claim 7, wherein the bladder is provided with a hose, a valve cooperating with the hose to enable fluid to be fed into, held in, and bled from the bladder.

9. An assembly as set forth in claim 7, wherein the packet comprises a two leaf sack with the leaves folded over one another, and the bladder is secured to the outer face of one of the leaves.

10. An assembly as set forth in claim 9, in which the bladder is at least coextensive in area with the area of one of said leaves.

11. A garment for use with a thermal packet for effecting heat transfer between the packet and the body of a wearer of the garment, said garment having at least one pocket with an outer wall and an inner wall in the interior of the garment, said pocket being adapted to receive a thermal packet for effecting heat transfer between the packet and the body of the wearer, the inner pocket wall being in intimate heat transfer contact with the wearer, a portion of said inner pocket wall being cut away to provide direct bodily contact of a portion of the thermal packet, heat insulating means in said pocket between the packet and the outer pocket wall and means for snugly holding the inner pocket wall in intimate contact with the wearer.

References Cited

UNITED STATES PATENTS

2,397,232	3/1946	Barnes et al.	126—204 X
2,648,325	8/1953	Siple	126—204
3,149,943	9/1964	Amador	62—4
3,175,558	3/1965	Caillouette et al.	126—204 X

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