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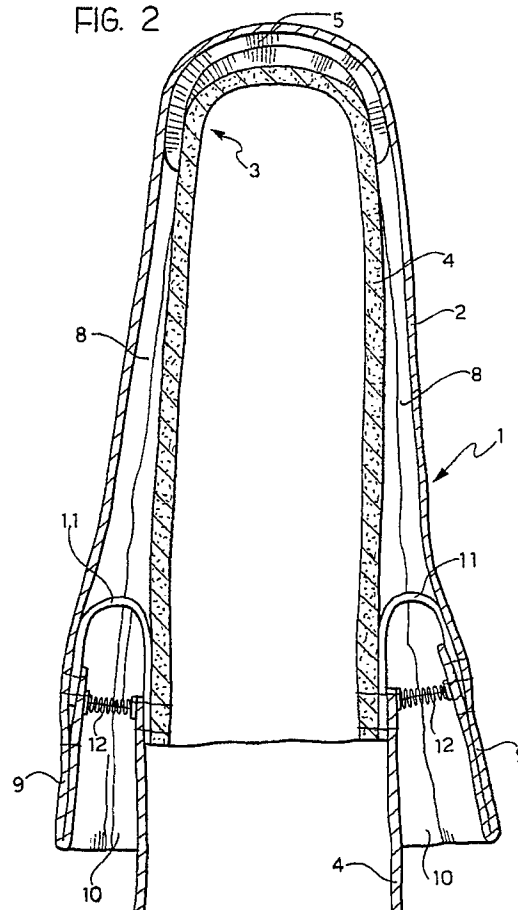
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(54) **A heavy-duty garment with an adjustable ventilation device.**

(57) In correspondence with its front and rear shoulder parts, the garment has an inner fabric (4) which is very permeable to air and is spaced from the outer fabric (2) so that air can circulate between the front and rear parts of the garment in the spaces (8) thus formed. The spaces (8) communicate with the outside through apertures (10) controlled by adjustable closures (12) and resilient means (11) are provided in correspondence with the apertures (10) for spacing the two fabrics (2, 4) apart by a distance proportional to the extent of the aperture so that the internal ventilation of the garment can be adjusted in dependence on the degree of humidity created within it in use.

FIG. 2



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A HEAVY-DUTY GARMENT WITH AN ADJUSTABLE VENTILATION DEVICE

The present invention relates to heavy-duty garments such as overalls, jackets, coats or jerkins, for use, for example, by military personnel, firemen or forest fire fighters.

As is known, these garments have to be made from fabrics which, since they must have good mechanical strength, are practically impermeable to air and cannot therefore breathe adequately. This problem is even worse if the fabric is treated to make it waterproof.

In fact, water-proofing and breathability are conflicting characteristics such that, if waterproofing is given priority in the manufacture of a garment, the garment does not breathe adequately and vice versa.

It has been proposed to solve this problem by the use of microporous films but garments made with the use of these films have not given good results in cases where the perspiration caused by prolonged physical effort has led to substantial increases in the degree of humidity within the garment since the porosity of the fabric is insufficient to allow large quantities of moisture to be discharged to the outside.

The object of the present invention is to provide a completely satisfactory solution to the problem described above by virtue of the combination of characteristics which forms the subject of Claim 1 below.

Further characteristics and advantages of the present invention will become clear from the description which follows with reference to the appended schematic drawings, provided purely by way of non-limiting example, in which:

Figure 1 is a perspective view of a garment produced in accordance with the present invention,

Figure 2 is a partial section taken on the line II-II of Figure 1 on an enlarged scale,

Figure 3 is a perspective view of an internal part of the garment shown in Figure 1,

Figure 4 is a perspective view of a detail of Figure 3, and

Figure 5 is a section taken on the line V-V of Figure 3.

A heavy-duty garment generally indicated 1 is constituted, in the embodiment illustrated, by a coat which is intended to be worn by a forest fire fighter.

The coat 1 is made from a fabric 2 which has good mechanical strength and has been treated so as to make it waterproof.

The coat 1 has an inner part 3 which constitutes the yoke of the garment which is intended to bear against the user's body in use.

The inner part 3 is made from a fabric 4 which has an air-permeability factor of at least 6 mm/Pascal and a minimum thickness of 1.5 mm.

Spacer means, generally indicated 5, are provided at the shoulders for spacing the outer fabric 2 from the inner fabric 4 by a distance of at least 2 mm.

