

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 November 2007 (01.11.2007)

PCT

(10) International Publication Number
WO 2007/122661 A1

(51) International Patent Classification:
A41D 27/24 (2006.01) *C09J 5/00* (2006.01)
B29C 65/00 (2006.01)

(21) International Application Number:
PCT/IT2007/000294

(22) International Filing Date: 20 April 2007 (20.04.2007)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
MI2006A000805 21 April 2006 (21.04.2006) IT

(71) Applicant (*for all designated States except US*):
GROTTO S.p.A. [IT/IT]; Via Ponte dei Granatieri,
4, I-36010 Chiuppano, VICENZA (IT).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **GROTTO, Roberto**
[IT/IT]; Via Giacomo Matteotti, 48, I-36010 Chiuppano,
VICENZA (IT).

(74) Agents: **GIUGNI, Diego** et al.; Jacobacci & Partners
S.p.A., Via Senato, 8, I-20121 Milano (IT).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

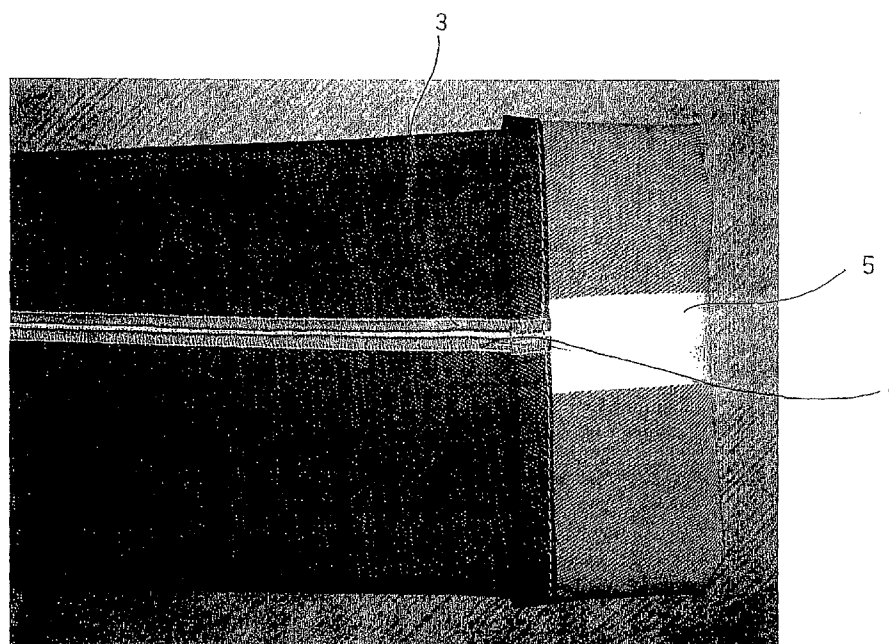
(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD FOR JOINING TWO OR MORE PIECES OF FABRIC AND RELATED ITEMS



(57) Abstract: The present invention relates to a method for integrally joining two or more pieces of fabric when manufacturing items such as items of clothing. The invention further relates to items of clothing made by means of said method for joining two or more pieces of fabric.

WO 2007/122661 A1

**A method for joining two or more pieces of fabric and
related items**

DESCRIPTION

TECHNICAL FIELD OF THE INVENTION

5 The object of the present invention is a method for integrally joining two or more pieces of fabric when manufacturing items such as items of clothing or upholstery, and the like. This invention further relates to items manufactured by means of said method for joining
10 two or more pieces of fabric such as items of clothing, upholstery, and the like.

BACKGROUND OF THE INVENTION

In the textile field, it has been for some time a well-established practice that two or more pieces of
15 cloth for manufacturing for example an item of clothing are only joined by sewing.

Seams are usually provided between cloth margins, with a fabric thread being alternately passed through each margin and on both sides of the respective margins.
20 The thread can be sewed more or less close to ensure either a greater or lower holding between the two margins according to the desired item to be made.

In any case, while seams ensure an optimum holding and are the conventional method for joining pieces of
25 cloth, mainly for items of clothing, however, they can

cause some drawbacks.

A major drawback with seams is mainly connected to items of clothing is caused by the friction occurring at the seams. In fact, due to the nature of seams, the thread that is passed several times through the cloth, for example of a pair of trousers, inevitably originates a rough area due to the thickness of the seam thread, which is necessarily larger than the surrounding fabric. Thereby, the seam forms a series of geometrical relieves on the fabric surface. Furthermore, in a pair of trousers, seams are often provided in those areas where friction against the body is the greatest. Accordingly, it is understood that this friction causes discomfort and reddening.

In the case of newborn or baby clothing, in addition to said friction drawback, a problem may also rise due to allergies that can be caused by certain types of threads used for seams. It has been proved that, in fact, allergies like contact dermatitis have been found to be due to the threads used for seams, which force people to give up wearing certain items of clothing.

Furthermore, it should be noted that a certain time is required for carrying out such an apparently simple operation like sewing, which time is connected on the one side to the type of seam to be made, and on the other

side to the efficacy of the methods being used. In fact, when a seam is provided by hand, it always requires quite a long time to be carried out, even when made by skilled operators. Furthermore, the requirement of conditioning
5 the holding is subordinate to the thread thickness, which as such, worsens the drawbacks set forth above.

SUMMARY OF THE INVENTION

The problem at the heart of the present invention is thus to provide a method for integrally joining two or
10 more pieces of fabric which is capable of resolving the drawbacks and problems stated above.

This problem is solved by means of a method for joining two or more pieces of fabric such as claimed in the annexed independent claim.

15 A first object of the present invention is thus a method for joining two or more pieces of fabric in a quick and effective manner while aiming at lightening the provision of seam threads, and the thickness thereof, with the advantage of avoiding allergies or discomfort
20 caused by friction.

A second object of the invention is to provide fabric-based items, such as items of clothing, wherein the pieces composing the same are joined by means of the aforesaid method which can be optionally associated with
25 traditional seam resulting from careful industrial

productive process.

BRIEF DESCRIPTION OF THE FIGURES

Further characteristics and advantages of the present invention will be better understood from the description below of an embodiment thereof, which is
5 given as a non-limiting example with reference to the figures in which:

- Fig. 1 is a top plane view of two fabric margins placed together, which are to be joined in accordance
10 with the invention;

- Fig. 2 is a top perspective view of the two margins in Fig. 1 in a first step of the joining method according to the invention;

- Fig. 3 is a top perspective view of the two
15 margins in Fig. 1 in a second step of the joining method according to the invention;

- Fig. 4 is a top perspective view of the two margins in Fig. 1 in a third step of the joining method according to the invention;

20 - Fig. 5 is a top perspective view of the two margins in Fig. 1 in a fourth step of the joining method according to the invention;

- Fig. 6 is a top plan view of a trouser leg portion made according to the invention;

25 - Fig. 7A is a schematic view of a first variant

embodiment of the invention;

Fig. 7B is a schematic view of a second variant embodiment of the invention;

- Fig. 7C is a schematic view of a third variant
5 embodiment of the invention;

- Fig. 7D is a schematic view of a fourth variant embodiment of the invention;

- Fig. 7E is a schematic view of a fifth variant embodiment of the invention.

