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(54) Upper garment with inner lining in the back piece for more freedom of movement and a refreshing feeling

(57) Upper garment manufactured from a fabric of which the stiffness may impede the freedom of movement of the wearer, such as the fabric of a nurse uniform, and comprises a front piece, a back piece, two sleeve bases and an inner lining, wherein the front piece and the back piece are connected to each other and the front piece is connected on each side to a sleeve base and the back piece is separate from the sleeve base, wherein the inner lining extends itself in the back piece substantially continuous over the entire width between the sleeve bases and is connected to the sleeve bases and is to a greater extent stretchable in comparison with the fabric of which the upper garment is manufactured.

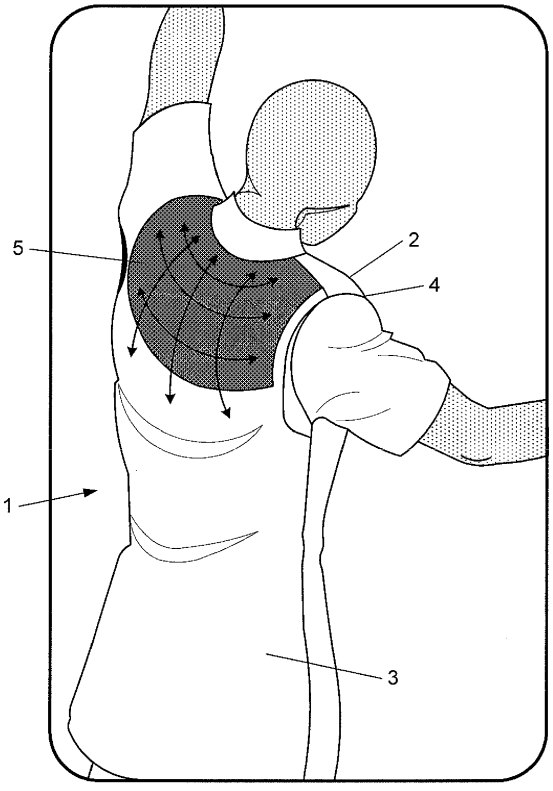

Fig. 1

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Description

[0001] The invention relates to upper garment manufactured from a fabric of which the stiffness may impede the freedom of movement of the wearer with an inner lining between the two sleeve bases.

[0002] Such an upper garment is known from the state of the art. CA10999452 describes an upper garment of stiff fabric with sleeves meant for nurses which comprises a front piece and a back piece and is provided with an underarm piece with an inner fold between each sleeve base and the back piece of the upper garment. Between the inner fold of each underarm piece and the back peace there is further still provided a stretchable intermediate piece, which extends itself stretchably upon tension in the upper garment to fold out the inner fold of the underarm piece. The stretchable intermediate piece serves in contracted state to hold the underarm piece in the folded state such that the underarm piece would not protrude and would as such adversely affect the wearing comfort and the aesthetics of the garment. The underarm piece simplifies stretching of the arm of the wearer without limiting the wearing comfort.

[0003] It is a disadvantage of such an upper garment that it, notwithstanding the stretchable intermediate piece, still impedes the movements of the wearer for example when bending over or lifting loads.

[0004] It is an aim of this invention to provide an upper garment which gives the wearer a greater freedom of movement and wearing comfort, especially when bending over or lifting loads.

[0005] This aim is achieved by means of the upper garment which shows the features of the first claim.

[0006] The upper garment according to the invention is manufactured from a fabric of which the stiffness may impede the freedom of movement of the wearer such as for example the fabric of a nurse uniform, and comprises a front piece, a back piece, two sleeve bases and an inner lining, wherein the front piece and the back piece are connected to each other by seam lines in longitudinal direction and are connected to each other at the top and the front piece is connected on each side to a sleeve base by seam lines and the back piece is separate from the sleeve base, wherein the inner lining extends itself in the back piece substantially continuous over the entire width between the sleeve bases and is connected to the sleeve bases by seam lines and is to a greater extent stretchable in comparison with the fabric of which the upper garment is manufactured, wherein the inner lining extends itself in the back piece substantially over the entire surface between the sleeve bases and up to the seam lines at the top of the upper garment and wherein the inner lining comprises a knitted or woven fabric which is stretchable in both the width and in the height direction of the upper garment.