In the embodiment illustrated, each spacer 5 is constituted by a body of curved shape with internal ribs 6 forming channels 7 for ducting air between the spaces 8 between the outer fabric 2 and the inner fabric 4 in the front and rear parts of the garment.

Alternatively, the spacers could be constituted by applied raised elements or by a layer of very permeable fabric thicker than the fabric 4.

The air-permeable fabric 4 may be constituted, for example, by a layer of net fabric sandwiched between two layers of knitted fabric.

At the lower end of each space 8, the outer fabric 1 has a flap 9 in correspondence with which an aperture 10 is created which puts the space 8 into communication with the outside atmosphere.

An arcuate resilient element, indicated 11, is interposed between the lower end of the inner permeable part 3 and the flap 9 and tends to raise the flap 9 to a position in which the cross-sectional area of the aperture 10 is a maximum.

A closure 12 which, in the embodiment illustrated, is of the sliding-clasp type, is also provided and enables the cross-sectional area of the air passage through the aperture 10 to be adjusted against the action of the resilient means 11.

The internal ventilation of the garment can thus be adjusted in dependence on the degree of humidity created within it, in use, without thereby adversely affecting the waterproofing of the garment.

The closure 12 can be achieved by other means such as micro-hook adhesive strips, buttons, laces or the like.

Resilient means different from the arcuate resilient elements 11 shown by way of example could also be used provided they are adapted to fulfil the same function.

Claims

1. A heavy-duty garment, characterised in that:
 - a) it has an inner part (3), constituting the front and rear shoulder parts of the garment, which bears on the user's body, the inner part (3) being made from a fabric (4) having an air-permeability value of at least 6 mm/Pascal and a

minimum thickness of 1.5 mm,

b) spacer means (5, 6) are provided for spacing the outer fabric (2) of the garment (1) from the fabric (4) of the inner part (3) by a distance of at least 2 mm to enable air to circulate freely between the spaces (8) formed between the two fabrics (4, 2) in the front and rear parts of the garment,

c) the outer fabric (2) has apertures (10) controlled by adjustable closure means (12) and adapted to put the spaces (8) into communication with the outside,

d) resilient means (11) are provided in correspondence with each of the apertures (10) for spacing the outer fabric (2) from the inner fabric (4) to a degree proportional to the extent of the aperture, whereby the internal ventilation of the garment (1) can be adjusted in dependence on the degree of humidity created within it, in use, by means of the adjustable closure means (12).

2. A garment according to Claim 1, characterised in that each of the resilient means (12) is interposed between the lower end of the inner permeable part (3) of the garment (1) and a covering flap (9) which extends downwardly and is formed from the outer fabric (2).

3. A garment according to Claims 1 and 2, characterised in that each resilient means (11) is constituted by an arcuate resilient element.

4. A garment according to Claim 1, characterised in that the spacer means (5, 6) are fitted in correspondence with the shoulders.

5. A garment according to Claim 4, characterised in that the spacer means are each constituted by a body (5) of curved shape with internal ribs (6) which form channels (7) for the passage of air between them.

6. A garment according to Claim 4, characterised in that the spacer means are constituted by applied raised elements.

7. A garment according to Claim 4, characterised in that the spacer means are constituted by a layer of very permeable fabric, thicker than the fabric constituting the inner element.

8. A garment according to Claim 1, characterised in that the fabric (4) constituting the inner element is constituted by a layer of net fabric sandwiched between two layers of knitted fabric.

