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**(54) REUSABLE PANTS FOR RETENTION OF FLUIDS**

WIEDERVERWENDBARE HOSE ZUM ZURÜCKHALTEN VON FLÜSSIGKEITEN

PANTALON RÉUTILISABLE POUR LA RÉTENTION DE FLUIDES

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- **DEJKE, Valter**  
**S-436 55 Hovås (SE)**
- **BERNSTAD, Mårten**  
**S-218 51 Klagshamn (SE)**

(30) Priority: **02.07.2011 SE 1130063**

(74) Representative: **Awapatent AB**  
**P.O. Box 5117**  
**200 71 Malmö (SE)**

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(73) Proprietor: **Pjama AB**  
**218 53 Klagshamn (SE)**

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(72) Inventors:  
• **GÄRDENFORS, Torbjörn**  
**S-218 53 Klagshamn (SE)**

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## Description

### Field of the invention

**[0001]** The present innovation relates to pants which are able to absorb and contain liquids, e.g. urine, without leakage, their production and use.

### Background

**[0002]** A child is in many countries considered to be enuretic if the child wets the bed at ages above four years. Enuresis can sometimes last into adulthood. Incontinence in adults appears in forms where the person can relearn to keep from wetting the bed and in forms where this is not possible.

**[0003]** The view of the medical profession is that wearing diapers is unsuited for enuretic children or incontinent persons who can relearn to keep from wetting the bed, both from a medical and psychological perspective. Also, some incontinent persons who cannot relearn to keep from wetting the bed feel that having to wear diapers is degrading.

**[0004]** There exists no pants specifically adapted to children who are enuretic or undergoing toilet training, nor for incontinent adults, which can handle the problem of uncontrolled or involuntary discharge of urine in a way which is comfortable and discrete, giving the appearance and sensation of ordinary pajama pants, and at the same time also are safe from leakage. Nor does there exist any pants which can handle the problem of controlled discharge of urine in an extreme environment or during extreme conditions, where this is needed, which is comfortable and discrete, giving the appearance and sensation of ordinary pants, and at the same time also are safe from leakage.

**[0005]** US patent no. 6,487,727 concerns nightwear for children or incontinent persons, However, this invention does neither have a specific absorbent inner layer to achieve maximum absorption, nor is the inner layer only joined to the outer and middle layer at the cuffs and optionally at discrete dots or lines, to achieve maximum absorption and comfort, nor has it got functionally designed hydrofobe cuffs which, fastened together with the pajama textile in a capillary breaking way envelope the endings at the waist and ankles. Testing has shown that assuring comfort and safety from leakage at the waist and ankles are two main challenges when developing a garment of this type, which the cited patent does not cover.

**[0006]** U.S. patent no. 3,648,699 concerns a garment for an incontinent person or for a bedridden patient, consisting of an outer garment in the form of short trousers, inside which there is inserted a removable impermeable lining in the form of underpants covered with an absorbent material on the user side, with a configuration similar to that of the short trousers.

**[0007]** U.S. patent no. 2,621,336 concerns a night garment of the sleepsuit type, in two parts. An external part,

made from a heat-retaining material, such as a cover, and a removable internal part consisting of a plastic lining preventing soiling of the bedding. This garment is an overpajama intended for very young children.

**[0008]** U.S. patent no. 3,180,336 concerns a pajama for children consisting of trousers inside which a piece in the form of pants produced from plastics material is fixed to the waist but not to the crotch of the trousers, so as to enable the child wearing them to move its legs freely. This garment is provided with elastic at the waist and at the ankles in order to ensure comfort and warmth for the child. This garment can also cover the diapers worn by very young children.

**[0009]** CA patent no. 1,000,001 concerns a multilayer garment for incontinent persons or mainly for hospitalized patients, which opens and closes by means of attachment cords.

**[0010]** FR 2,786,992 concerns discloses a garment in the form of disposable or re-usable pyjama trousers made from an inner layer (3) of a permeable material such as flannel, sponge or jersey knit and an outer impermeable layer (2), or from a single permeable layer with an outer impermeable coating of a supple polymer film.

**[0011]** There is still a need for new garments that hinders leakage of fluids in an efficient manner and which garments are easy to put on or take off and comfortable and discrete for the wearer.

### Summary of the invention

**[0012]** Although designed to hinder leakage of urine into the bed, none of the documents disclosed above gives the appearance and sensation of being an ordinary pair of pajama pants, nor do they have integrated hydrophobic cuffs at waist and ankles, assuring urine not escaping the pajama pants into the bed.

**[0013]** To solve the problems discussed above, a pair of reusable pants is devised, giving the appearance and sensation of e.g. a pair of ordinary pajama pants, for comfortable, safe and discrete handling of the problem of controlled, uncontrolled or involuntary discharge of urine. The article is reusable, absorbent and fully integrated comprising no attachable or detachable parts. The article comprises a three layer textile with an inner absorbent layer coming into contact with the skin of the wearer, a middle impermeable layer and a permeable outer layer, joined to elastic cuffs at the waist and ankles that can be hydrofobic. The cuffs that can be hydrofobic, together with the three layered textile, envelope the endings. At the waist and ankles, a ribbon made of elastic or non-elastic material enhances the enveloping effect of the cuffs.

The outer and middle layers of the textile are laminated together. The inner absorbent or superabsorbent layer is attached to the laminated inner and middle layers only at the cuffs at the waist and ankles and optionally at discrete lines and dots. Extra absorbent material at waist

and ankles and a baggy design at the ankles is optionally applied at manufacturing to handle large amount of liquid. The pants according to the present invention is preferably used as a sleeping garment.

**[0014]** In one embodiment the present invention relates to a pair of fully integrated, washable and reusable pants capable of absorbing liquids, said pants comprising:

A) a sheeted textile comprising an inner absorbent layer (1) coming into contact with the skin of the wearer, and a laminated textile (23) comprising a middle impermeable layer (2) and a permeable outer layer (3), and

B) elastic and hydrophobic cuffs (6) for keeping liquid inside the pants when wet,

are joined together at the waist and ankles, wherein outer laminated textile (23) is of a larger size compared to the inner absorbent layer (1) thus allowing a formation of pockets for excessive fluid retention.

Optionally the inner absorbent layer (1) is made of a super absorbent material.