10 DETAILED DESCRIPTION OF THE INVENTION

The concept at the heart of the present invention is that of replacing the seam thread with a different means for joining two or more pieces of fabric, or at least reducing the thickness or amount thereof and
15 complementing the joining of said pieces with said means while maintaining optimum resistance characteristics.

In order to develop this concept, it has been surprisingly found that two pieces of fabric can be joined to each other in a very effective manner using a
20 particular type of adhesive that is directly applied at the edges of said pieces to be joined or by means of a double-adhesive tape, which becomes the substrate, and by subjecting said edges of said pieces to a pressure heat sealing process.

25 Particularly, the method for joining two or more

pieces of fabric comprises the following sequential steps:

- providing two or more pieces of woven or nonwoven fabric;
- 5 - pre-heating at least the edges of said pieces that are to be joined;
- applying a layer of bioadhesive consisting of a polyester-based polyurethane polymer in the liquid state on at least one of the
- 10 respective edges of said pieces to be joined;
- applying pressure and heat to heat-melt and press said polymer layer such as to cause the latter to penetrate between the fibers
- 15 of said pieces of woven or non woven fabric and create an integral join to each other.

It should be noted that by "fabric" is meant herein a material obtained by weaving warp and weft fibers, whereas by "nonwoven fabric" is designated a material of which the fibers, either of natural or synthetic origin, are randomly arranged and interlaced by means of techniques such as mechanical needling, pressure hydro-needling, heat-sealing.

Particularly, it has been observed that when the margins of woven or nonwoven fabric are subjected to a

pre-heating step at a temperature ranging between 50°C and 200°C, preferably 100°C and 200°C, more preferably 170°C before applying the polymeric adhesive layer and subsequently pressure heat-sealing, the function of the adhesive polymeric layer joining said pieces is surprisingly enhanced in terms of tear strength, wash strength and subsequent finishing, standard usage and ageing resistance treatments.

Preferably, the pre-heating step can be carried out by blowing a jet of hot air on said edges.

The polyester-based polyurethane polymer has been selected such as to offer the technical condition required for the best performance of the final product both for the industrial manufacture of the latter and for
5 the life of the product (item of clothing) that is subjected to a considerable physical-chemical stress such as washing, temperature changes, physical stress.

Furthermore, a polyester-based polyurethane polymer has been preferably selected to be characterized by 78A shore hardness, 124°C softening point, and Melt Flow Index of 13-18.5 dg/min at 190°C, 2.16 kg. A polymer provided with said physical-chemical characteristics advantageously allows meeting particular requirements of strength and holding, softness, elasticity, extensivity, and wash resistance for the final product.

In fact, it should be taken into account that an item of clothing is generally affected by a number of factors, among which material selection, friction, surface load, smoothness as well as surface hardness and lubrication. By selecting said characteristics, a wear-free product has been advantageously obtained which lacks holding defects between the joining points of the woven or nonwoven fabric pieces composing the final product.

Preferably, the polyester-based polyurethane polymer is a second-generation elastomeric polyurethane provided with a very good binding force at low activation temperatures while maintaining optimum characteristics of softness, extension and recovery.

Furthermore, the Shore Hardness value stated above, which is also designated as the softness indicator, has been calculated using a durometer.

The Softening Point value, also designated as the softening level, has been calculated in accordance with DIN 51005 standard.

The Melt Flow Index value, also designated as the fluidity, has been calculated as an output flow in decigrams/min through a standard orifice of 2.0955 ± 0.0051 mm diameter and 8.000 ± 0.025 mm length when a fixed pressure is applied to the fluid by means of a piston and a total mass load of 2.16 kg at a temperature

of 190°C.

Furthermore, the polymer used in the present invention is preferably characterized by a weight of 32 g/m² for a thickness of 25 µm, 46.5 g/m² for a thickness of 40 µm, 62 g/m² for a thickness of 50 µm and 124 g/m² for a thickness of 100 µm.

Generally, the polymer characteristics comprise an operating temperature ranging between -30°C and 130°C, lamination conditions (hot roll laminator, belt laminator or plate laminator) at a temperature ranging between 140° and 180°C at a pressure between 2.8 and 4.2 Bar for 10 seconds, melt conditions ranging between 115° and 120°C at 2.8-4.2 Bar for 25 seconds according to the type of equipment used, moulding conditions at a temperature of 200°C for 30 seconds.

During the step of applying temperature and pressure, pressures are generally used ranging between 1.3 bar and 7 bar and temperatures ranging between 140°C and 220°C, for a time ranging between 10 sec and 30 sec. Preferably, pressure ranges between 5.5 bar and 6.5 bar, more preferably 6 bar, whereas the temperature ranges between 195°C and 205°C, more preferably it is 200°C and the time is 19 sec to 21 sec, more preferably it is 20 sec.

In addition, right after applying heat and pressure,

the method can comprise a step of cooling the joined pieces ranging from 1 to 5 minutes, preferably 2 minutes before subjecting said pieces to further processing. This step is carried out by leaving the pieces on the same support on which the heating and pressure step has been carried out, whether a press basement, an ironing board, or a support belt subjected to pressure by means of two heated rolls.

The function of this step is to allow a gradual cooling without causing thermal shocks to the adhesive and thus ensuring an optimum functionality.

Preferably, furthermore, the method in accordance with the present invention comprises a preliminary step of treating the edges of said pieces of fabric such as to remove impurities and residues of glues or chemicals that can alter the function of the polymeric adhesive. Particularly, this treatment can comprise, in turn, washings, oxidative and/or enzymatic desizing, bio-polishing, stone-polishing.

In addition, the method can comprise, after this treatment step, a step of processing said edges by means of salvaging.

A final settling step can be also provided at the end of the cooling step, in order to ensure that the polyurethane adhesive binds under controlled temperature

conditions ranging between 18°C and 30°C, preferably between 20°C and 25°C and humidity ranging between 10% and 30% for a time not lower than 12 hours, preferably between 18 and 24 hours. This step further allows ensuring that the item of clothing can be washed even under sever conditions, finishing and standard usage by the purchaser without experiencing a decrease in the quality of the join of the pieces of fabric composing this item of clothing.

Generally, the step of applying the polymeric layer can be carried out by applying a ribbon-like backing on which said polymeric adhesive layer is spread, or by depositing the polymeric layer directly on the edges of said pieces of woven or nonwoven fabric.

The first method for applying the polymeric layer on the edges by means of adhesive tape with bio-polymeric adhesive as described above, will be described below with reference to Fig. 1 to 6.

In Fig. 1, a first piece of fabric is generally designated with 1 and a second piece of fabric with 2.

The first piece 1 and second piece 2 of fabric lay on a same plane such that the respective edges 3 and 4 face each other.

