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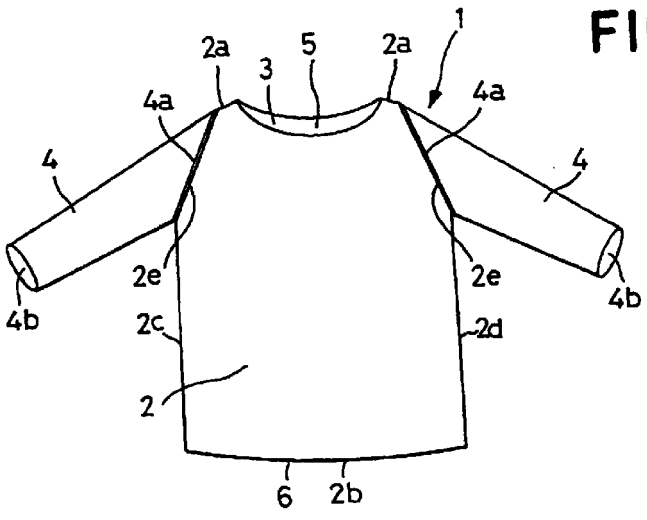
(54) DISPOSABLE JACKET AND PRODUCTION METHOD THEREOF

(57) A disposable upper garment 1 comprises right- and left-hand sleeve members 4, 4 having arm holes 4a, 4a and wrist-openings 4b, 4b, a front body sheet 2 having a pair of arm holes 2e, 2e and a rear body sheet 3 having a pair of arm holes 3e, 3e, wherein peripheries of the arm holes 4a, 4a defined by upper ends of the sleeve members 4, 4 are bonded to the associated peripheries of the arm holes 2e, 3e of the front and rear body sheets 2, 3, and the front and rear body sheets 2, 3 are bonded to each other along their transversely opposite side edges 2c, 2d; 3c, 3d with narrow marginal regions of these side edges 2c, 2d; 3c, 3d left free, and along portions of the upper end defined between the neckline 5 and the pair of sleeve members 4, 4.

FIG. 1



EP 1 060 679 A1

Description

FIELD OF THE INVENTION

[0001] This invention relates to a disposable upper garment and a process for making the same.

BACKGROUND ART

[0002] Recently there has been an increased demand for disposable upper garments adapted to be worn not only by medical team including physicians and nurses but also by patients during surgical operation and traveler or diagnosis and to be disposable after a single use. Such disposable garments are required to be mass-producible at a lower cost. Accordingly, it is not suitable to use known manufacturing processes of usual garments for making such disposable garments. As far as the inventors know, none of the techniques meeting the demand has been disclosed in any documents except for the case of disposable diapers. Considering the fact that the disposable pull-on diaper is exclusively used as the undergarment adapted to absorb and contain body wastes, the techniques for making the usual pull-on diaper can not be helpful in making the foregoing garment.

[0003] It is a principal object of this invention to provide an upper garment adapted to be disposable immediately after a single use and a process enabling such garment to be mass-produced at a high productivity per unit time.

SUMMARY OF THE INVENTION

[0004] The object set forth above is achieved, according to an aspect of this invention, by a disposable upper garment having a neckline and a hemline defined by upper and lower ends of the upper garment, respectively, and a pair of sleeves extending downward from transversely opposite ends of the upper end toward the lower end of the upper garment.

[0005] In such upper garment, this invention is characterized by that the upper garment comprises right- and left-hand sleeve members being identical to each other in shape as well as in size and having arm holes at transversely opposite ends of the upper end and wrist-openings in the vicinity of the lower end, a front body member intended to cover a belly region of an upper garment wearer having transversely opposite side edges extending between the upper and lower ends and a pair of arm holes formed at the transversely opposite ends, and a rear body member intended to cover a back region of the upper garment wearer having transversely opposite side edges extending between the upper and lower ends and a pair of arm holes formed at the transversely opposite ends of the upper end; and peripheries of the arm holes defined by the upper ends of the pair of sleeve members are bonded to peripheries of the associated arm holes formed at the transversely opposite ends of the front and rear body members, and the front and rear body members are bonded together along the transversely opposite side edges of these body members with narrow marginal regions of these side edges left free, and along portions of the upper end defined between the neckline and the pair of sleeve members.