**[0015]** In another embodiment the present invention relates to a pair of fully integrated, washable and reusable pants capable of absorbing liquids, said pants comprising:

A) a sheeted textile comprising an inner absorbent layer (1) coming into contact with the skin of the wearer, and a laminated textile (23) comprising a middle impermeable layer (2) and a permeable outer layer (3), and

B) elastic and hydrophobic cuffs (6) for keeping liquid inside the pants when wet, are joined together at the waist and ankles, wherein at least at the waist said sheeted textile and cuff (6) is attached using stitches/weld lines/glue lines (14), providing an upper seam (14a), a middle seam (14b) and a lower seam (14c), wherein the lower seam (14c) attach the inner layer (1) to the cuff (6), the middle seam (14b) attach one layer of the laminated material (23) to the cuff (6) with the middle layer (3) of the laminated material being in direct contact with the cuff (6), and the upper seam (14a) attach one or two layers of the laminated material (23) to the cuff (6) with the middle layer (3) of the laminated material being in direct contact with the cuff (6), said laminated material (23) being folded in an s-like shape for only the impermeable middle layer (2) of the laminated material to be in contact with liquid inside the pants.

**[0016]** Also, the present invention relates to a method for producing a pair of fully integrated, washable and reusable pants capable of absorbing liquids, comprising the steps of:

a. laminate outer permeable layer (3) to middle im-

permeable layer (2);

b. cut a sheet of laminated textile (23) and a sheet of absorbent or superabsorbent material (1) into a desired shape, and place the laminated textile (23) on the absorbent material (1), wherein the middle layer (2) is in contact with the absorbent material (1);

c. make seams at front and rear, and the inner seams of both surface and lining;

d. optionally tape or laminate the seams to make them watertight;

e. prepare the cuffs (6);

f. attaching the outer part of the pant, the laminated textile (23), at the waist cuff;

g. prepare the waistband, and put it in the cuff (6);

h. attach the cuff (6) to the inner layer (1) of the pants;

i. attach the cuffs (6) at the ankles or attach a super permeable material (7) to the inner layer (1) close to the ankles and attach the super permeable material (7) to the cuffs (6) and attach the laminated material (23) to the cuffs (6), wherein the outer layer (3) is in contact with the cuff (6) at the seam.

**[0017]** The present invention also relates to the use of the pants as sleeping garment.

#### Short description of the drawings

**[0018]** The pants of the present invention will now be described, by way of example, with reference to the attached drawings.

Fig 1 a is a side view of the inner, middle and outer layers comprising the textile.

Fig 1 b is a side view of the inner, middle and outer layers comprising the textile, where the inner layer has been joined to the middle and outer layer at discrete dots or lines through welding or gluing.

Fig 2 is a side view of how the inner, middle and outer layers attach to the cuffs at waist and ankles.

Fig 3 is a side view of an optional strip of extra absorbent material at the waist and also how the optional extra absorbent material is attached at the waist.

Fig 4 is a front view of extra absorbent material in the form of a sheet is fastened between the inner absorbent layer and the laminated middle and outer layers.

Fig 5 is a front view of extra absorbent material in the form of shorts is fastened between the inner absorbent layer and the laminated middle and outer layers.

Fig 6 is a front view of the pajama.

Fig 7 is a side view of the ankle area where a super permeable textile is fastened to the inner absorbent textile a few centimeters above the cuffs.

Fig 8 is a side view of the cuff area at waist and optionally ankles during manufacture of the pants, wherein laminated material is folded after stitching

and taping.

Fig 9 a side view of how the inner, middle and outer layers attach to the cuffs at waist and ankles, including a tape attached in the area forming the pocket for excessive fluid retention.

#### Detailed description of the invention

**[0019]** An issue of enuresis is the psychological impact on the person affected. Thus garments that do not visually differ from ordinary garments but are able to absorb fluids in large quantities are desirable. By making garments that are able to absorb large quantities of fluids but also are soft, comfortable and discrete, i.e. not visually different from other ordinary garments, a wearer may be able to feel secure and self-confident since a spectator will not be able to tell the difference between garments adapted for enuresis and ordinary garments.

**[0020]** Referring to figures 1 to 9, the complete pants legs, crutch and bottom area (13) comprise a three layered textile sheeted construction with a permeable outer layer (3), an impermeable middle layer (2) and an absorbent inner layer (1) facing the skin (4) of a wearer. The inner layer is comfortable for the wearer and assures maximum absorption of liquid, the middle layer assures the liquid does not leak through the pants and the outer layer assures the appearance of a pair of e.g. ordinary pajama pants. The outer and middle layers are laminated together forming the laminated material (23) and the inner absorbent layer (1) is joined to the laminated material (23) at the middle impermeable layer side at the waist and ankles and optionally at discrete dots or lines at other places (5), through gluing, welding or stitching. If stitching is used as means of joining the sheeted layers, waterproofing of the stitches through taping or any other technique for waterproofing stitching will be used. The partitioning of the textile into the inner absorbent layer and the laminated outer and middle layer allows the inner absorbent material to absorb fluid more effectively than would have been the case if the inner material was laminated to the laminated outer and middle layer, and allowing for the elastic and bendable appearance, sensation and fit of a pair of ordinary pajama pants. The optional discrete joining of the inner layer to the middle and outer layers at discrete dots and/or lines allows for maximum absorption at the same time as a comfortable fit is assured through the alignment of the layers.

**[0021]** At the waist (11) and ankles (12) hydrophobic elastic cuffs (6) are attached to the three layered textile and extend below where they are visible at the waistline (see Fig 2, 3, 9) and above the line where they are visible at the ankles (Fig 7). The inner absorbent layer and the laminated outer and middle layer are fastened to the cuff in accordance with Fig 2, 3 or 9, where the fastening of the materials with stitches/weld lines/glue lines (14) assures a capillary breaking design. As exemplified in Fig 9, the upper seam (14a) of the stitches/weld lines/glue lines (14) of the cuff, especially when it relates to stitches,

may be applied with a tape (15), e.g. made of polyurethane, to ensure no leakage through the seam (see Fig 9, the dotted line). In Fig 9, the stitches/weld lines/glue lines (14), provide an upper seam (14a), a middle seam (14b) and a lower seam (14c), wherein the lower seam (14c) attaches the inner layer (1) to the cuff (6), the middle seam (14b) attaches one layer of the laminated material (23) to the cuff (6) with the middle layer (2) of the laminated material is in direct contact with the cuff (6), and the upper seam (14a) attaches one or two layers of the laminated material (23) to the cuff (6) with the middle layer (2) of the laminated material is in direct contact with the cuff (6). The laminated material (23) is folded in an s-like shape in order to make sure that only the impermeable middle layer (2) of the laminated material is in contact with any fluid inside the pants. The absorbent layer transports excessive amounts of liquid to the envelope or pocket (16) formed by the impermeable middle layer (2) of the laminated material (23) and the hydrophobic cuff (6). This folding and fastening construction in combination with the absorbent layer assures that urine is kept from leaking into the bed. The same applies for the embodiments in Fig 2 and 3.