Preferably, the edges 3 and 4 are provided with a salvage seam to prevent the fiber composing the piece of

fabric from unravelling and optionally to provide an aesthetic value. Particularly, the seam can be "an overcast stitch" (three threads) or "a chain stitch" (five threads).

After the pieces of fabric have been arranged as discussed above, a double-adhesive tape 5 is placed on both pieces 1 and 2 along the edges 3 and 4 as shown in Fig. 2.

The double adhesive tape 5 consists of a thin, heat-resistant backing 6 having a substantially plane shape, and being provided with a first face 7 and a second face 8. Furthermore, said first 7 and second 8 faces are covered with a web of heat-sealing substance such as that described above, which is in turn protected by a removable heat-resistant strip 7', 8'.

One of the two protective strips 7', 8' (the strip 7', in Fig. 2) is removed to allow placing the double-adhesive tape 5 onto the seams 3, 4 such that the heat-sealing substance web on the surface 7 of said tape 5 completely covers the seams.

After the tape 5 has been placed as said above, it is subjected to pressing and heating pressure. The pressure generally ranges between 4 bar and 7 bar, whereas the temperature ranges between 190°C and 220°C for a time ranging between 18 and 22 sec. Preferably, the

pressure ranges between 5.5 bar and 6.5 bar, more preferably it is 6 bar, whereas the temperature ranges between 195°C and 205°C, more preferably it is 200°C and the time is 19 to 21 sec., more preferably it is 20 sec.

5 Heat-sealing can be carried out by means of conventional methods and equipment, such as hot pressing with a corresponding press, or as schematically shown in Fig. 3, pressing between two counter-posed overheated rolls, the portion of fabric covered with the double-
10 adhesive tape 5 being passed therethrough in the direction indicated by the arrow in Fig. 3.

Preferably, heat-sealing can be carried out in two different steps in which said step of applying the temperature and pressure is followed by a so-called
15 ironing step which is usually carried out to prepare the item of clothing for sale and is simply ironing this item. In the method according to the present invention, this ironing step is carried out in a substantially identical manner as the step of applying temperature and
20 pressure described above for the application of the polymeric bio-adhesive layer.

Particularly, by way of non-limiting example, said two steps can be carried out in accordance with two different types of machines and the following settings:

25

--	--

Operation	Application of bio-adhesive strip cod. 3405 150 Micron 10 mm
Machine	MACPI 30
Temp.	170°C
Speed	3m/min
Pressure	1.4 Atm effective
Operation	Pressure with a gluing press egde/strip
Machine	MACPI 9134
Temp.	180°C
Time Machine	20 sec.
Pressure	6.0 Atm effective

As stated above, due to pressure and temperature, the heat-sealing substance cures between the fabric weave in the vicinity of both pieces 3, 4 thus bridling them and making said pieces integrally joined to each other.

5 The method described above can be carried out on a surface of the two pieces 3, 4 of fabric, preferably on that surface which will be hidden after the item has been completed. For example, when making a pair of trousers, as shown in Fig. 6, the tape 5 can be provided to be
10 applied on the inner side of a trouser leg. Thereby, the tape 5 would be hidden without altering the aesthetic characteristics of the trouser itself.

Furthermore, the method can comprise a step of applying a band on the double-adhesive tape 5.

15 Particularly, the double-adhesive tape 5 may cause discomfort, in turn, when it comes in contact with the

body. In this regard, as shown in Fig. 4, the protective strip 8' can be removed from the free surface 8 of tape 5 to allow said band to be applied. In fact, by this operation, a further web of heat-sealing substance is exposed, on which a band 11 is placed and heat-sealing is subsequently carried out between the band and tape in a completely similar manner as described above.

The band 11 can be any pre-cut tape, such as to cover the tape 5. Particularly, the band 11 can be made of a soft, comfortable and antiallergic fabric to give, for example, an optimum fit to the item clothing. Advantageously, the band also has the function of increasing the resistance of the sealing of the two pieces 3, 4 of fabric.

In accordance with a variant embodiment of the invention, the method can be carried out on the surface of the two pieces 3, 4 of fabric exposed to sight. In this case, the same operations will be carried out as described above, except that the band 11 may be decorative, and thus offer the opportunity of customizing an item of clothing, for example, such as a pair of trousers.

A further variant embodiment of the invention is applying the double-adhesive tape 5 on both surfaces of the pieces 3, 4 of fabric.

The advantage of applying double-adhesive tape 5 on said surfaces is that the strength of the sealing between the pieces 3, 4 is increased, mainly in case of items of clothing that must meet particular requirements. For example, a greater strength is often required for traditional seams of work or children clothes at the conventional sewing. This arrangement allows obtaining the desired strength while avoiding the aforesaid drawbacks connected to traditional seams.

10 In accordance with the second application procedure, a layer of polymeric bioadhesive such as that discussed above is directly applied on the edges of said pieces of woven or nonwoven fabric to be joined by carrying out entirely conventional operations.

15 Particularly, the modes of positioning the edges or margins of woven or nonwoven fabric are schematically represented in the annexed Fig. 7A-7E.

In Fig. 7A, a join is shown between two pieces T of woven or nonwoven fabric, which are both positioned such as to have the same face on the same side, by overlapping the two edges E with a polymeric bioadhesive layer A being interposed therebetween. This type of join is known in the field as the rightside to backside join.

In Fig. 7B, a join is shown between two pieces T of woven or nonwoven fabric by overlapping the two edges E

25

with a polymeric bioadhesive layer A being interposed therebetween, which is similar to that shown in Fig. 7A except that the pieces T being on a same side face the right side (i.e. the face considered as being exposed
5 when the finished product is worn) and the other on the back side (i.e. the face opposite the right side). This type of join is known in the field as the backside to backside join.

In Fig. 7C, a join is shown between two pieces T of
10 woven or nonwoven fabric by overlapping the two edges E with a polymeric bioadhesive layer A being interposed therebetween, similar to that shown in Fig. 7A, except that an edge E' of a piece T is folded before applying the adhesive A. This type of join is known in the field
15 as the rightside to right folded join.

In Fig. 7D, a join is shown between two pieces T of woven or nonwoven fabric by overlapping the two pieces T such that the equal faces are faced to each other, and by folding the edges E' before interposing a polymeric
20 bioadhesive layer A. This type of join is known in the field as the right folded to right folded join.

In Fig. 7E, a join is shown between two pieces T of woven or nonwoven fabric by overlapping the two edges E' and E'' with two polymeric bioadhesive layers A' ed A''
25 being interposed therebetween, similar to that shown in

Fig. 7A, except that one of the two edges E' of a piece T has been folded and a first layer A' and a second layer A'' are deposited between within the fold and between the fold and edge E'' of the other piece T, respectively.

5 This type of join is known in the field as the two glue-coat join.

According to a further variant embodiment of the invention, as stated above, the method can comprise a traditional sewing step by means of a very fine thread,
10 preferably a thread having a titre ranging between 18 and 36. Alternatively, the thread can be a thread conventionally used for sewing but the seam can be made such that the stitches are loose or positioned only in certain parts of the finished product, or in addition,
15 the seam can be conventional but covered by an adhesive tape such as that described above.