[0006] According to one preferred embodiment of this invention, the rear body member is cut along a line extending between the upper and lower ends to bisect a transverse dimension between the transversely opposite side edges of the rear body member.

[0007] According to another preferred embodiment of this invention, the pair of sleeve members and/or the front and rear body members are made of a nonwoven fabric.

[0008] The object set forth above is achieved, according to another aspect of this invention, by a process for making disposable upper garment comprising the steps of:

(a) continuously feeding forward front and rear body sheets in the longitudinal direction, each of the front and rear body sheets having upper and lower surfaces, transversely opposite side edges extending in the longitudinal direction and a center line extending in the longitudinal direction to bisect a transverse dimension between the transversely opposite side edges, and coating the upper surface of the front body sheet and the lower surface of the rear body sheet with adhesive along first bonding zones extending between the transversely opposite side edges in the transverse direction intersecting the center lines;

(b) cutting the front and rear body sheets along a neckline and thereby cutting portions off from the front and rear body sheets;

(c) placing the pair of sleeve members each having the arm hole lying ahead in the longitudinal direction and the wrist-opening lying behind in the longitudinal direction upon the front body sheet in such a manner that the peripheries of the respective arm holes defined by the upper ends of the respective sleeve members coincide the first bonding zones extending from the transversely opposite ends of the neckline cutting line of the front body sheet and then bonding the pair of sleeve members to the front body sheet along the first bonding zones by means of adhesive coating the first bonding zones;

(d) coating the front body sheet and/or the rear body sheet with adhesive along second bonding zones extending along the transversely opposite side edges of the body sheets;

(e) the upper surface of the front body sheet is placed upon the lower surface of the rear body sheet in such a manner that the center lines of the front and rear body sheets coincide with the first

bonding zones, the front and rear body sheets are bonded to each other along the second bonding zones by means of adhesive coating the second bonding zones, and bonding peripheries of the arm holes defined by the upper ends of the pair of sleeve members are bonded to the rear body sheet along the first bonding zones by means of adhesive coating the first bonding zones; and

(f) cutting the front and rear body sheets along first cutting lines extending inside the neckline cutting line slightly ahead of the first bonding zones to the transversely opposite side edges of the front and rear body sheets and along the second cutting line extending in the transverse direction between the transversely opposite side edges behind the wrist-openings of the right- and left-hand sleeve members.

[0009] According to one preferred embodiment of the process of this invention, on the step (a) of coating the first bonding zones with adhesive, the first bonding zones get nearer to an imaginary line intersecting the center lines at right angles as the first bonding zones extend forward in the longitudinal direction.

[0010] According to another preferred embodiment of the process of this invention, the step (a) of coating the first bonding zones with adhesive comprise a sub-step of cutting the rear body sheet along the center line of the rear body sheet.

BRIEF DESCRIPTION OF THE DRAWING

[0011]

Fig. 1 is a perspective view of a disposable upper garment made in accordance with the principal of this invention;

Fig. 2 is an exploded plan view of the disposable upper garment shown in Fig. 1;

Fig. 3 is a view similar to Fig. 1 showing a disposable upper garment as an alternative embodiment of this invention as viewed from its rear side; and

Fig. 4 is a diagram schematically illustrating a process for making the disposable upper garment of this invention.

DESCRIPTION OF THE BEST MODE FOR WORKING OF THE INVENTION

[0012] A disposable upper garment and a process for making the same according to this invention will be described hereunder, by way of example, in more details with reference to the accompanying drawings.