**[0022]** Depending on the age of the person, different amounts of urine will be excreted. For handling large amounts of urine, extra absorbent material (8) may be at manufacturing of the pajama pants permanently attached to the inner absorbent layer (1) where it in turn is attached to the hydrophobic cuffs (6). For handling even larger amounts of excreted urine at higher ages, a sheet (9) or an inner pair of shorts (10) of absorbent material may be permanently fastened to the absorbent layer in the same way as in Fig 3 at manufacturing.

**[0023]** For stopping large amounts of urine to pass at the ankles, the laminated middle and outer material optionally form a bag (17) together with the cuffs, where excessive urine is collected. A super permeable textile (7) is fastened to the inner absorbent textile a few centimeters above the cuffs, making sure the foot is guided to pass through the cuff when putting on the pajama and at the same time allowing urine to pass from the legs and down into the bag (17) formed by the laminated textile and the cuff (Fig 7). The fastening of the laminated textile to the cuff is done in the same capillary breaking way as in Fig 2. The permeable textile is fastened to the part of the hydrophobic cuff not facing the skin in accordance with Fig 7. For enhancing the containing ability of the cuffs at waist and ankles, a ribbon made of elastic or non-elastic material enhances the enveloping effect of the cuffs.

**[0024]** The whole inner part of the pants in contact with the wearer made of the absorbent inner layer (1) may be completely made of super absorbent textile. Super absorbent textiles are materials that absorb water or saline solution many times their own weight. Super absorbent textiles absorb and retain fluids in an amount of at least 10-45 times their own weight. Preferably super absorbent textiles absorb at least 70 or 80 times their own weight

of water, at least 40 or 45 times of normal saline solution. As an example of super absorbent materials BELL OASIS® may be mentioned.

**[0025]** For discrete handling the pants according to the present invention which have been subjected to fluids, a waterproof pocket suitable for containing the entire pants may be attached to the outside of said pants. So that when fluids have been absorbed into the pants and the wearer wants to remove them and store them discretely, e.g. until the wearer gets home or until the pants may be washed, so that a spectator seeing the bundle or bag would not react to a large extent. Pants containing absorbed fluids may be folded or pushed into the waterproof pocket without leakage of any fluids from the pants. The water pocket must be large enough to contain the entire pants and be placed on the outside of the pants.

**[0026]** A method of production may be described as follows:

- a. laminating outer permeable layer (1) to middle impermeable layer (2);
- b. lay sheet of laminated textile (23) on sheet of absorbent material (1) and cut;
- c. sew seams at front and rear, and the inner seams of both surface and lining;
- d. tape or laminate the seams to make them watertight;
- e. sew the cuffs (6);
- f. sew the outer pant at the waist cuff in accordance with Fig 2;
- h. sew the waistband and put it in the cuff (6);
- h. sew the cuff (6) to the inner trousers ;
- i. sew the cuffs (6) at the ankles in accordance with Fig 2.

**[0027]** One embodiment of the method of production will now be described by the following steps:

- a. laminate outer permeable layer (3) to middle impermeable layer (2);
- b. cut a sheet of laminated textile (23) and a sheet of absorbent material (1) into a desired shape, and place the laminated textile (23) on the absorbent material (1), wherein the middle layer (2) is in contact with the absorbent material (1);
- c. make seams at front and rear, and the inner seams of both surface and lining, e.g. by sewing;
- d. optionally tape or laminate the seams to make them watertight;
- e. prepare the cuffs (6), e.g. by sewing;
- f. attaching the outer part of the pant at the waist cuff by first attaching the middle seam (14b) to connect the cuff (6) with laminated material (23), wherein the middle layer (2) is in contact with the cuff (6), then the laminated material is folded over the middle seam (14b) and an upper seam (14a) is made at a distance from seam (14 b) through one or two layers of the laminated material (23) to connect it to the cuff

(6), wherein the outer layer (3) is in contact with the cuff (6) in accordance with Fig 2, 3 or 9;

g. prepare the waistband, e.g. by sewing, and put it in the cuff (6);

5 h. attach the cuff (6) to the inner layer (1) of the pants by lower seam (14c), e.g. by sewing;

i. attach the cuffs (6) at the ankles as disclosed above under 6 or attach a super permeable material (7) to the inner layer (1) close to the ankles and attach the super permeable material (7) to the cuffs (6) and attach the laminated material (23) to the cuffs (6), wherein the outer layer (3) is in contact with the cuff (6) at the seam, e.g. by sewing.

#### 15 Features of the invention

**[0028]** A pair of fully integrated, washable, reusable, discrete and comfortable pants for containing liquids, e. g. urine, the pair of pants comprising: A) a sheeted textile comprising an inner absorbent layer coming into contact with the skin of the wearer, a middle impermeable layer and a permeable outer layer, joined together in a way which gives the appearance and sensation of an ordinary, loose textile, with B) elastic and hydrophobic cuffs, giving the appearance of ordinary cuffs and keeping the liquid inside the pants when wet, being one integrated garment without loose parts and giving the appearance of a pair of ordinary pajama pants.

**[0029]** The pair of pants, where the inner absorbent layer is a super absorbent material.

**[0030]** The pair of pants, where the legs of the pajama are of full length, for the absorbing inner material to extend from waist to ankle, allowing for maximum absorbing surface.

**[0031]** The pair of pants, where the inner absorbent layer is joined to the laminated middle impermeable layer and the outer permeable layer only at the waist and the ankles and optionally also joined at discrete dots or lines through welding or gluing, allowing for the inner absorbent material to absorb fluid more effectively than would have been the case if the inner material was laminated to the laminated outer and middle layer, and allowing for the elastic and bendable appearance, sensation and fit of a pair of e.g. a pair of ordinary pajama pants.

**[0032]** A pair of pants with elastic cuffs made of a hydrophobic, elastic material, which are attached to the end of the sheeted textile at waist and ankles and which extend below where they are visible at the waistline and above the line where they are visible at the ankles thus forming an envelope of the impermeable middle layer and the hydrophobic cuff, where excessive amounts of e.g. urine can be collected and kept from leaking into the bed.

**[0033]** The pair of pants, where the inner absorbent layer and the laminated outer and middle layer are fastened to the cuffs at waist and ankles, where the fastening of the materials assures a capillary breaking design.

**[0034]** The pair of pants, where extra absorbent mate-

rial is attached to the sheeted textile where it in turn is attached to the hydrophobic cuffs.