[0007] The inventor has found that such an upper garment increases the freedom of movement of the wearer because the stretchable inner lining which extends itself in the back piece substantially over the entire width between the sleeve bases. Under load, for example of the back and movements of the arms when lifting or when bending over, the inner lining will stretch itself from a non-tensioned state to a tensioned state. The stretchable inner lining then increases in width between the sleeve bases and in length, and provides in such a way more freedom of movement to the wearer. Because the stretchable inner lining extends itself continuously over the entire width between the sleeve bases the tension is spread mainly even over the inner lining and decrease thereby the probability that the tensioned stiff fabric of the upper garment will shave the skin by friction. After the load is removed, the stretchable inner lining will return from a tensioned state to a non-tensioned state and the width of the inner lining between the sleeve bases and the length of the inner lining then takes back substantially the original values from before the stretching. Further, with an inner lining which extends itself in the back piece substantially over the entire surface between the sleeve bases the tension is distributed in an advantageous way over the entire surface of the inner linings, by allowing a sufficient large increase both in the length and in the width of the inner lining. By limiting the length in the height direction of the upper garment of the inner lining it is also possible to limit the surface of inner lining and save as such on material costs.

[0008] In a preferred embodiment according to the invention the inner lining is nearly not visible from the outside of the upper garment.

[0009] In a preferred embodiment according to the invention the inner lining is sewn in the back piece.

[0010] In a preferred embodiment according to the invention the inner lining comprises more than one layer.

[0011] Because the inner lining comprises more than one layer, each layer may fulfil a specific functionality, if this is desired. Therefore, it is not necessary to go look for one material which has all desired functionalities. Desired functionalities may for example be: a certain stretchability, a certain increased or decreased thermal insulation or a certain sweat absorption capacity.

[0012] In a preferred embodiment according to the invention the inner lining has an antibacterial effect. This has its advantages when wearing the upper garment in a medical context, in an environment where food products are treated or for example in a laboratory it may be of importance that the chance of bacterial contamination is reduced to a minimum.

[0013] In a preferred embodiment according to the invention the knitwear comprises polyester yarn.

[0014] The inventors have found that an upper garment with an inner lining which comprises a knitwear with polyester yarn provides an optimal combination of freedom of movement and wearing comfort to the wearer. Such a knitwear has preferably an open, breathing structure. The polyester yarn has a capillary action because of which the knitwear quickly absorbs moisture en dries quickly whereby the wearer has a continuously refreshing

feeling. Because the inner lining is pressed close to the skin under load, for example of the back and the movement of the arms when lifting or when bending over, the inner lining comes often in contact with sweat during the efforts of the user. The knitwear with polyester yarn absorbs sweat more quickly than natural fibres and has a quick drying function, such that there remains less sweat on the skin and the wearer has a pleasant, dry feeling during and after the efforts made.

[0015] In a preferred embodiment according to the invention the upper garment corresponds with a shirt, a tunic or a vest.

[0016] The invention will now be described further by means of an embodiment example shown in the drawing.

[0017] In the drawing:

Figure 1 shows a perspective view of an upper garment according to the invention;
Figure 2 shows a perspective view of an embodiment of the upper garment of the invention;
Figure 2A shows the embodiment of Figure 2 with the front piece 2 opened;
Figure 2B shows a detail of the shoulder from the perspective view of Figure 2;
Figure 2C shows a part of the inner lining;
Figure 2D shows a detail of the back piece from the perspective view of Figure 2 with the back piece left out of the figure to show the backside of the inner lining;
Figure 3 shows a back view of the upper garment according to an embodiment of the invention;
Figure 3A shows a section AA' of Figure 3;
Figure 3B shows a section BB' of Figure 3; and
Figure 3C shows a section CC' of Figure 3.

[0018] In the drawing the same reference number is assigned to the same or analogue element.

[0019] The present invention will hereafter be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. The dimensions and the relative dimensions do not necessarily correspond to actual reductions to practice of the invention.

[0020] Furthermore, the terms "first", "second", "third" and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. The terms are interchangeable under appropriate circumstances and the embodiments of the invention can operate in other sequences than described or illustrated herein.

[0021] Moreover, the terms "top", "bottom", "over", "under" and the like in the description and the claims are used for descriptive purposes and not necessarily for describing relative positions. The terms so used are interchangeable under appropriate circumstances and the embodiments of the invention described herein can operate in other orientations than described or illustrated herein.

[0022] The term "comprising" and derived terms, used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. It needs to be interpreted as specifying the presence of the stated features, integers, steps or components as referred to, but does not preclude the presence or addition of one or more other features, integers, steps or components, or groups thereof. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

[0023] The upper garment shown in the figures is a uniform of a nurse. It is however clear that in other embodiment examples other garments may be constructed with the technical features of the present invention such as coats or shirts or another garment which is worn on the upper body of an individual. The uniform of a nurse is typically manufactured from a fabric of which the stiffness may impede the freedom of movement of the wearer, such as for example cotton, linen or also polyester or a combination of these fabrics.