In accordance with a further object of the invention, a fabric item is provided which comprises one or more pieces of fabric that are joined according to the
20 method described above.

Particularly, the item comprises two or more pieces of fabric that are joined by means of heat-sealing. Said pieces are heat-sealed to each other for example at the free edges thereof. Preferably, the free edges are
25 salvage sewed. More preferably, the heat-sealed edges are

covered with bands made of antiallergic and/or soft
and/or reinforcement material optionally with writings
and/or decorative drawings. Furthermore, the bands can be
applied to either one or both counter-posed surfaces of
5 the item.

Preferably, said item comprises items of clothing,
upholstery, and the like. Particularly, the item of
clothing is selected from trousers, jeans, shirts, coats,
jackets, jerseys, sweaters.

10 The fabrics of the items of clothing can be
conventional cotton, wool, polyester, denim and mixes
thereof.

Obviously, to the method and item according to the
present invention, those skilled in the art, aiming at
15 meeting contingent and specific requirements, may carry
out further modifications and variations, all being
however contemplated within the scope of protection of
the invention, such as defined in the annexed claims.

CLAIMS

1. A method for joining two or more pieces of fabric comprising the following sequential steps:

- providing two or more pieces of woven or
5 nonwoven fabric;
- pre-heating at least the edges of said pieces at a temperature ranging between 50°C and 200°C;
- applying on at least one of the respective
10 edges of said pieces to be joined a bioadhesive layer consisting of a polyester-based polyurethane polymer;
- applying pressure and heat to heat-melt and press said polymer layer such as to cause
15 the latter to penetrate between the fibers of said pieces of woven or non woven fabric and create an integral join to each other.

2. The method according to claim 1, wherein the step of applying temperature and pressure provides using
20 pressures ranging between 1.3 bar and 7 bar and temperatures ranging between 140°C and 220°C, for a time ranging between 10 sec and 30 sec.

3. The method according to claim 2, wherein the pressure ranges between 5.5 bar and 6.5 bar, more preferably it is
25 6 bar, whereas the temperature ranges between 195°C and

205°C, more preferably it is 200°C and the time is 19 sec to 21 sec, more preferably it is 20 sec.

4. The method according to any claim 1 to 3, wherein the polyester-based polyurethane polymer has 78A shore hardness, 124°C softening point, and Melt Flow Index of 13-18.5 dg/min at 190°C, 2.16 kg.

5. The method according to any claim 1 to 4 further comprising a preliminary step of treating the edges of said pieces of fabric such as to remove impurities and residues of glues or chemicals that can alter the function of the polymeric adhesive.

6. The method according to claim 5, wherein this treatment comprises washings, oxidative and/or enzymatic desizing, bio-polishing, stone-polishing.

7. The method according to claim 5 or 6, further comprising, after said treatment step, a step of working said edges by means of salvaging.

8. The method according to any claim 1 to 7, further comprising a final settling step at the end of the step of applying heat and pressure carried out under controlled conditions of temperature ranging between 18°C and 30°C and humidity ranging between 10% and 30% for a time of no less than 12 hours.

9. The method according to any claim 1 to 8, further comprising an ironing step after the step of applying the

temperature and pressure.

10. The method according to any claim 1 to 9, wherein said step of applying a bioadhesive layer is carried out using a double-adhesive tape (5) that is bridge-connected
5 between said edges placed in contact with each other.

11. The method according to claim 10, wherein said double-adhesive tape (5) comprises a heat-resistant backing (6) having a first face (7) and a second face (8) covered with a web of heat-sealing substance, which is,
10 in turn, protected by a removable heat-resistant strip (7', 8').

12. The method according to claim 11, wherein one of the two protective strips (7', 8') is removed to allow the double-adhesive tape to be laid on the seams (3, 4).

13. The method according to any claim 1 to 12, wherein
15 the pressing and heating step is carried out by means of a hot press or by passing through two overheated rolls.

14. The method according to any claim 10 to 13, wherein said method is carried out on either one or both surfaces
20 of said at least two (1, 2) pieces of fabric.

15. The method according to any claim 10 to 14, further comprising a step of applying a band (11) to cover said double-adhesive tape (5).

16. The method according to any claim 1 to 8, wherein
25 said step of applying a bioadhesive layer is carried out

by applying the bioadhesive layer directly on at least one of said edges.

17. The method according to claim 16, wherein the joining of said pieces is carried out by rightside to backside join, backside to backside join, rightside to right folded join, right folded to right folded join, or two bioadhesive-coat join.

18. The method according to any claim 1 to 17, further comprising a thread sewing step for joining said edges of said pieces of woven or nonwoven fabric.

19. The method according to claim 18, wherein said sewing is carried out with a thread having a titre ranging between 18 and 36.

20. The method according to any claim 1 to 19, further comprising a gradual cooling step ranging between 1 and 5 minutes to avoid thermal shocks to said polymeric adhesive right after the heating or pressing step.

21. A woven or nonwoven fabric item obtainable according to the method in accordance with any claim 1 to 20.

22. The item according to claim 20, comprising two or more pieces of woven or nonwoven fabric in which the seams are replaced or complemented with heat sealings.

23. The items according to claim 21 or 22 comprising items of clothing, drapery, and the like.

24. The item according to claim 23 wherein said items of

clothing comprise trousers, shirts, coats, jeans,
jackets.