**[0035]** The pair of pants, where a sheet of extra absorbent material is attached to the inside of the pants, between the inner absorbent layer and the laminated middle impermeable layer and outer layer.

**[0036]** The pair of pants, where extra absorbent material is forming an inner pair of shorts attached to the inside of the pants, between the inner absorbent layer and the laminated middle impermeable layer and outer layer.

**[0037]** The pair of pants, where a super permeable textile is fastened to the inner absorbent textile a few centimeters above the cuffs, making sure the foot is guided to pass through the cuff when putting on the pants and at the same time allowing e.g. urine to pass from the legs and down into the bag formed by the laminated textile and the cuff. The fastening of the laminated textile to the cuff assures a capillary breaking design. The super permeable textile is fastened to the part of the hydrophobic cuff not facing the skin.

**[0038]** The pair of pants, where at the waist and ankles a ribbon made of elastic or non elastic material enhances the enveloping effect of the cuffs.

#### Claims

1. A pair of fully integrated, washable and reusable pants capable of absorbing liquids, said pants comprising:

A) a sheeted textile comprising an inner absorbent layer (1) coming into contact with the skin of the wearer, and a laminated textile (23) comprising a middle impermeable layer (2) and a permeable outer layer (3), and

B) elastic and hydrophobic cuffs (6) for keeping liquid inside the pants when wet,

are joined together at the waist and ankles, wherein outer laminated textile (23) is of a larger size compared to the inner absorbent layer (1) thus allowing a formation of pockets for excessive fluid retention, wherein at least at the waist said sheeted textile and cuff (6) is attached using stitches/weld lines/glue lines (14), providing an upper seam (14a), a middle seam (14b) and a lower seam (14c), wherein the lower seam (14c) attach the inner layer (1) to the cuff (6), the middle seam (14b) attach one layer of the laminated material (23) to the cuff (6) with the middle layer (2) of the laminated material being in direct contact with the cuff (6), and the upper seam (14a) attach one or two layers of the laminated material (23) to the cuff (6) with the middle layer (2) of the laminated material being in direct contact with the cuff (6), said laminated material (23) being folded in an s-like shape for only the impermeable middle layer (2) of the laminated material to be in contact with liquid

inside the pants.

2. The pair of pants according to claim 1, wherein the inner absorbent layer (1) is made of a super absorbent material.

3. The pair of pants according to claim 1 or 2, where the legs of the pants are of full length, for the absorbing inner material to extend from waist to ankle.

4. The pair of pants according to any one of the claims 1-3, where the inner absorbent layer (1) is joined to the laminated middle impermeable layer (2) and the outer permeable layer (3) joined at further points dots or lines (5) through welding, gluing or sewing.

5. The pair of pants according to any one of the claims 1 to 4, which are attached to the end of the sheeted textile at waist and ankles and which extend below where they are visible at the waistline and above the line where they are visible at the ankles thus forming an envelope of the impermeable middle layer and the hydrophobic cuff, where excessive amounts of liquid can be collected and kept from leaking.

6. The pair of pants according to any one of the claims 1 to 5, where extra absorbent material (8) is attached to the sheeted textile where it in turn is attached to the hydrophobic cuffs (6).

7. The pair of pants according to according to any one of the claims 1 to 6, where a sheet (9) of extra absorbent material is attached to the inside of the pants, between the inner absorbent layer (1) and the laminated middle impermeable layer (2) and outer layer (3).

8. The pair of pants according to any one of the claims 1 to 7, where extra absorbent material is forming an inner pair of shorts (10) attached to the inside of the pants, between the inner absorbent layer (1) and the laminated middle impermeable layer (2) and outer layer (3).

9. The pair of pants according to any one of the claims 1 to 8, where a super permeable textile (7) is fastened to the inner absorbent layer (1) 1 to 5 centimeters above the cuffs, allowing any liquid present in the pants to pass from the legs and down into a bag (16) formed by the laminated textile and the cuff (6), the super permeable textile (7) is fastened to the part of the hydrophobic cuff (6) not facing the skin and the laminated textile is fastened to the cuff (6), preferably by stitching, wherein the permeable the cuff (6) is adjacent the permeable outer layer (3) at the attachment.

10. The pair of pants according to any one of the claims

1 to 9, where at the waist and ankles a ribbon made of elastic or non-elastic material enhances the enveloping effect of the cuffs.

11. A method for producing a pair of fully integrated, washable and reusable pants capable of absorbing liquids according to anyone of claims 1-10, comprising the steps of:

- a. laminate outer permeable layer (3) to middle impermeable layer (2);
- b. cut a sheet of laminated textile (23) and a sheet of absorbent material (1) into a desired shape, and place the laminated textile (23) on the absorbent material (1), wherein the middle layer (2) is in contact with the absorbent material (1);
- c. make seams at front and rear, and the inner seams of both surface and lining;
- d. optionally tape or laminate the seams to make them watertight;
- e. prepare the cuffs (6);
- f. attaching the outer part of the pant, the laminated textile (23), at the waist cuff;
- g. prepare the waistband, and put it in the cuff (6);
- h. attach the cuff (6) to the inner layer (1) of the pants;
- i. attach the cuffs (6) at the ankles or attach a super permeable material (7) to the inner layer (1) close to the ankles and attach the super permeable material (7) to the cuffs (6) and attach the laminated material (23) to the cuffs (6), wherein the outer layer (3) is in contact with the cuff (6) at the seam.

12. Use of the pants according to any one of claims 1 to 10 as sleeping garment.

### Patentansprüche

1. Voll integrierte, waschbare und wiederverwendbare Hose, die Flüssigkeit absorbieren kann, wobei die Hose umfasst:

- A) eine Bahntextilie, die eine innere absorbierende Schicht (1) umfasst, die in Kontakt mit der Haut des Trägers tritt, und eine laminierte Textilie (23), die eine mittlere undurchlässige Schicht (2) und eine durchlässige äußere Schicht (3) umfasst, und
- B) elastische und hydrophobe Manschetten (6) zum Zurückhalten von Flüssigkeit im Inneren der Hose bei Nässe, die an der Hüfte und den Knöcheln aneinander gefügt sind, wobei die äußere laminierte Textilie (23) eine größere Größe als die innere absorbierende Schicht (1) auf-

weist, weshalb eine Bildung von Taschen für eine übermäßige Fluideinlagerung ermöglicht wird,

wobei mindestens an der Hüfte die Bahntextilie und Manschette (6) unter Verwendung von Nähten/Fließnähten/Klebnähten (14) befestigt ist, wodurch eine obere Naht (14a), eine mittlere Naht (14b) und eine untere Naht (14c) bereitgestellt werden, wobei die untere Naht (14c) die innere Schicht (1) an der Manschette (6) befestigt, die mittlere Naht (14b) eine Schicht des laminierten Materials (23) an der Manschette (6) befestigt, wobei die mittlere Schicht (2) des laminierten Materials in direktem Kontakt mit der Manschette (6) ist und die obere Naht (14a) eine oder zwei Schichten des laminierten Materials (23) an der Manschette (6) befestigt, wobei die mittlere Schicht (2) des laminierten Materials in direktem Kontakt mit der Manschette (6) ist, wobei das laminierte Material (23) zu einer s-artigen Form gefaltet ist, sodass nur die undurchlässige mittlere Schicht (2) des laminierten Materials mit der Flüssigkeit innerhalb der Hose in Kontakt ist.