[0024] The upper garment 1 comprises a front piece 2 and a back piece 3, which are provided to respectively cover at least a front and a back part of an upper body of a person, two sleeve bases 4 and an inner lining 5.

[0025] The front piece 2 and the back piece 3 are connected to each other by seam lines in longitudinal direction. The front piece 2 and the back piece 3 may for example be stitched to each other, but any other suitable way of connecting two pieces of textile with each other by sewing lines are possible. The upper garment 1 according to the invention further comprises two sleeve bases 4 to which for example a sleeve may be connected. The sleeve bases 4 are adapted to receive therethrough the arms of a person. The sleeve base 4 is connected to the front piece 2 by means of a seam line and is separate from the back piece 3. It is for example possible to connect the sleeve base 4 with the front piece 2 by means of stitching.

[0026] The inner lining 5 stretches itself out in the back piece 3 substantially continuous over the entire width between the sleeve bases 4 and preferably the inner lining 5 stretches itself out substantially over the entire surface between the sleeve bases 4, such as is illustrated in figure 1. In figure 1 the part of the back piece 3 which covers the inner lining 5 is left out for clarity reasons. The inner lining 5 is attached in the back piece 3 by means of sewing, stitching or another way know by the person skilled in the art. The inner lining 5 is further connected to the sleeve bases 4 by seam lines. The inner lining 5 is to a greater extent stretchable in comparison with the fabric

of which the upper garment 1 is manufactured. The inner lining 5 may, depending on the desired properties, comprise one or more layers. This is especially interesting when different desired properties of the inner lining 5 may be united difficultly in one single layer material. For example, an antibacterial, a hygroscopic or a quick drying property may be desired. A knitwear with an open, breathing structures provides for example a distinctly comfortable wearing comfort with efforts of the wearer because of the air permeability. Air permeability is for example achieved by a fabric which is not coated and not laminated. A material which in this context enjoys the particular preference is polyester yarn, because it combines a good absorption of sweat with a quick drying function. Alternative materials are polymers which also promote the ergonomic functionality such as for example polyamide or polyprop. Besides the choice of the material also the shape of the yarn provides a better capillary action of the fibre material and thus a better water absorption.

[0027] When using the upper garment 1, the stiff fabric, which impedes the freedom of movement van de wearer, is exposed to a certain load for example when lifting loads or when bending over. The inner lining 5 will then under the influence of the load stretch itself from a non-tensioned to a tensioned state. The stretchable inner lining 5 consequently increases between the sleeve bases 4 in the length and in the width, and provides in that way more freedom of movement to the wearer because both stretching movements and bending movements or a combination thereof are taken care of by the inner lining 5 by means of stretching both in the length and in the width. Because the stretchable inner lining 5 extends itself continuously over the entire width between the sleeve bases 3 the tension is mainly spread out evenly over the inner lining 5 and thereby the probability decreases that the tensioned stiff fabric of the upper garment 1 will shave the skin by friction. The possibly present sweat on the skin of the wearer may then also be absorbed more evenly over the surface of the inner lining 5. After the load is removed, the stretchable inner lining 5 will return from a tensioned state to a non-tensioned state and the width of the inner lining 5 between the sleeve bases 4 and the length of the inner lining 5 then assumes again substantially the original values from before the stretching.

[0028] The used fabric for the inner lining 5 is a knitted or woven fabric with a weight of 80 gr/m^2 to 210 gr/m^2. The fabric is elastic because of the construction of the fabric, because of the chosen yarn of the fabric or because of a combination of these two. The fabric may be stretchable in a natural way or the fabric may stretchable because of the yarn. In an embodiment, the yarn is 100% polyester. This embodiment has as advantage to have a good water absorption, to have a good colour fastness when washing, sweating, rubbing and light, and to have a good dimensional stability. In a preferred embodiment of the invention the dimensional stability of the fabric for the inner lining 5 is maximum 3%. Shrinking is for example directly related to the dimensional stability of the fabric. In a further preferred embodiment of the invention the water absorption of the fabric for the inner lining 5 according to the standard AATCC 79 is lower than 1 second. In yet another embodiment of the invention the composition of the fabric is an industrially washable composition, and preferably a technical PES yarn which enhances the quick water absorption and the drying function.

[0029] Figure 2 shows a variant of the embodiment of Figure 1.

[0030] Figure 2A is the embodiment of Figure2 wherein the front piece 2 is opened such that the inner lining 5 becomes visible. Experimental measurements show that an embodiment such as shown in Figure 2A creates an extra moving space of 20% wrt an upper garment without the inner lining 5.