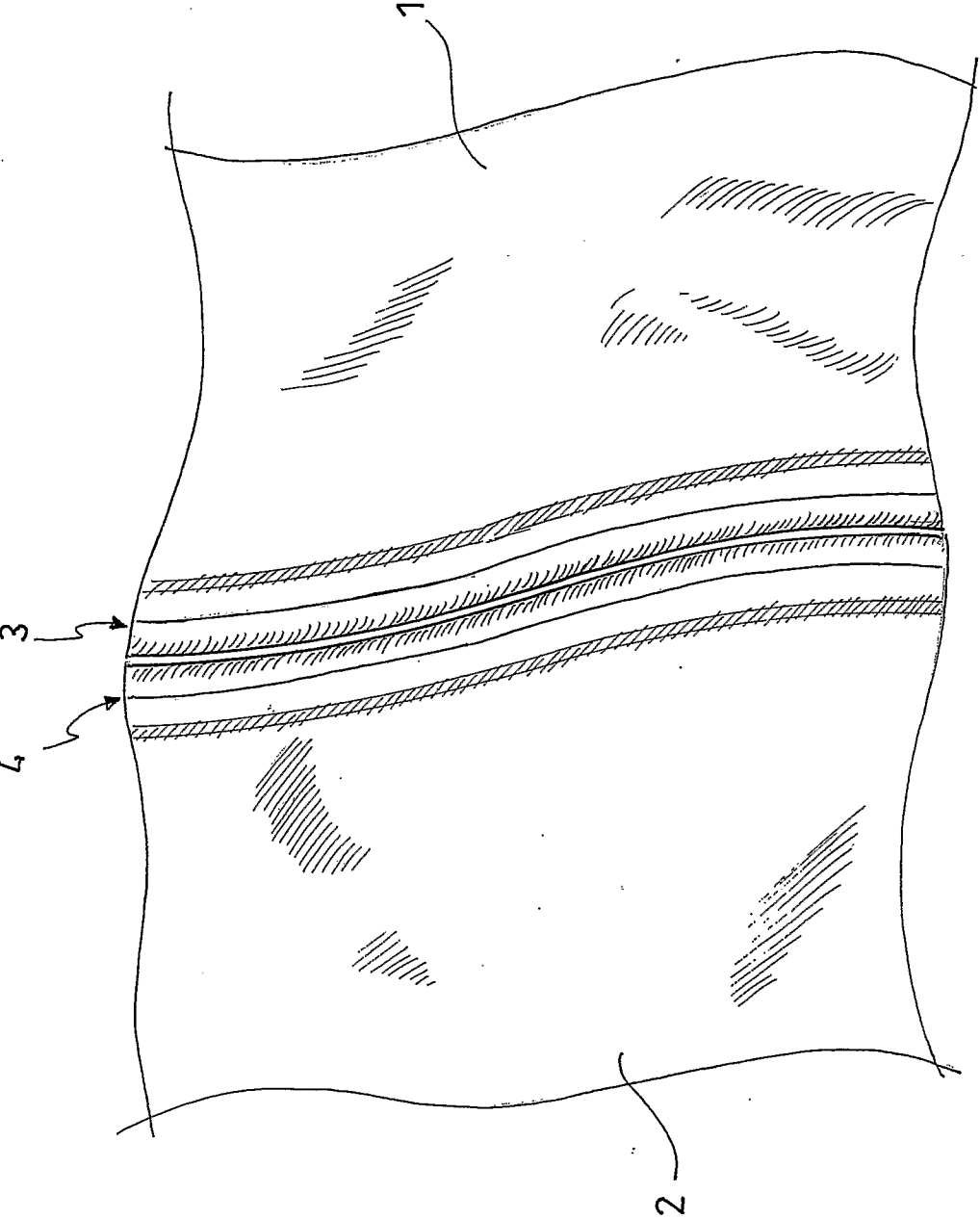


FIG.1

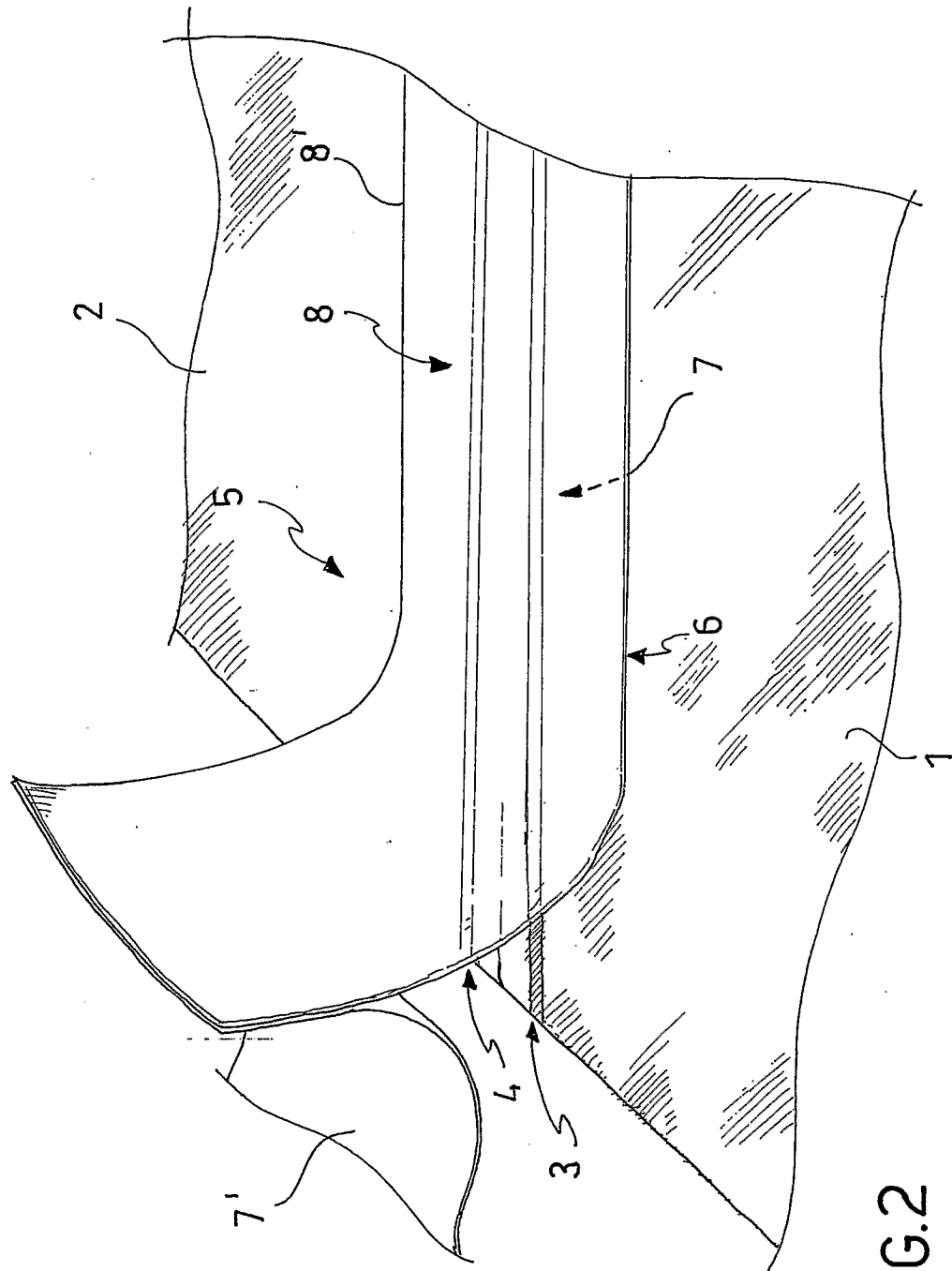


FIG. 2

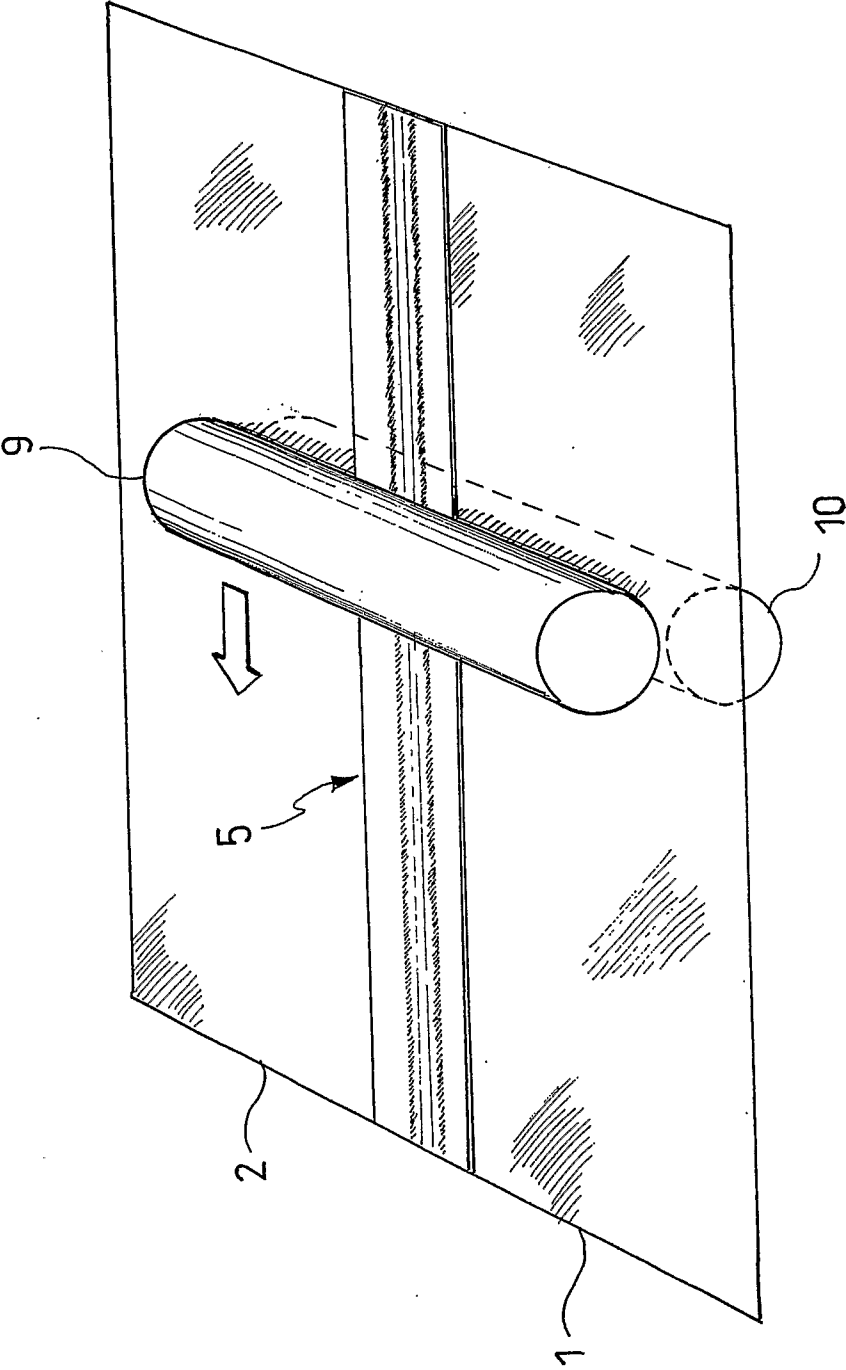


FIG. 3

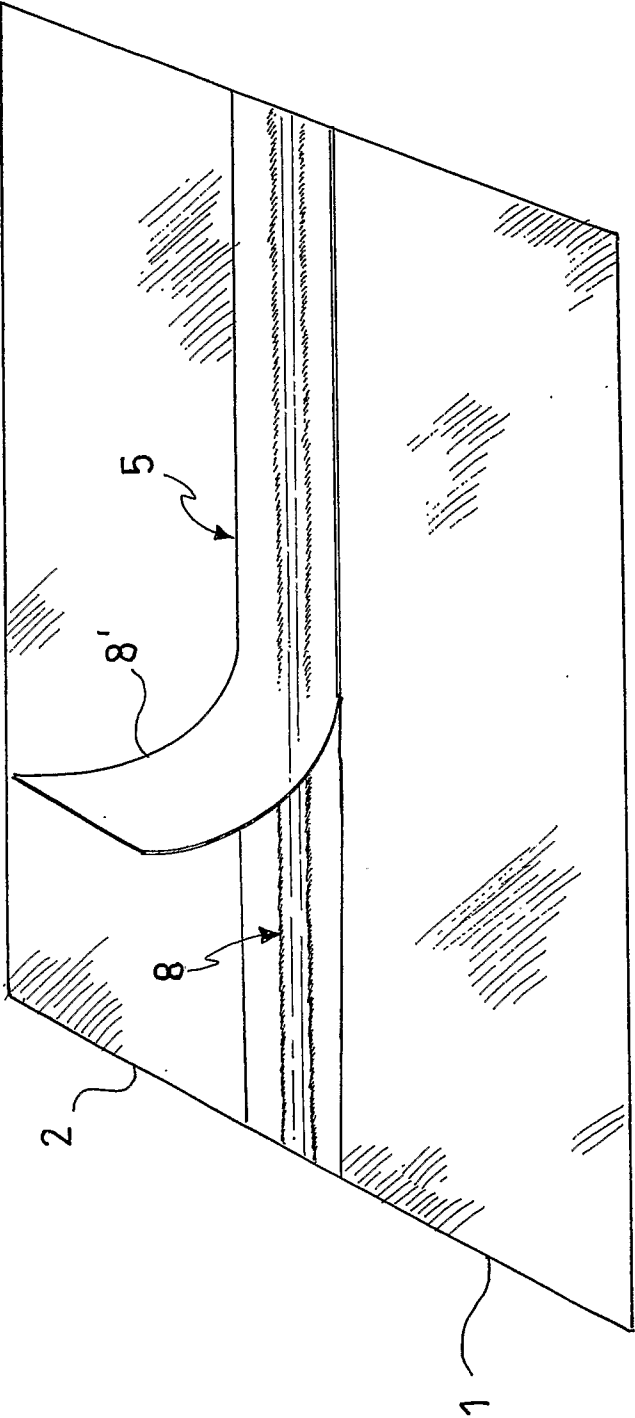


FIG. 4

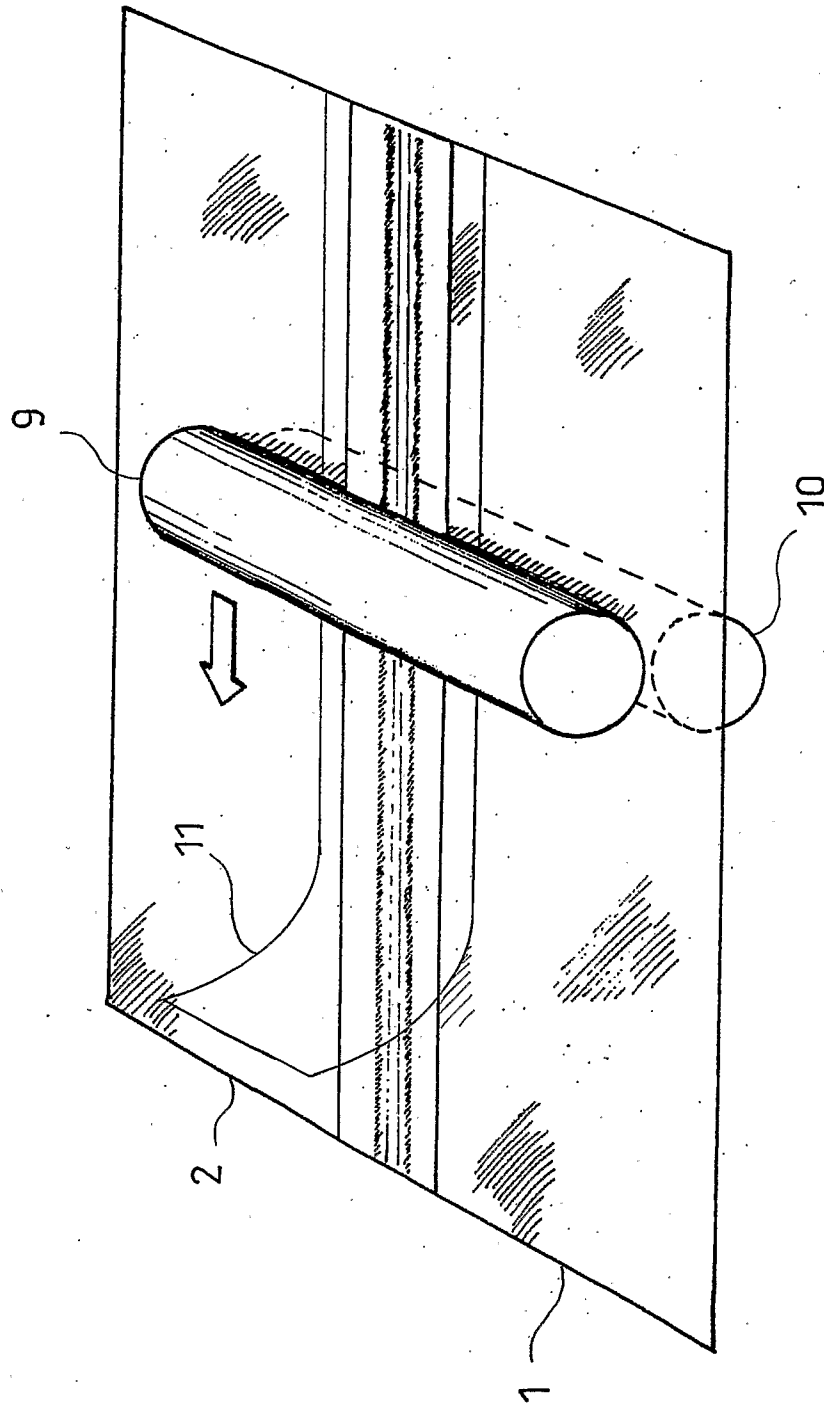


FIG. 5

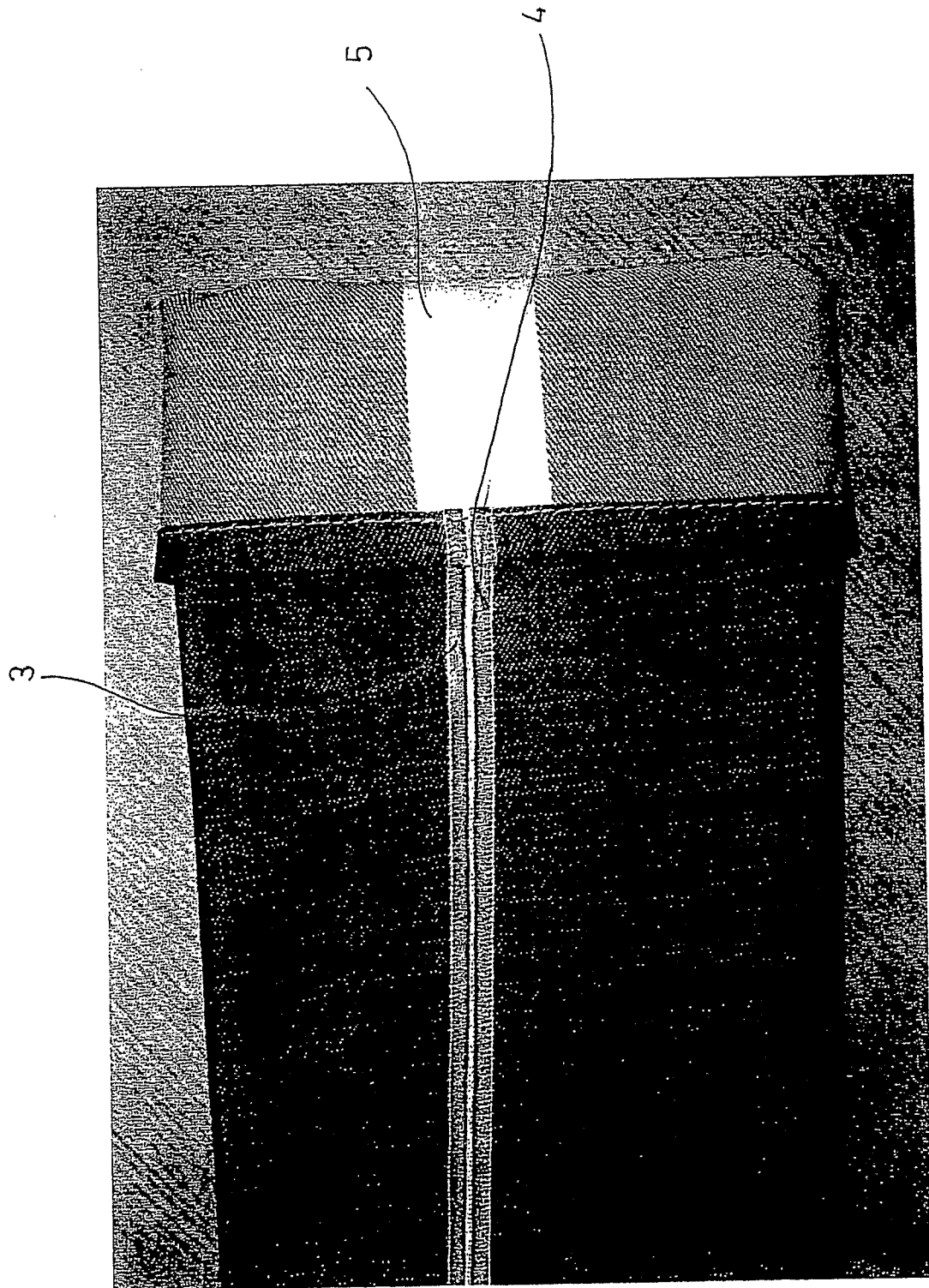


FIG. 6

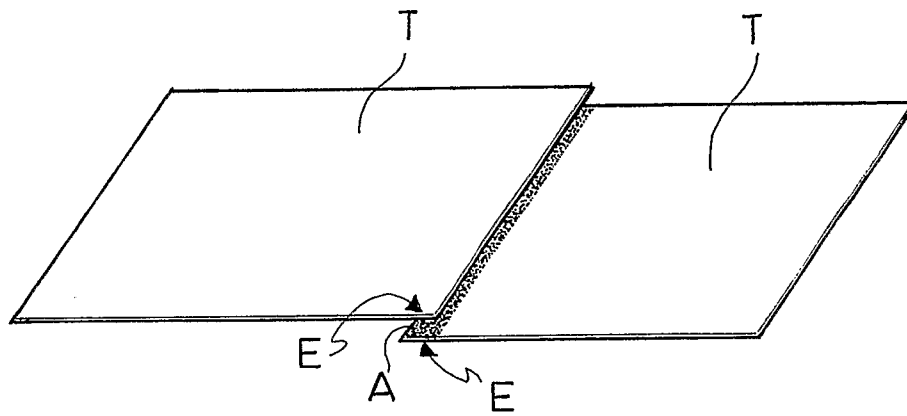


FIG. 7A

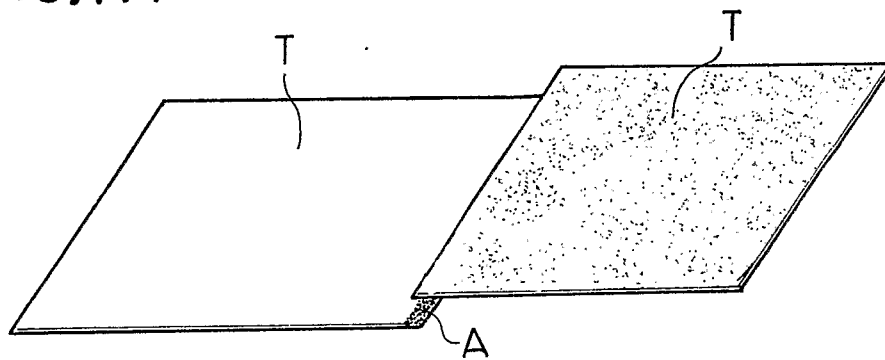


FIG. 7B

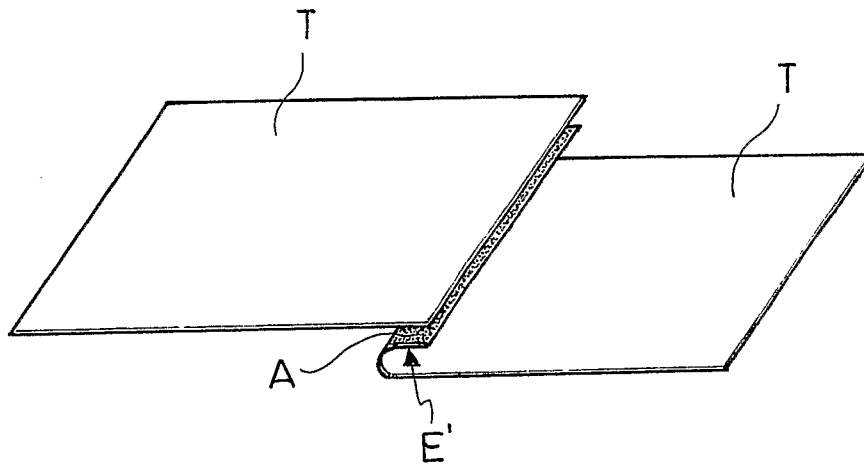


FIG. 7C