2. Hose nach Anspruch 1, wobei die innere absorbierende Schicht (1) aus einem superabsorbierenden Material hergestellt ist.

3. Hose nach Anspruch 1 oder 2, wobei die Beine der Hose von voller Länge sind, damit sich das absorbierende Innenmaterial von der Hüfte bis zum Knöchel erstreckt.

4. Hose nach einem der Ansprüche 1 bis 3, wobei die innere absorbierende Schicht (1) mit der laminierten mittleren undurchlässigen Schicht (2) zusammengefügt ist und die äußere durchlässige Schicht (3) an weiteren Punkten oder Linien (5) durch Fließnähen, Kleben oder Nähen zusammengefügt ist.

5. Hose nach einem der Ansprüche 1 bis 4, die am Ende der Bahntextilie an Hüfte und Knöcheln befestigt ist und die sich darunter erstreckt, wobei sie auf Hüftlinie und oberhalb der Linie sichtbar ist und wobei sie an den Knöcheln sichtbar ist und so eine Hülle aus der undurchlässigen mittleren Schicht und der hydrophoben Manschette bildet, in der übermäßige Mengen von Flüssigkeit gesammelt und am Austreten gehindert werden können.

6. Hose nach einem der Ansprüche 1 bis 5, wobei ein extra absorbierendes Material (8) an der Bahntextilie befestigt ist, wo es wiederum an den hydrophoben Manschetten (6) befestigt ist.

7. Hose nach einem der Ansprüche 1 bis 6, wobei eine Bahn (9) aus extra absorbierendem Material an der Innenseite der Hose befestigt ist, zwischen der in-

- neren absorbierenden Schicht (1) und der laminierten mittleren undurchlässigen Schicht (2) und äußeren Schicht (3).
8. Hose nach einem der Ansprüche 1 bis 7, wobei extra absorbierendes Material eine innere kurze Hose (10) bildet, die an der Innenseite der Hose befestigt ist, zwischen der inneren absorbierenden Schicht (1) und der laminierten mittleren undurchlässigen Schicht (2) und äußeren Schicht (3). 5  
10
9. Hose nach einem der Ansprüche 1 bis 8, wobei eine superdurchlässige Textilie (7) an der inneren absorbierenden Schicht (1) 1 bis 5 Zentimeter über der Manschette befestigt ist, wodurch Flüssigkeit, die in der Hose vorhanden ist, von den Beinen und nach unten in einen Beutel (16) laufen kann, der durch die laminierte Textilie und die Manschette (6) gebildet wird, wobei die superdurchlässige Textilie (7) an dem Teil der hydrophoben Manschette (6) befestigt ist, der nicht zur Haut weist, und die laminierte Textilie an der Manschette (6) befestigt ist, vorzugsweise durch Nähen, wobei die durchlässige Manschette (6) benachbart der durchlässigen äußeren Schicht (3) an der Befestigung ist. 15  
20  
25
10. Hose nach einem der Ansprüche 1 bis 9, wobei an der Hüfte und den Knöcheln ein Band aus elastischem oder nicht elastischem Material die Umhüllungswirkung der Manschetten verbessert. 30
11. Verfahren zur Herstellung einer voll integrierten, waschbaren und wiederverwendbaren Hose, die Flüssigkeit absorbieren kann, nach einem der Ansprüche 1 bis 10, umfassend die Schritte: 35
- Laminieren der äußeren durchlässigen Schicht (3) an die mittlere undurchlässige Schicht (2);
  - Schneiden einer Bahn einer laminierten Textilie (23) und einer Bahn aus absorbierendem Material (1) zu einer gewünschten Form und Anordnen der laminierten Textilie (23) auf dem absorbierenden Material (1), wobei die mittlere Schicht (2) in Kontakt mit dem absorbierenden Material (1) ist; 40
  - Herstellen von Nähten an der Vorder- und Rückseite und der inneren Nähte sowohl der Oberfläche als auch Fütterung;
  - wahlweise Tapen oder Laminieren der Nähte, um diese wasserdicht zu machen; 50
  - Vorbereiten der Manschetten (6);
  - Befestigen des äußeren Teils der Hose, der laminierten Textilie (23), an der Hüftmanschette;
  - Herstellen des Bunds und Einfügen davon in die Manschette (6); 55
  - Befestigen der Manschette (6) an der inneren Schicht (1) der Hose;

i. Befestigen der Manschetten (6) an den Knöcheln oder Befestigen eines superdurchlässigen Materials (7) an der inneren Schicht (1) nahe der Knöchel und Befestigen des superdurchlässigen Materials (7) an den Manschetten (6) und Befestigen des laminierten Materials (23) an den Manschetten (6), wobei die äußere Schicht (3) in Kontakt mit der Manschette (6) an der Naht ist.

12. Verwendung der Hose nach einem der Ansprüche 1 bis 10 als Nachtwäsche.

## 15 Revendications

1. Pantalon entièrement intégré, lavable et réutilisable capable d'absorber des liquides, ledit pantalon comprenant :

A) un textile formé de couches comprenant une couche absorbante interne (1) entrant en contact avec la peau de l'utilisateur, et un textile stratifié (23) comprenant une couche imperméable intermédiaire (2) et une couche perméable externe (3), et

B) des manchons élastiques et hydrophobes (6) pour maintenir le liquide à l'intérieur du pantalon quand celui-ci est mouillé ;

sont réunis les uns aux autres au niveau de la taille et des chevilles, le textile stratifié externe (23) ayant une taille supérieure à celle de la couche absorbante interne (1), en permettant ainsi la formation de poches pour la rétention des liquides excédentaires, dans lequel, au moins au niveau de la taille, ledit textile formé de couches et lesdits manchons (6) sont fixés en utilisant des piqûres/lignes de soudure/lignes de collage (14), en formant un joint supérieur (14a), un joint intermédiaire (14b) et un joint inférieur (14c), le joint inférieur (14c) fixant la couche interne (1) au manchon (6), le joint intermédiaire (14b) fixant une couche du matériau stratifié (23) au manchon (6), la couche intermédiaire (2) du matériau stratifié étant en contact direct avec le manchon (6), et le joint supérieur (14a) fixant une ou deux couches du matériau stratifié (23) au manchon (6), la couche intermédiaire (2) du matériau stratifié étant en contact direct avec le manchon (6), ledit matériau stratifié (23) étant plié en forme de S pour que seule la couche imperméable intermédiaire (2) du matériau stratifié soit en contact avec le liquide à l'intérieur du pantalon.