[0013] Fig. 1 is a perspective view of a disposable upper garment 1 made in accordance with a principle of this invention. Referring to Fig. 1, the upper garment 1 comprises front and rear body members 2, 3 sealed with each other, and right- and left-hand sleeve members 4, 4 sealed with the front and rear body members 2, 3, respectively, along right- and left-hand arm holes 2e, 3e of the front and rear body members 2, 3, which are formed at the transversely opposite sides of the upper end. The upper garment 1 is formed along its upper end with a neckline 5 intended between the right- and left-hand sleeve members 4, 4 and along its lower end with a hemline 6 so that head and trunk of a wearer may freely pass through the neckline 5 and the hemline 6, respectively, when the upper garment 1 is put on and taken off as a pull over upper garment. Upper ends of the front and rear body members 2, 3 except the neckline 5 cooperate with upper ends of the right- and left-hand sleeve members 4, 4 to form a pair of shoulder regions.

[0014] Fig. 2 is an exploded plan view of the upper garment 1 shown in Fig. 1. As shown, the right- and left-hand sleeve members 4, 4 are arranged on both side of the front and rear body members 2, 3. The front and rear body members 2, 3 have right and left side edges 2c, 2d; 3c, 3d extending in parallel to each other in longitudinal direction, upper and lower ends 2a, 2b; 3a, 3b extending in transverse direction intersecting the longitudinal direction at right angles and center lines Y1, Y2 extending in the longitudinal direction to bisect respective transverse dimensions between the right and left side edges 2c, 2d; 3c, 3d. The front and rear body members 2, 3 are formed in the vicinity of their upper ends 2a, 3a with neckline 5 defined by a pair of arcs about the respective Center lines Y1, Y2 extending from the upper ends 2a, 3a toward the lower ends 2b, 3b. Between transversely opposite ends of the neckline 5 and the right and left side edges 2c, 2d; 3c, 3d, arm holes 2e, 3e are formed, respectively.

[0015] The right- and left-hand sleeve members 4, 4 are tubular members extending from arm holes 4a, 4a contiguous to the upper end of the upper garment 1 to wrist-opening 4b, 4b lying substantially at the same level as the lower end of the upper garment 1. The wearer's arms can freely pass through these arm holes and cuffs when the upper garment 1 is put on and taken off. Each of the sleeve members 4, 4 is formed from a rectangular sheet having inner and outer edges extending in parallel to each other in the longitudinal direction and upper and lower edges extending in the transverse direction which intersects the longitudinal direction. The sheet may be folded back onto itself so as to bisect its transverse dimension between the inner and outer edges and bonded together along the inner and outer edges, leaving narrow marginal regions of these edges free, to form the tubular sleeve member 4.

[0016] Peripheries of the arm holes 4a, 4a defining the upper ends of the right- and left-hand sleeve sheets 4, 4 are bonded to peripheries of the corresponding arm holes 2e, 3e of the front and rear body members 2, 3.

The front and rear body members 2, 3 are placed one upon another with center lines Y1, Y2 of these body members 2, 3 put in mutual coincidence and bonded together along parts of their upper ends defined between the neckline 5 and the right- and left-hand sleeve members 4, 4, on one hand, and along their right and left side edges 2c, 2d; 3c, 3d, leaving narrow marginal regions of these side edges free, on the other hand.

[0017] Though not shown in detail, the transversely opposite side edges 2c, 2d; 3c, 3d of the front and rear body members 2, 3 as well as the transversely opposite side edges of the respective sleeve members 4, 4 are bonded together with these side edges folded back inwardly of the body members 2, 3 and of the sleeve members 4, 4, respectively, Consequently, the bonded regions are not exposed outwardly of the body members 2, 3 as well as of the sleeve members 4, 4.

[0018] Fig. 3 is a view similar to Fig. 2, showing an alternative embodiment of a disposable upper garment according to this invention. This upper garment 1 is similar to the upper garment 1 of Fig. 1 except that the rear body sheet 3 is cut along a full length of its center line Y2 to divide the rear body sheet 3 in separable halves. These separable halves of the rear body sheet 3 are provided with a tape fastener 8 and a target tape 9 to which the tape fastener 8 is detachably fastened, respectively. These separable halves of the rear body sheet 3 are also provided on their outer surfaces with a pair of braid members 7, 7, respectively.