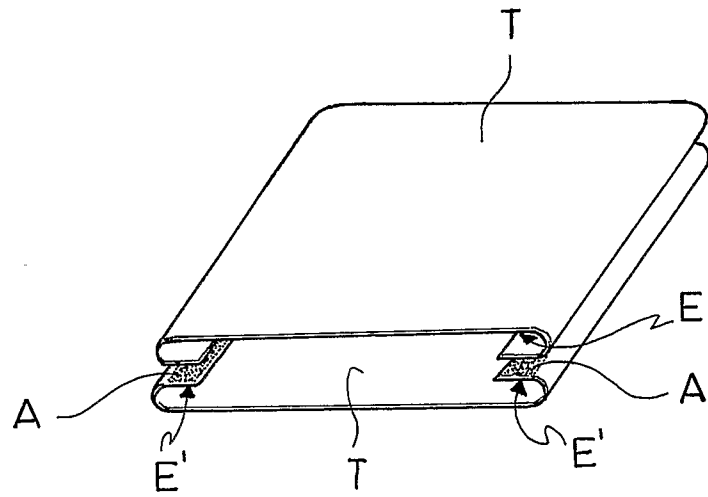


FIG. 7D

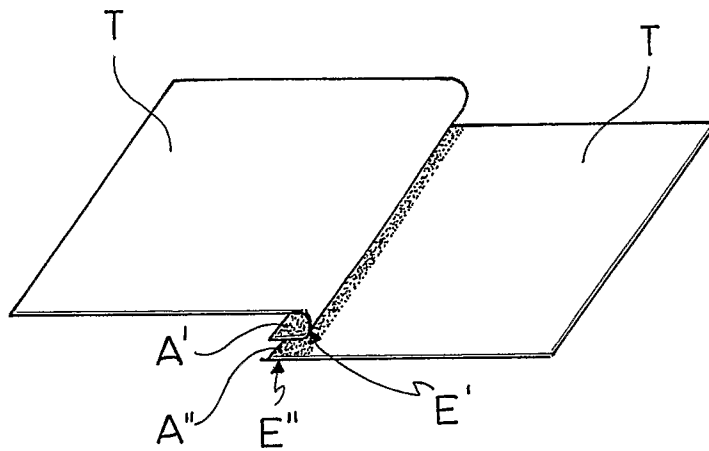


FIG. 7E

INTERNATIONAL SEARCH REPORT

International application No

PCT/IT2007/000294

A. CLASSIFICATION OF SUBJECT MATTER

INV. A41D27/24 B29C65/00 C09J5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A41D B29C C09J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 708 163 A (TOYO CLOTH CO [JP]; TOYO KNITTING CO LTD [JP]) 24 April 1996 (1996-04-24) page 2, line 53 example 1 page 2, line 27 - line 32 figures 5-7	21-24
A	US 5 885 679 A (YASUE MASA HARU [JP] ET AL) 23 March 1999 (1999-03-23) the whole document	
A	US 2005/230026 A1 (KRAMER PAUL F [US] KRAMER PAUL FREDERICK [US]) 20 October 2005 (2005-10-20) the whole document	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

12 July 2007

Date of mailing of the international search report

19/07/2007

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

TRAUNER, H

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IT2007/000294

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0708163	A	24-04-1996	AU 2040295 A JP 8120231 A	02-05-1996 14-05-1996
US 5885679	A	23-03-1999	CN 1171826 A CN 1220942 A EP 0791674 A1 FI 972044 A HK 1019720 A1 WO 9616220 A1 JP 3547138 B2 NO 972193 A	28-01-1998 30-06-1999 27-08-1997 19-05-1997 19-07-2002 30-05-1996 28-07-2004 17-07-1997
US 2005230026	A1	20-10-2005	NONE	