2. Pantalon selon la revendication 1, dans lequel la couche absorbante interne (1) se compose d'un matériau superabsorbant.

3. Pantalon selon la revendication 1 ou 2, dans lequel les jambes du pantalon sont longues, pour que le matériau absorbant interne s'étende de la taille aux chevilles.
4. Pantalon selon l'une quelconque des revendications 1 à 3, dans lequel la couche absorbante interne (1) est jointe à la couche imperméable intermédiaire stratifiée (2) et la couche perméable externe (3) jointe au niveau de points de couture, de colle ou de lignes supplémentaires (5) par soudure, collage ou couture.
5. Pantalon selon l'une quelconque des revendications 1 à 4, fixé à l'extrémité du textile formé de couches au niveau de la taille et des chevilles et s'étendant en dessous de la limite de visibilité au niveau de la taille et au-dessus de la ligne marquant la limite de visibilité aux chevilles, en formant ainsi une enveloppe constituée de la couche imperméable intermédiaire et des manchons hydrophobes, dans laquelle des quantités excédentaires de liquide peuvent être collectées et retenues afin d'éviter les fuites.
6. Pantalon selon l'une quelconque des revendications 1 à 5, dans lequel un matériau absorbant supplémentaire (8) est fixé au textile formé de couches, où il est alors fixé aux manchons hydrophobes (6).
7. Pantalon selon l'une quelconque des revendications 1 à 6, dans lequel une feuille (9) de matériau absorbant supplémentaire est fixée à l'intérieur du pantalon, entre la couche absorbante interne (1) et la couche imperméable intermédiaire stratifiée (2) et la couche externe (3).
8. Pantalon selon l'une quelconque des revendications 1 à 7, dans lequel le matériau absorbant supplémentaire forme un short interne (10) fixé à l'intérieur du pantalon, entre la couche absorbante interne (1) et la couche imperméable intermédiaire stratifiée (2) et la couche externe (3).
9. Pantalon selon l'une quelconque des revendications 1 à 8, dans lequel un textile superperméable (7) est fixé à la couche absorbante interne (1) 1 à 5 centimètres au-dessus des manchons, en permettant à tout liquide présent dans le pantalon de descendre le long des jambes pour passer dans une poche (16) formée du textile stratifié et du manchon (6), le textile superperméable (7) étant fixé à la partie du manchon hydrophobe (6) qui ne fait pas face à la peau et le textile stratifié étant fixé au manchon (6), de préférence par piqûre, le manchon le perméable (6) étant adjacent à la couche perméable externe (3) au niveau de la fixation.
10. Pantalon selon l'une quelconque des revendications 1 à 9, dans lequel, au niveau de la taille et des chevilles, un ruban constitué d'un matériau élastique ou non élastique renforce l'effet d'enveloppement des manchons.
11. Procédé de fabrication d'un pantalon entièrement intégré, lavable et réutilisable, capable d'absorber des liquides, selon l'une quelconque des revendications 1 à 10, comprenant les étapes qui consistent à :
- assembler par stratification une couche perméable externe (3) et une couche imperméable intermédiaire (2) ;
  - découper une feuille de textile stratifié (23) et une feuille de matériau absorbant (1) pour produire une forme désirée, et placer le textile stratifié (23) sur le matériau absorbant (1), la couche intermédiaire (2) étant en contact avec le matériau absorbant (1) ;
  - former des joints à l'avant et à l'arrière, et les joints internes de la surface ainsi que de la doublure ;
  - optionnellement, appliquer un ruban sur les joints ou les stratifier pour les rendre étanches à l'eau ;
  - préparer les manchons (6) ;
  - fixer la partie externe du pantalon, le textile stratifié (23), au manchon de la taille ;
  - préparer la ceinture, et la disposer dans le manchon (6) ;
  - fixer le manchon (6) à la couche interne (1) du pantalon ;
  - fixer les manchons (6) aux chevilles ou fixer un matériau superperméable (7) à la couche interne (1) près des chevilles et fixer le matériau superperméable (7) aux manchons (6) et fixer le matériau stratifié (23) aux manchons (6), la couche externe (3) étant en contact avec le manchon (6) au niveau du joint.
12. Utilisation du pantalon selon l'une quelconque des revendications 1 à 10 comme vêtement à porter pour dormir.