[0019] It is also possible to provide the front and rear body members 2, 3 with elastic members bonded under tension thereto and to provide the right- and left-hand sleeve members 4, 4 adjacent their wrist-openings 4b, 4b with elastic members bonded under tension thereto both extending circumferentially of these sleeve members. Contractile force of these elastic members ensures a good fitting of the upper garment 1 around the wearer's trunk and arms, whereby preventing undesirable shift or movement of the upper garment 1 put on its wearer.

[0020] The front and rear body members 2, 3 and/or the right- and left-hand sleeve members 4, 4 are preferably made of a nonwoven fabric formed by thermoplastic fibers such as a spun bond nonwoven fabric or a melt blown nonwoven fabric. Taking account of moisture-holding property and rigidity to be improved, particularly preferable stock material for these members includes a spun bond, point bond or melt blown nonwoven fabric having a basis weight of 50 ~ 100 g/m^2 each containing dependently rayon, nylon, pulp or a mixture thereof. Useful stock material for these sheets further includes a nonwoven fabric made porous to improve its moisture-permeability, a nonwoven fabric embossed to generate irregularity and thereby to improve its cushioning property or nonwoven fabric treated to have an elasticity.

[0021] Fig. 5 is a schematic diagram illustrating, by way of example, sequential steps of the process for making the disposable upper garment of this invention in a side view (1) and in a plan view (2), (4). So far as first step (a) ~ fourth step (d) are concerned, illustration and description of the rear body sheet 3 is eliminated to avoid complexity. Along a line comprising first step (a) ~ sixth step (i), the upper garment 1 is made from front and rear body members 2, 3 and right- and left-hand sleeve members 4, 4 each having a tubular configuration.

[0022] The front and rear body members 2, 3 comprise a pair of nonwoven fabric sheets each having a given width. These sheets have upper and lower surfaces, transversely opposite side edges 2c, 2d; 3c, 3d, and center lines Y1, Y2 extending in the longitudinal direction to bisect respective transverse dimensions between the transversely opposite side edges 2c, 2d; 3c, 3d. The front and rear body sheets 2, 3 are identical to each other so far as the dimensions between the transversely opposite side edges 2c, 2d; 3c, 3d are concerned.

[0023] The right- and left-hand sleeve members 4, 4 are formed from a pair of nonwoven fabric sheets each having a given width by folding these sheets along lines bisecting their transverse dimensions back onto themselves and bonding folded back halves of the same sheets together along the transversely opposite side edges of the respective sheets. The sleeve members 4, 4 are fed with the arm holes 4a, 4a ahead and the cuffs 4b, 4b behind. The front and rear body sheets 2, 3 are fed at the same sheet feeding rate as the sheet feeding rate for the right- and left-hand sleeve members 4, 4.

[0024] The first step (a) is a step of continuously feeding the front body sheet 2 and the rear body sheet 3 (not shown) forward in the longitudinal direction, cutting the rear body sheet 3 along the center line Y2 and coating first bonding zones B1 of the front and rear body sheets 2, 3 with adhesive.

[0025] The second step (b) is a step of cutting the front body sheet 2 and the rear body sheet 3 (not shown) along a neckline cutting line S1 to cut off predetermined portions from these body sheets 2, 3.

[0026] The third step (c) is a step of sealing the right- and left-hand sleeve sheets 4, 4 to the front body sheet 2 along the first bonding zones B1.

[0027] The fourth step (d) is a step of coating second bonding zones B2 of the front body sheet 2 and the rear body sheet 3 (not shown) with adhesive.

[0028] The fifth step (e) is a step of sealing the front body sheet 2 with the rear body sheet 3 along the second bonding zones B2 and sealing the right- and left-hand sleeve members 4, 4 with the rear body sheet 3 along the first bonding zones B1 of the rear body sheet 3.

[0029] The sixth step (f) is a step of cutting the front and rear body sheets 2, 3 along first cutting lines S2 and along a second cutting line S3.

[0030] Though not illustrated in detail, the front and rear body sheets 2, 3 travel through the respective steps

(a) ~ (f) as rolls associated with the respective steps are driven by driving means (not shown). Similarly, the right- and left-hand sleeve members 4, 4 travel through the respective steps (a) ~ (f) as rolls associated with the respective steps are driven by driving means or as a conveyor belt rotated by driving means.