9. A garment according to Claim 1, characterised in that the outer fabric (2) is a waterproof fabric.

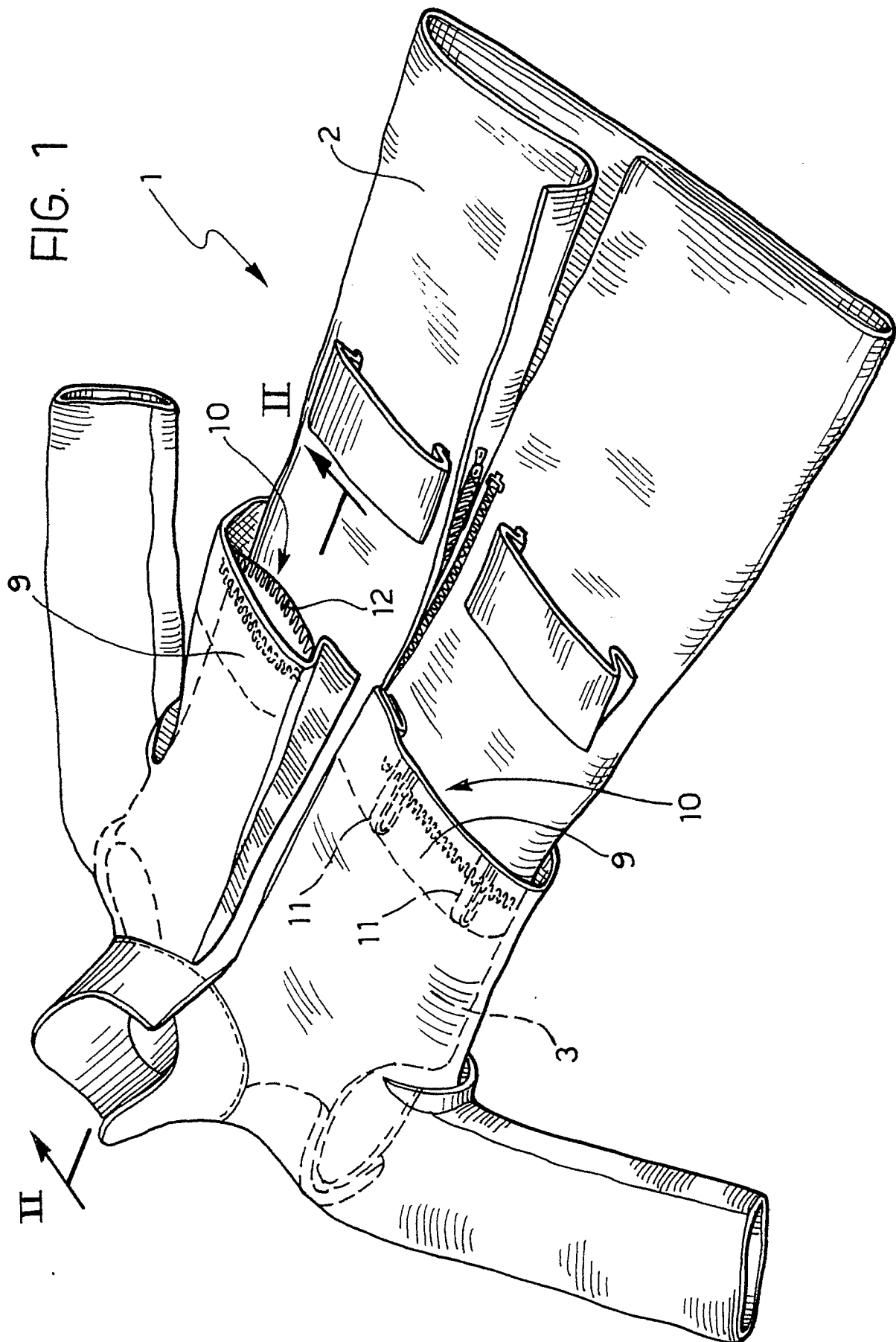
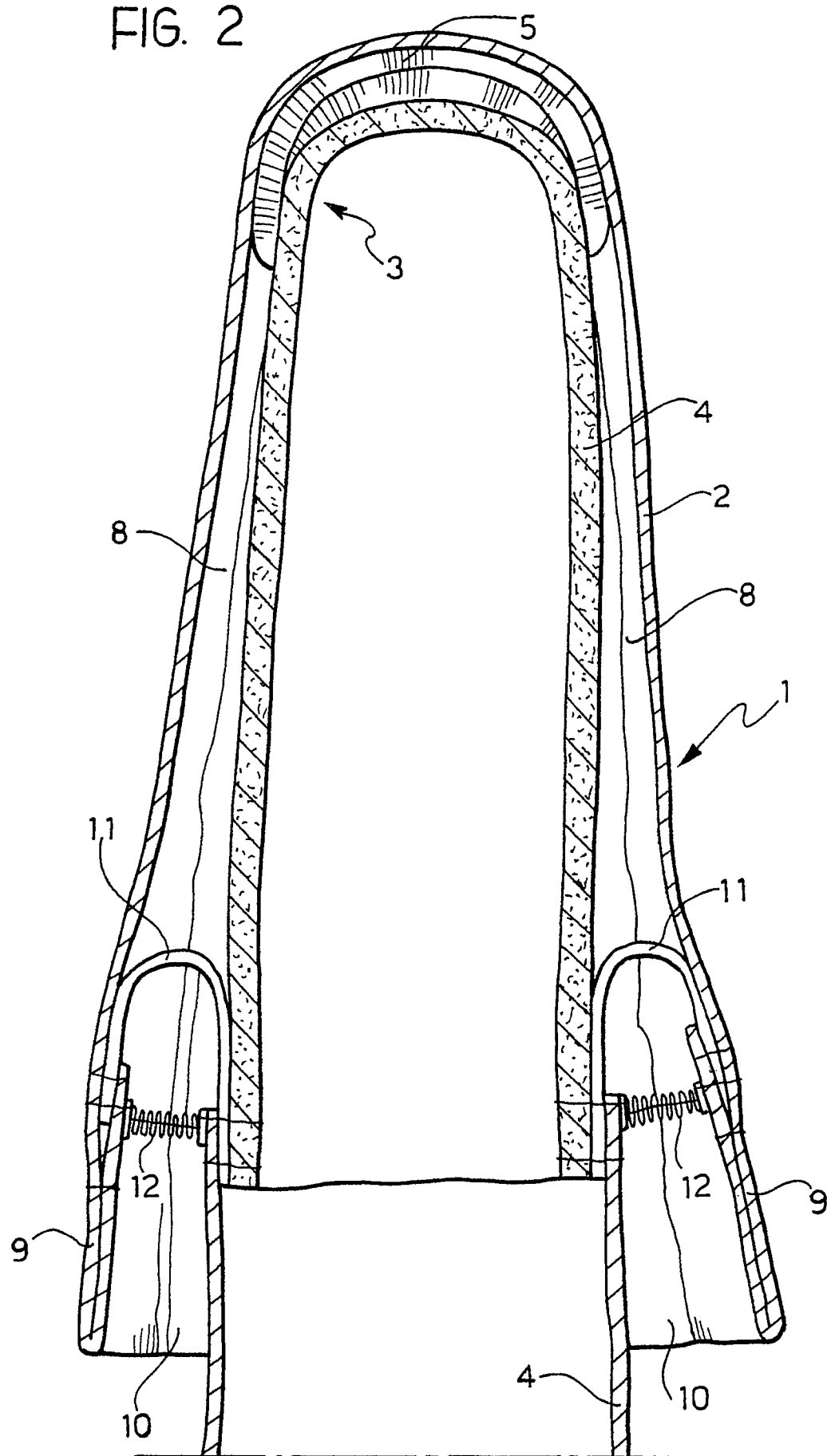
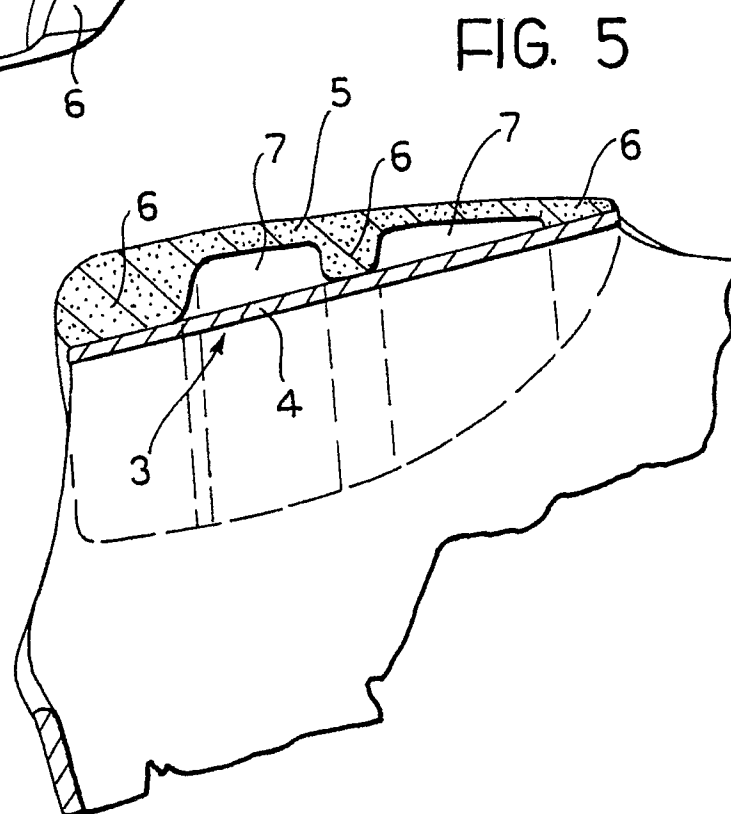
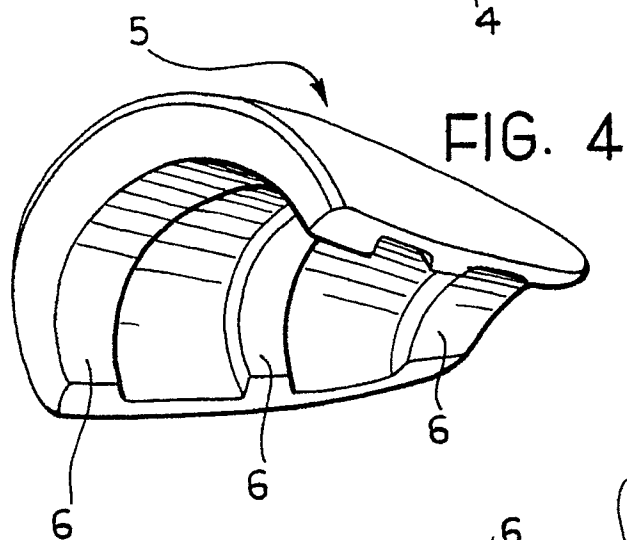
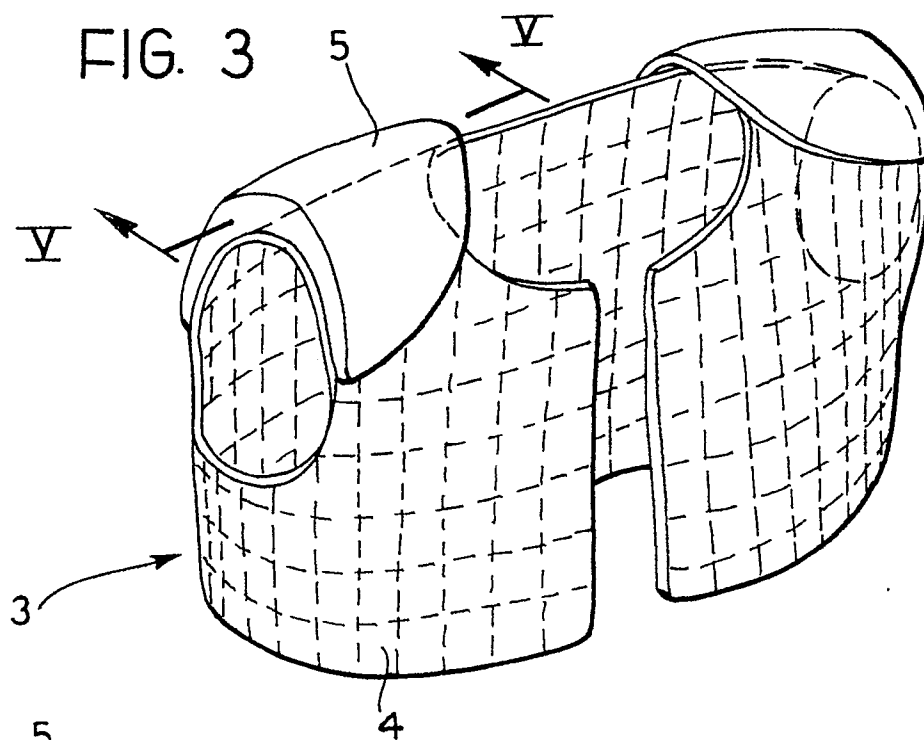


FIG. 2







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EUROPEAN SEARCH REPORT

Application Number

EP 90 11 4946

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-3 045 243 (S. LASH) * the whole document * - - -	1-3,9	A 41 D 13/00 A 41 D 27/28
A	US-A-3 296 626 (S. W. LUDWIKOWSKI) * column 3 - column 4, line 72; figures 1-8 * - - -	1,4-6	
A	US-A-1 360 391 (E. S. GILFILLAN) - - -		
A	GB-A-1 145 96 (C. B. SHANE) - - - - -		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A 41 D A 62 B
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		30 October 90	GARNIER F.M.A.C.
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