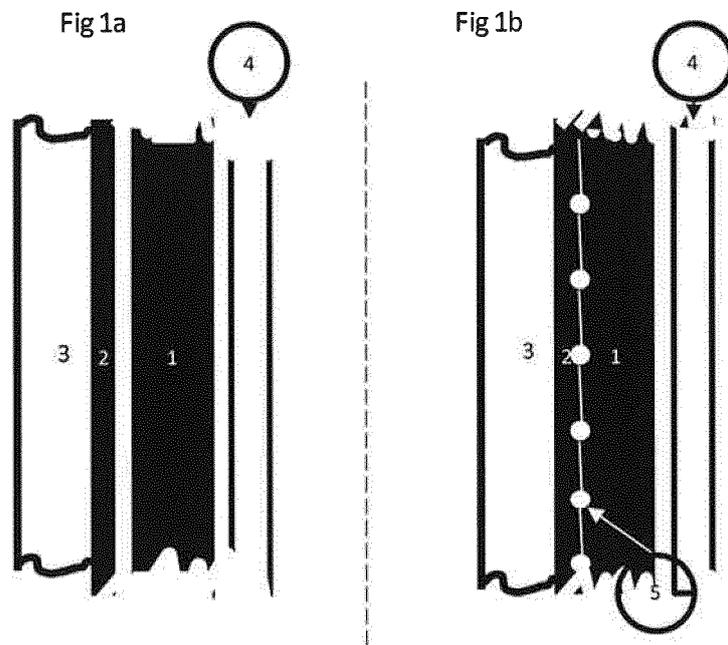


Fig 2

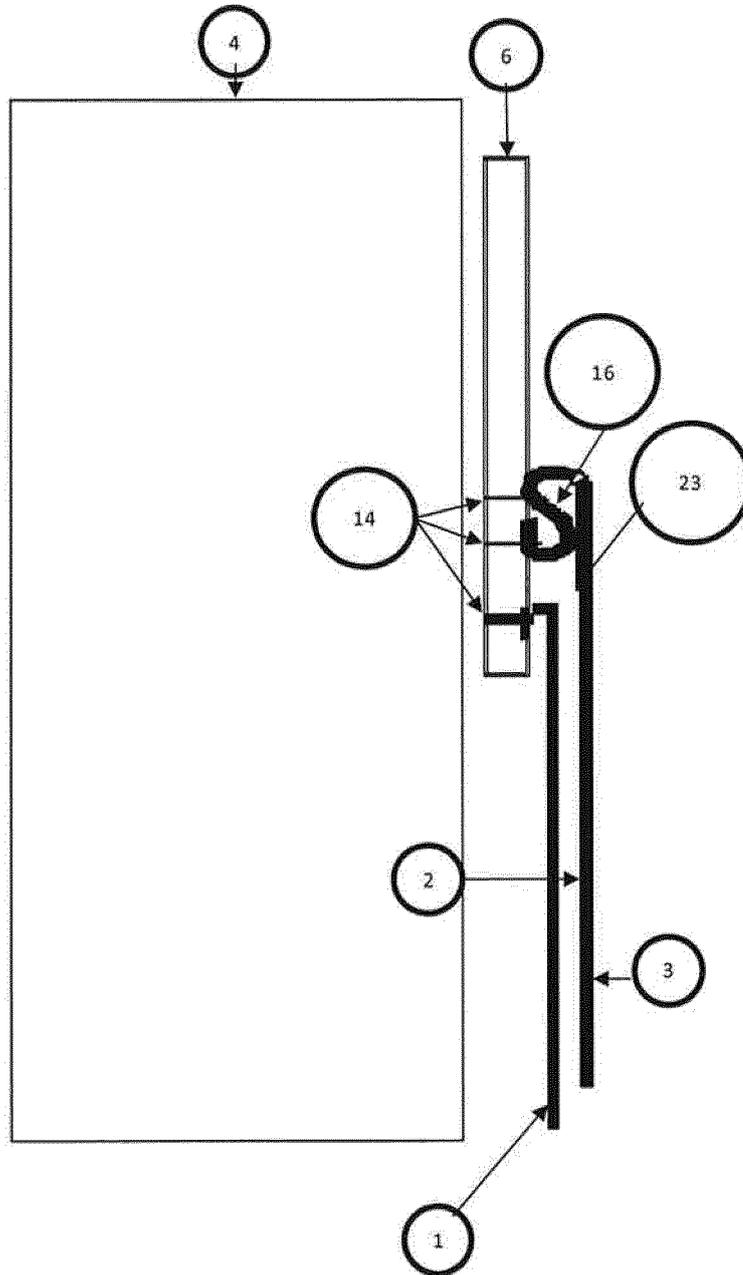


Fig 3

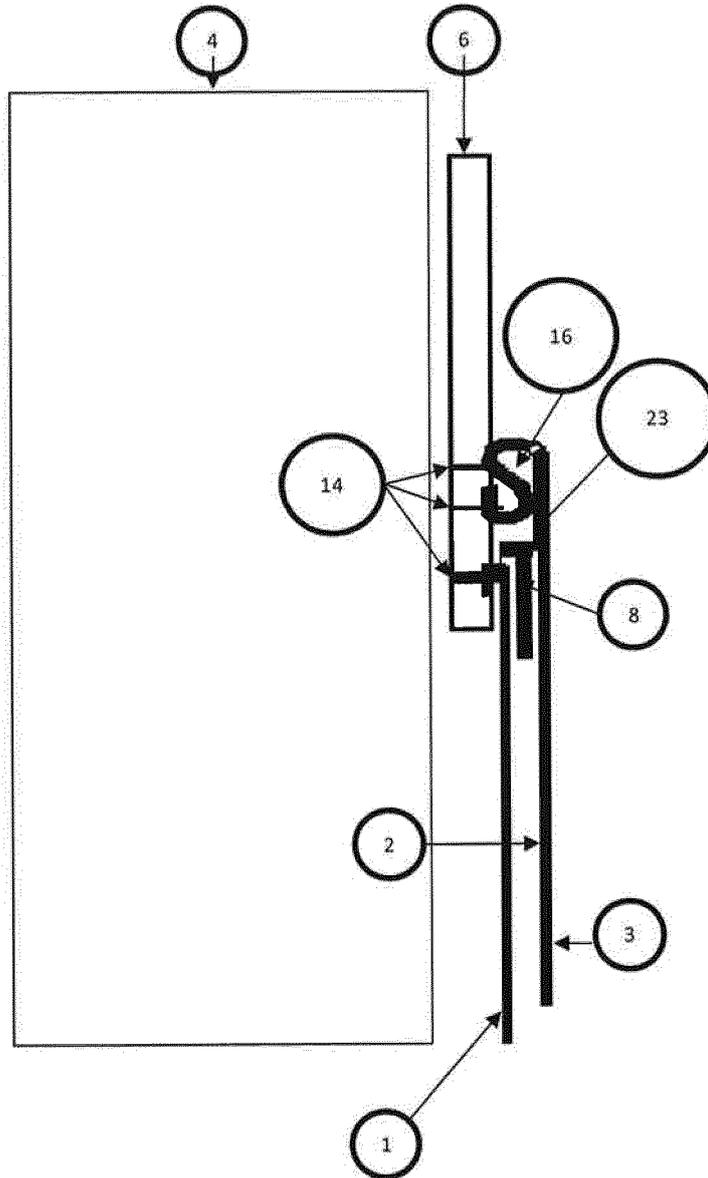


Fig 4

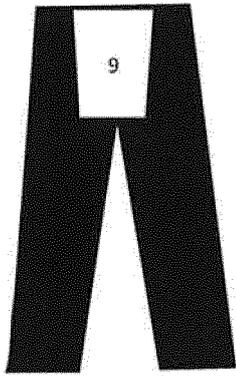


Fig 5

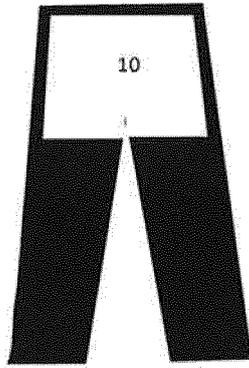


Fig 6

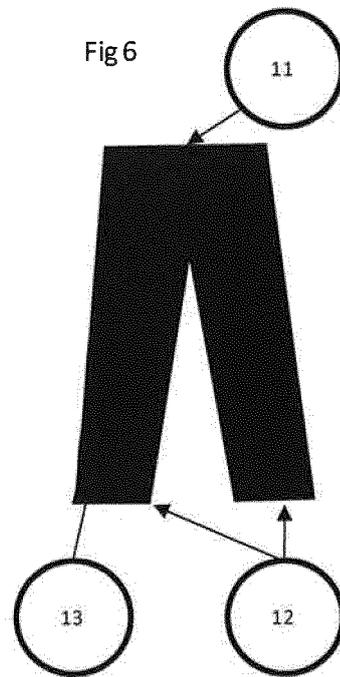


Fig 7

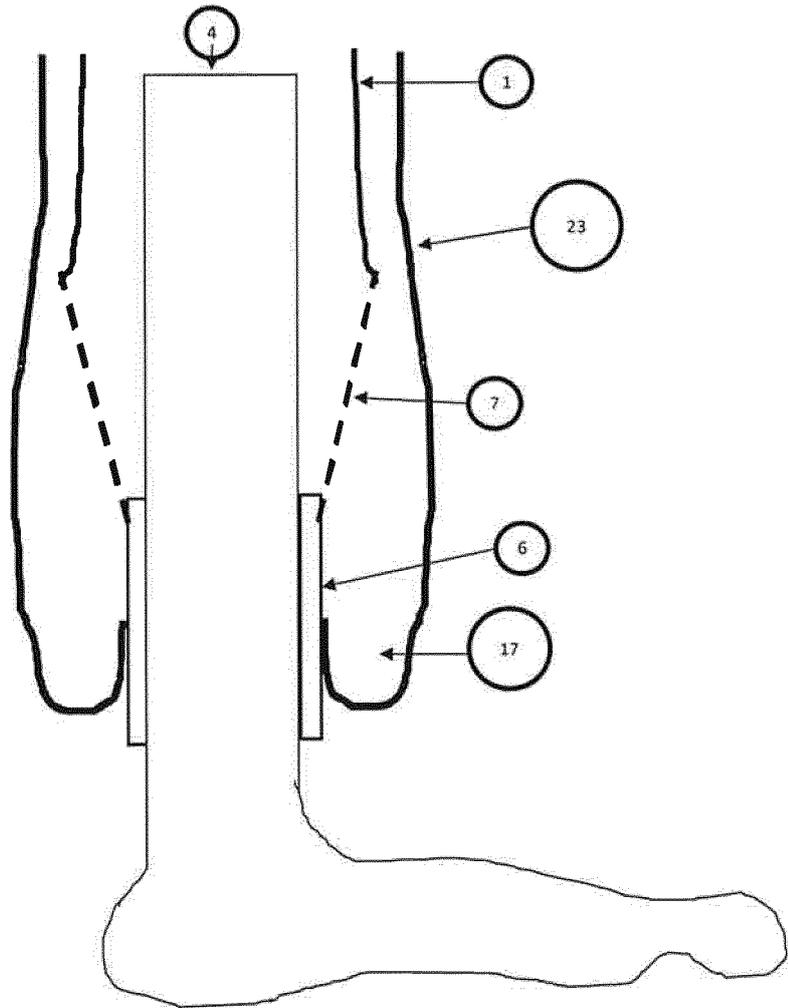


Fig 8