[0031] Figure 2B is a detail of the embodiment of Figure 2. Figure 2B illustrates the open space between the back piece 3 and the sleeve base 4. This open space provides an optimal use of the moving space between the shoulder and the underside of the shoulder blade.

[0032] Figure 2C shows the fabric which is used entirely or partially in the inner lining 5. In a preferred embodiment of the invention the fabric is breathing in both directions, i.e. from the inside to the outside and from the outside to the inside.

[0033] Figure 2D show the backside of the inner lining 5 when the back piece 3 is taken away. The inner layer of the inner lining 5 has a stretch part wherein the elasticity has both a horizontal and vertical operation such as indicated by the arrows in Figure 2D.

[0034] Figure 3 show a number of section in an embodiment of the invention. Figure 3A is section AA' in Figure 3. Section AA' is a section where the sleeve 7, the sleeve base 4, the back piece 3 and the inner lining 5 come together. The back piece 3 is stitched to a facing 12 of the armhole. The facing 12 provides the finishing of the armhole. Completely independent hereof, the inner lining 5 is stitched to the sleeve 7 at the level of the sleeve base 4. The inner lining 5 comprises a first part 5a and a second part 5b. This has as advantage that for the visible part 5b of the inner lining 5 another fabric may be used than for the non-visible part 5a of the inner lining 5. The first part 5a and the second part 5b are stitched to each other.

[0035] Figure 3B is section BB' in Figure 3. Section BB' is a section where the collar 9, the back piece 3 and the inner lining 5 come together. The section shows that the back piece 3 and the inner lining 5 are stitched between the collar 9 in an embodiment of the invention. This has as advantage that the inner lining has a better stretch in the height direction. Further, the embodiment of Figure 3B has a back piece inner piece 14. In alternative embodiment this back piece inner piece 14 is not present.

[0036] Figure 3C is section CC' in Figure 3. Section CC' is a section where the back piece 3, the inner lining 5 and the front piece 2 come together. Figure 3C shows

that the inner lining 5 runs completely to the seam line where the front piece 2 and the back piece 3 are connected to each other and together with the front piece 2 and the back piece 3 forms the seam line. This has once again the advantage that the inner lining has a better stretch in the height direction.

[0037] De confection techniques described above have as effect that the functional ergonomicity of the upper garment wherein these confection techniques are used improves drastically.

Claims

1. Upper garment (1) manufactured from a fabric of which the stiffness may impede the freedom of movement of the wearer, such as for example the fabric of a nurse uniform, and comprises a front piece (2), a back piece (3), two sleeve bases (4) and an inner lining (5), wherein the front piece (2) and the back piece (3) are connected to each other by seam lines in longitudinal direction and the front piece (2) is connected on each side to a sleeve base (4) by seam lines and the back piece (3) is separate from the sleeve base (4), wherein the inner lining (5) extends itself in the back piece (2) substantially continuous over the entire width between the sleeve bases (4) and is connected to the sleeve bases (4) by seam lines and is to a greater extent stretchable in comparison with the fabric of which the upper garment (1) is manufactured
characterised in that the inner lining stretches itself in the back piece (3) substantially over the entire surface between the sleeve bases (4) and up to the seam lines at the top of the upper garment and **in that** the inner lining (5) comprises a knitted or woven fabric which is stretchable both in the width and in the height direction of the upper garment.

2. Upper garment (1) according to any one of the preceding claims, **characterised in that** the inner lining (5) is not visible from the outside of the upper garment (1).

3. Upper garment (1) according to any one of the preceding claims, **characterised in that** the inner lining (5) is sewn in the back piece (3).

4. Upper garment (1) according to any one of the preceding claims, **characterised in that** the inner lining (5) comprises more than one layer.

5. Upper garment (1) according to any one of the preceding claims, **characterised in that** the inner lining (5) has an antibacterial effect.

6. Upper garment (1) according to any one of the preceding claims, wherein the knitted or woven fabric comprises a quickly drying hygroscopic material.

7. Upper garment (1) according to any one of the preceding claims, **characterised in that** the knitted or woven fabric of the inner lining comprises polyester yarn.

8. Upper garment (1) according to any one of the preceding claims, **characterised in that** the upper garment (1) corresponds with a shirt, a tunic or a vest.

9. Upper garment (1) according to any one of the preceding claims, wherein the knitted or woven fabric has a weight in the region of 80 gr/m2 to 210 gr/m2.

10. Upper garment (1) according to any one of the preceding claims, wherein the knitted or woven fabric is stretchable in the width- and height direction because of the structure of the fabric, because of a stretchable yarn in the fabric, or because of the combination of the structure and a stretchable yarn.

11. Upper garment (1) according to any one of the preceding claims, wherein the inner lining (5) is air permeable in both directions because of the structure of the fabric.