[0031] On the first step (a), the front body sheet 3 stored on a delivery roll 100 is continuously fed forward in the longitudinal direction. Adhesive coating means 101 located downstream of the delivery roll 100 coat the upper surface of the front body sheet 2 along the first bonding zone B1 extending transversely of the center line Y1 between the transversely opposite side edges 2c, 2d with adhesive. While the first bonding zones B1 are illustrated to get nearer to an imaginary line Y3 intersecting the center line Y1 at right angles as the first bonding zones B1 extend forward in the longitudinal direction, it is also possible to provide the first bonding zones B1 extending in parallel to the imaginary line Y3.

[0032] On the second step (b), cutter means 102 cut the front body sheet 2 along the neckline cutting line S1 partially coinciding with the first bonding zones B1 and describing a convex arc about the center line Y1 of the front body sheet 2 toward the transversely opposite side edges 2c, 2d and thereby cut off a portion 5 from the front body sheet 2.

[0033] On the third step (c), the right- and left-hand sleeve members 4, 4 are fed forward at predetermined intervals in the longitudinal direction. The right- and left-hand sleeve members 4, 4 are placed on the upper surface of the front body sheet 2 between the center line Y1 and the transversely opposite side edges 2c, 2d, respectively. At this time point, the peripheries of the arm holes 4a, 4a defining the upper ends of the right- and left-hand sleeve members 4, 4 coincide with the first bonding zones B1 extending outward from the transversely opposite ends of the neck-opening cutting line S1 of the front body sheet 2. Along the first bonding zones B1, the right- and left-hand sleeve members 4, 4 are bonded to the front body sheet 2 by means of adhesive coating the first bonding zones B1. When the conveyor belt is used as transport means, the right- and left-hand sleeve members 4, 4 are separated off from the conveyor belt by a transfer device including vacuum means and placed upon the upper surface of the front body sheet 2.

[0034] On the fourth step (d), adhesive coating means 103 coat the upper surface of the front body sheet 2 with adhesive along second bonding zones B2 extending along the transversely opposite side edges 2c, 2d.

[0035] On the fifth step (e), the front and rear body sheets 2, 3 are placed one upon another in such a manner that the center lines Y1, Y2 of these sheets 2, 3 coincide with each other and the upper surface of the front body sheet 2 faces the lower surface of the rear body sheet 3. The front and rear body sheets 2, 3 are bonded to each other by means of adhesive coating the second bonding zones B2 of these sheets 2, 3. The peripheries of the arm holes 4a defining the upper ends of the right- and left-hand sleeve members 4, 4 to the lower surface of the rear body sheet 3 by means of adhesive coating the first bonding zones B1 of the rear body sheet 3.

[0036] As illustrated in Fig. 5, the rear body sheet 3 joining the front body sheet 2 on the fifth step (e) has already been coated with adhesive along its first bonding zones B1 and cut along its center line Y2 on the first step (a). It is possible to eliminate a sub-step of cutting the rear body sheet 3 from the first step (a). On the second step (b), the portion 5 is cut off from the rear body sheet 3 along the neckline cutting line S1 and, on the fourth step (d), the lower surface of the rear body sheet 3 is coated along its transversely opposite side edges 3c, 3d with adhesive to form the second bonding zones B2. While both the front body sheet 2 and the rear body sheet 3 are coated with said adhesive to form the second bonding zones B2 in the illustrated case, it will be obviously possible to coat either the front body sheet 2 or the rear body sheet 3 and thereby to simplify the step of forming the second bonding zones B2.

[0037] On the sixth step (f), the front and rear body sheets 2, 3 are cut by cutter means 104 along the first cutting lines S2 extending inside the neckline cutting line S1 and then slightly ahead of the respective first bonding zones B1 to the transversely opposite side edges 2c, 2d; 3c, 3d of the front and rear body sheets 2, 3 and along the second cutting line S3 extending in the transverse direction between the transversely opposite side edges 2c, 2d; 3c, 3d behind the wrist-openings 4b, 4b of the right- and left-hand sleeve members 4.