## When Manufacturing

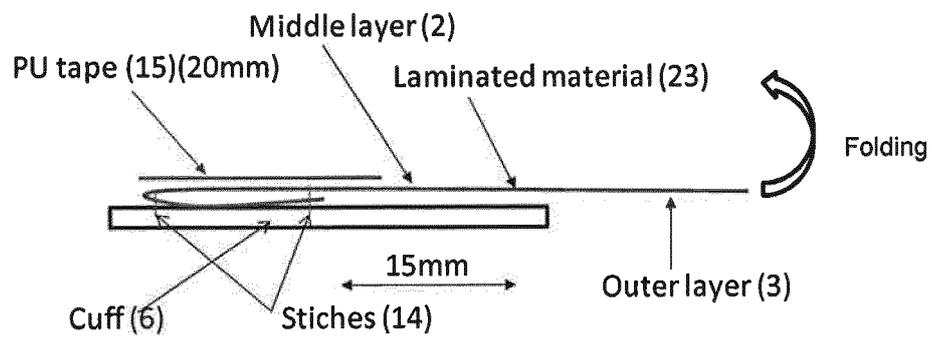
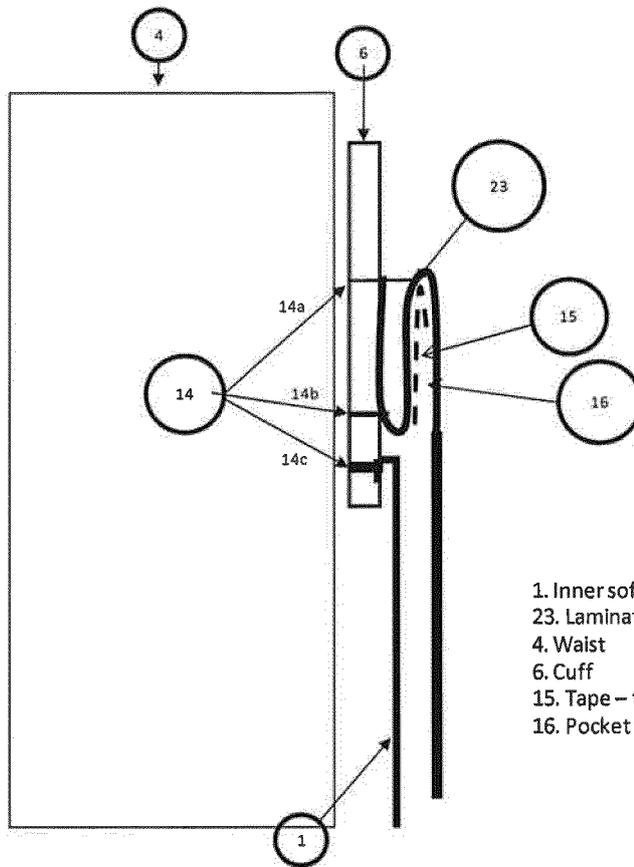


Fig 9



- 1. Inner soft and absorbing material
- 23. Laminated material
- 4. Waist
- 6. Cuff
- 15. Tape – the dotted line (covers the upper seam)
- 16. Pocket for excessive liquid

**REFERENCES CITED IN THE DESCRIPTION**

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