12. Upper garment (1) according to any one of the preceding claims, wherein the inner lining (5) is prefixated such that a dimensional stability of maximum 3% after industrial washing according to ISO15797 is achieved.

13. Upper garment (1) according to any one of the preceding claims, wherein the inner lining (5) comprises a first part (5a) and a second part (5b), wherein the first part (5a) is dimensioned such that it is not visible when the upper garment is worn and wherein the second part (5b) is at least partially visible when the upper garment is worn.

14. Upper garment (1) according to any one of the preceding claims, wherein the upper garment further comprises a collar (9), wherein the inner lining (5) is stitched to the collar.

15. Upper garment (1) according to any one of the preceding claims, wherein the inner lining (5) forms a seam line with the front piece (2) and the back piece (3).

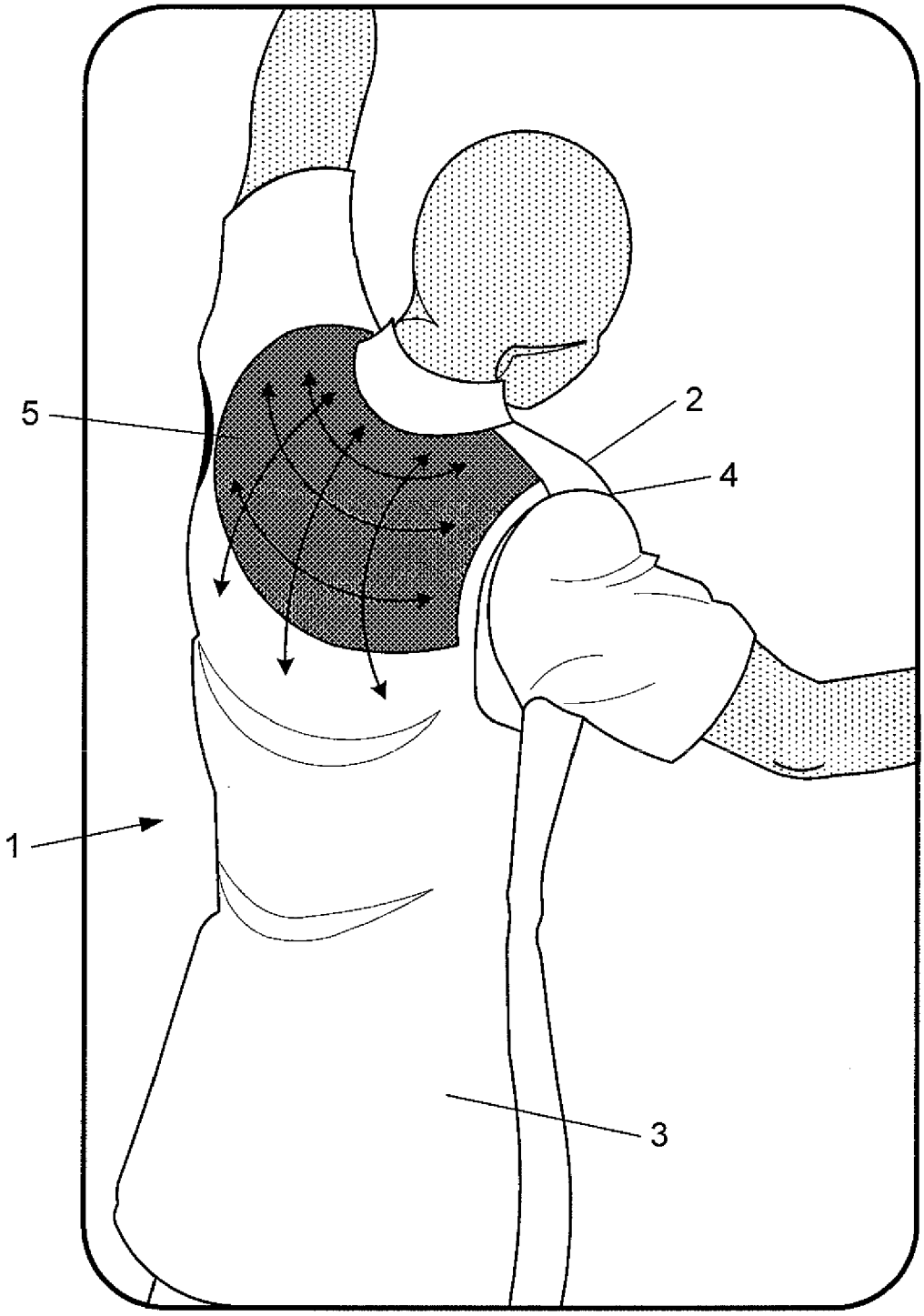

Fig. 1

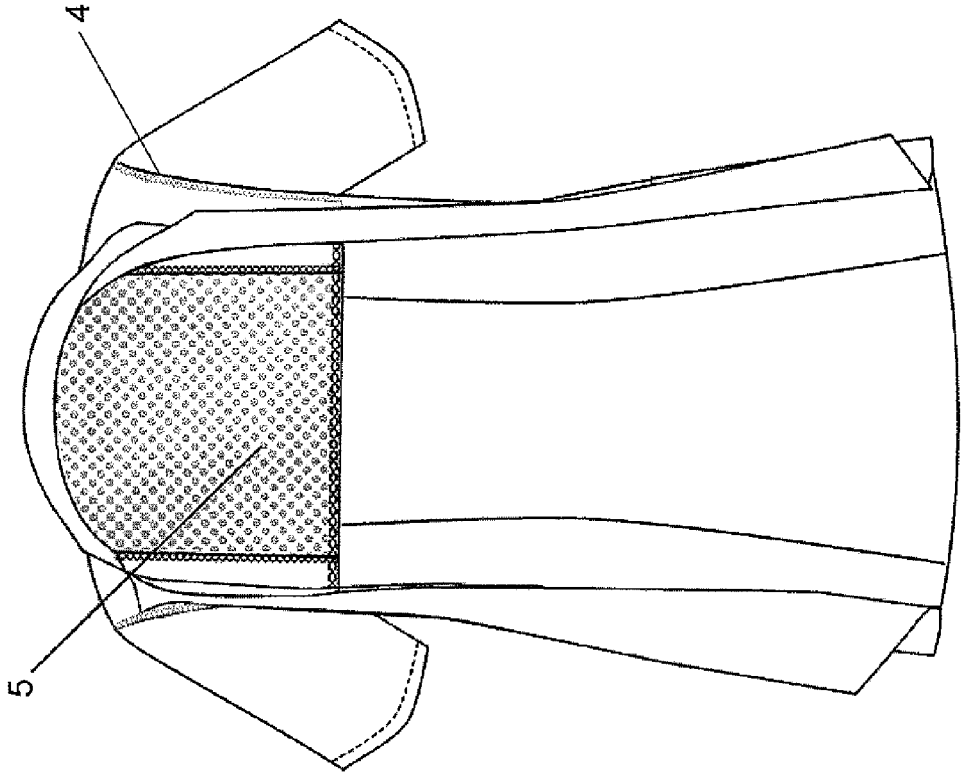

Fig. 2A

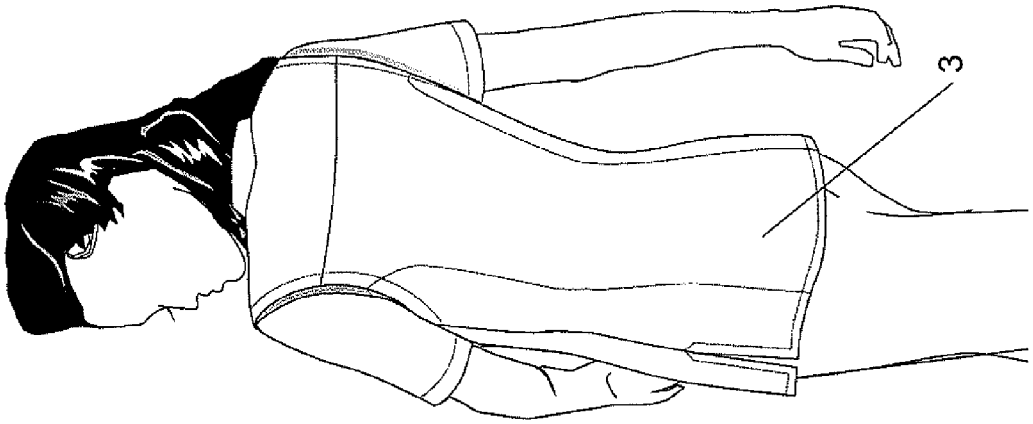

Fig. 2

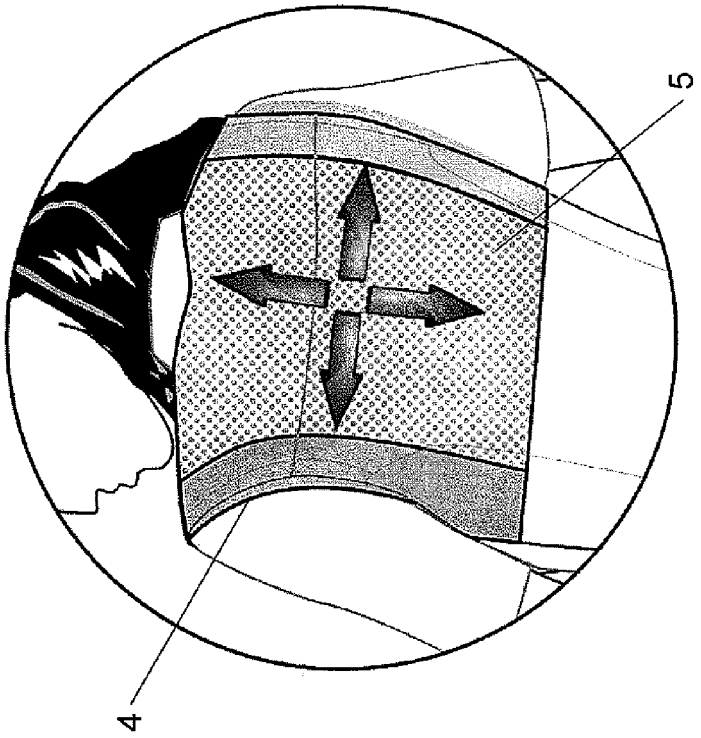

Fig. 2D

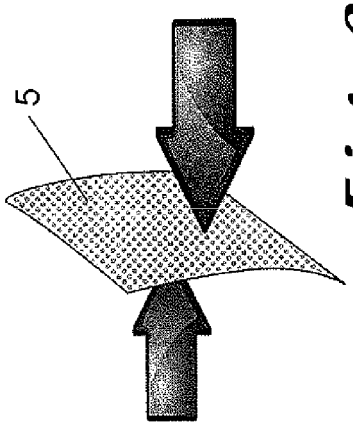

Fig. 2C

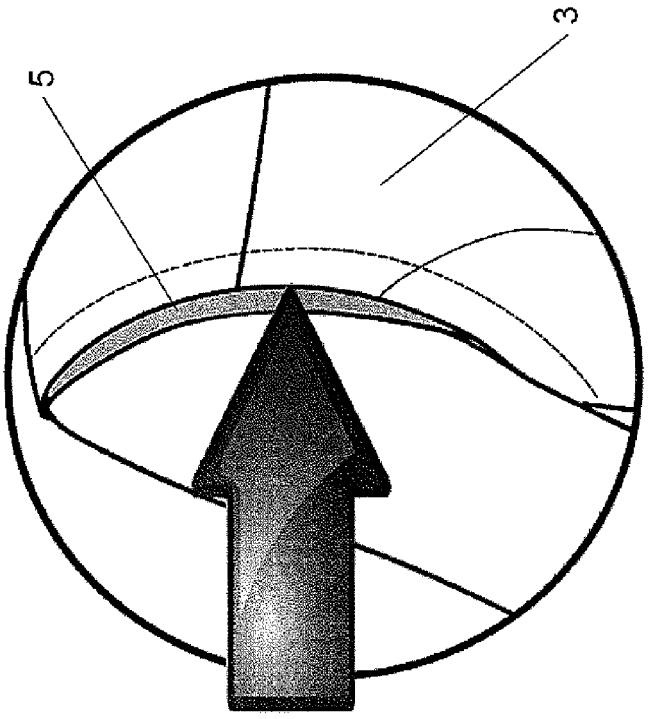

Fig. 2B

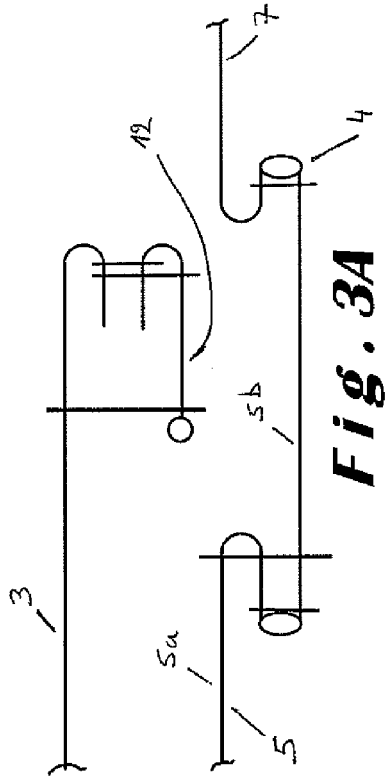