[0038] Immediately after worked through these steps, the upper surface of the front body sheet 2 and the lower surface of the rear body sheet 3 defining the outer surface of the upper garment 1 in its actual use lie inside the upper garment 1. This advantageously prevents extraneous substances from clinging to the outer surface of the upper garment 1 during packaging of the upper garment 1. For actually wearing, the upper garment 1 immediately after unpacked may be turned over so that the upper surface of the front body sheet 2 and the lower surface of the rear body sheet 3 define the outer side of the upper garment 1.

[0039] Bonding of the front and rear body sheets 2, 3 as well as of the right- and left-hand sleeve members 4, 4 may be carried out using suitable adhesive agent such as hot melt adhesive. Bonding of the sheets may be achieved in continuous or intermittent mode. Cutting of the sheets 2, 3 may be carried out not only using a cutting die but also using the other cutting technique utilizing laser rays or ultrasonic wave.

[0040] The system described heretofore intends to improve a productivity of the upper garment 1 by continuously running and automating the first step (a) ~ the sixth step (f). These steps (a) ~ (f) may be operatively associated with controller means (not shown) enabling

such automation to be smoothly achieved. For example, these controller means may include controller means serving to correct a misalignment between the center lines Y1, Y2 of the body sheets 2, 3 possibly occurring when these sheets 2, 3 are placed one upon another and controller means serving to correct the actual feed rate of the front and rear body sheet 2, 3 and the right- and left-hand sleeve members 4, 4 possibly deviating from the predetermined feed rate thereof.

[0041] The controller means serving to correct the misalignment between the center lines Y1, Y2 is preferably provided between the delivery roll 100 and the adhesive coating means 101 on the first step (a).

[0042] The disposable upper garment according to this invention has its body sheets and sleeve members bonded together by means of adhesive instead of stitched together and therefore can be produced at a low cost. Particularly when a nonwoven fabric is used as stock material, the requirements for the upper garment to be disposable after a single use can be satisfactorily met.

[0043] The process according to this invention for making the disposable upper garment improves a productivity per unit time by continuously running and automating the sequential steps of the process.

Claims

1. A disposable upper garment having a neckline and a hemline defined by upper and lower ends of the upper garment, respectively, and a pair of sleeves extending downward from transversely opposite ends of said upper end toward said lower end of the upper garment, said disposable upper garment being characterized by that:

   said upper garment comprises right- and left-hand sleeve members being identical to each other in shape as well as in size and having arm holes at transversely opposite ends of said upper end and wrist-openings in the vicinity of said lower end, a front body member intended to cover a belly region of a an upper garment wearer having transversely opposite side edges extending between said upper and lower ends and a pair of arm holes formed at the transversely opposite ends, and a rear body member intended to cover a back region of the upper garment wearer having transversely opposite side edges extending between said upper and lower ends and a pair of arm holes formed at the transversely opposite ends of said upper end; and

   peripheries of the arm holes defined by the upper ends of said pair of sleeve members are bonded to peripheries of the associated arm holes formed at the transversely opposite ends of said front and rear body members, and said front and rear body members are bonded together along the transversely opposite side edges of these body members with narrow marginal regions of these side edges left free, and along portions of said upper end defined between said neckline and said pair of sleeve members.

2. A disposable upper garment according to Claim 1, wherein said rear body member is cut along a line extending between said upper and lower ends to bisect a transverse dimension between the transversely opposite side edges of said rear body member.

3. A disposable upper garment according to Claim 1 or 2, wherein said pair of sleeve members and/or said front and rear body members are made of a nonwoven fabric.