Fig. 3A

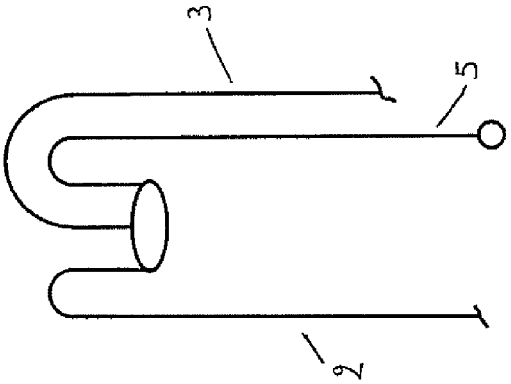

Fig. 3C

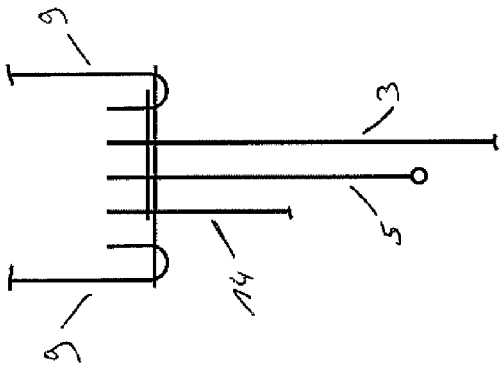

Fig. 3B

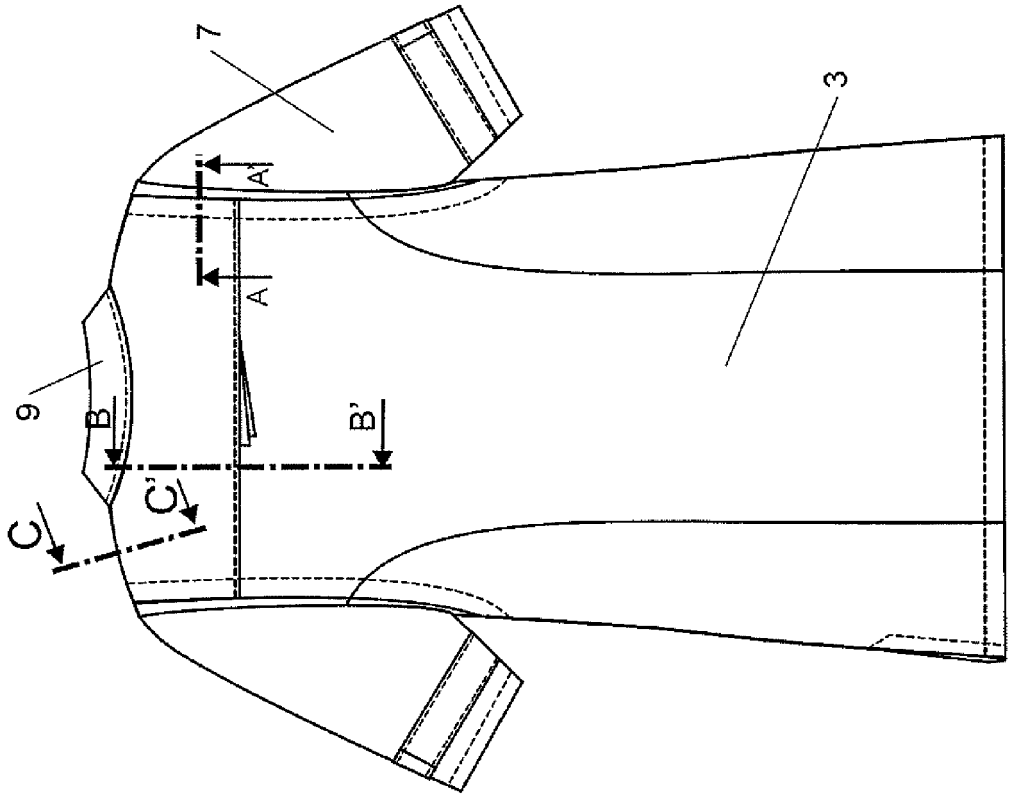

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 13 19 0971

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 1 012 301 A (MANUF DE CONFECTION DES TEXTIL) 8 July 1952 (1952-07-08) * page 2, column 1 - column 2; figures 1,2 * -----	1-12,14, 15	INV. A41D27/10
X	US 2 330 520 A (SAVETH LOUISE R) 28 September 1943 (1943-09-28) * page 1, column 2, lines 17-55; figures 2,3 * -----	1-12,14, 15	
A	US 2 194 156 A (SPEH HAZEL C) 19 March 1940 (1940-03-19) * abstract; figures 1,2 * -----	1	
A	US 3 153 793 A (LEPORE PATSY R) 27 October 1964 (1964-10-27) * abstract; figures 2-4 * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC) A41D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 January 2014	Monné, Eric

CATEGORY OF CITED DOCUMENTS

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14-01-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2330520 A	28-09-1943	NONE	
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US 3153793 A	27-10-1964	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

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