4. A process for making a disposable upper garment comprising the steps of:

   (a) continuously feeding forward front and rear body sheets in the longitudinal direction, each of said front and rear body sheets having upper and lower surfaces, transversely opposite side edges extending in said longitudinal direction and a center line extending in said longitudinal direction to bisect a transverse dimension between said transversely opposite side edges, and coating the upper surface of said front body sheet and the lower surface of said rear body sheet with adhesive along first bonding zones extending between said transversely opposite side edges in the transverse direction intersecting said center lines;
   (b) cutting said front and rear body sheets along a neckline cutting line and thereby cutting portions off from said front and rear body sheets;
   (c) placing said pair of sleeve members each having the arm hole lying ahead in said longitudinal direction and said wrist-opening lying behind in said longitudinal direction upon said front body sheet in such a manner that the peripheries of the respective arm holes defined by the upper ends of the respective sleeve members coincide said first bonding zones extending from the transversely opposite ends of said neckline cutting line of said front body sheet and then bonding said pair of sleeve members to said front body sheet along said first bonding zones by means of adhesive coating said first bonding zones;
   (d) coating said front body sheet and/or said rear body sheet with adhesive along second

bonding zones extending along said transversely opposite side edges of said body sheets;

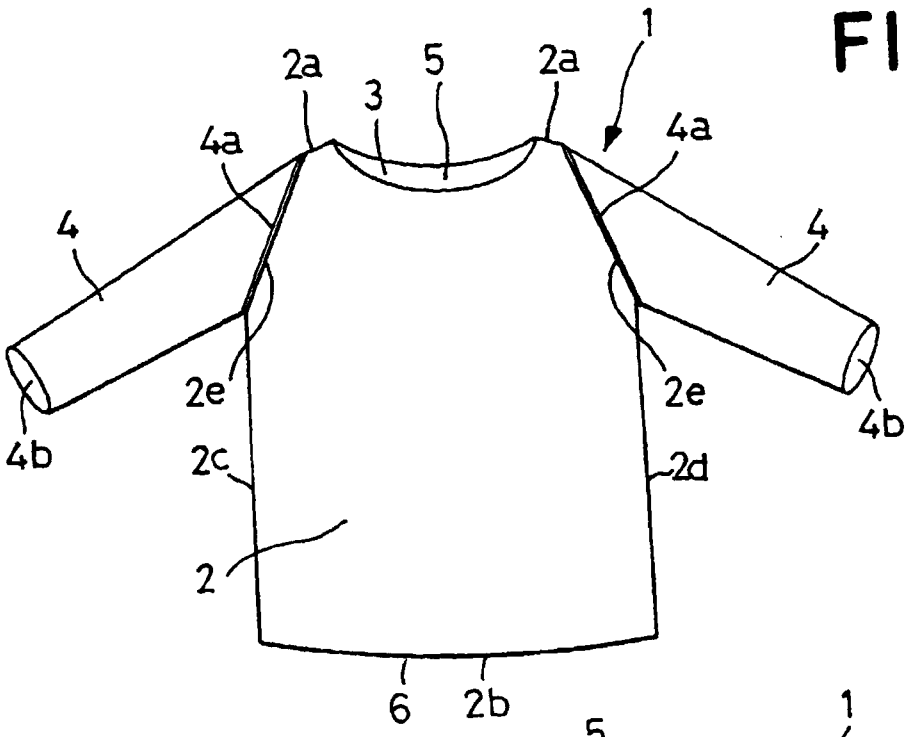
(e) the upper surface of said front body sheet is placed upon the lower surface of said rear body sheet in such a manner that the center lines of said front and rear body sheets coincide with the first bonding zones, said front and rear body sheets are bonded to each other along said second bonding zones by means of adhesive coating said second bonding zones, and bonding peripheries of the arm holes defined by the upper ends of said pair of sleeve members are bonded to said rear body sheet along said first bonding zones by means of adhesive coating said first bonding zones; and

(f) cutting said front and rear body sheets along first cutting lines extending inside the neckline cutting line slightly ahead of said first bonding zones to the transversely opposite side edges of the front and rear body sheets and along the second cutting line extending in the transverse direction between the transversely opposite side edges behind the wrist-openings of the right- and left-hand sleeve members.

5. A process according to Claim 4, wherein, on the step (a) of coating said first bonding zones with adhesive, said first bonding zones get nearer to an imaginary line intersecting said center lines at right angles as said first bonding zones extend forward in said longitudinal direction.

6. A process according to Claim 4 or 5, wherein the step (a) of coating said first bonding zones with adhesive comprise a sub-step of cutting said rear body sheet along the center line of said rear body sheet.

FIG.1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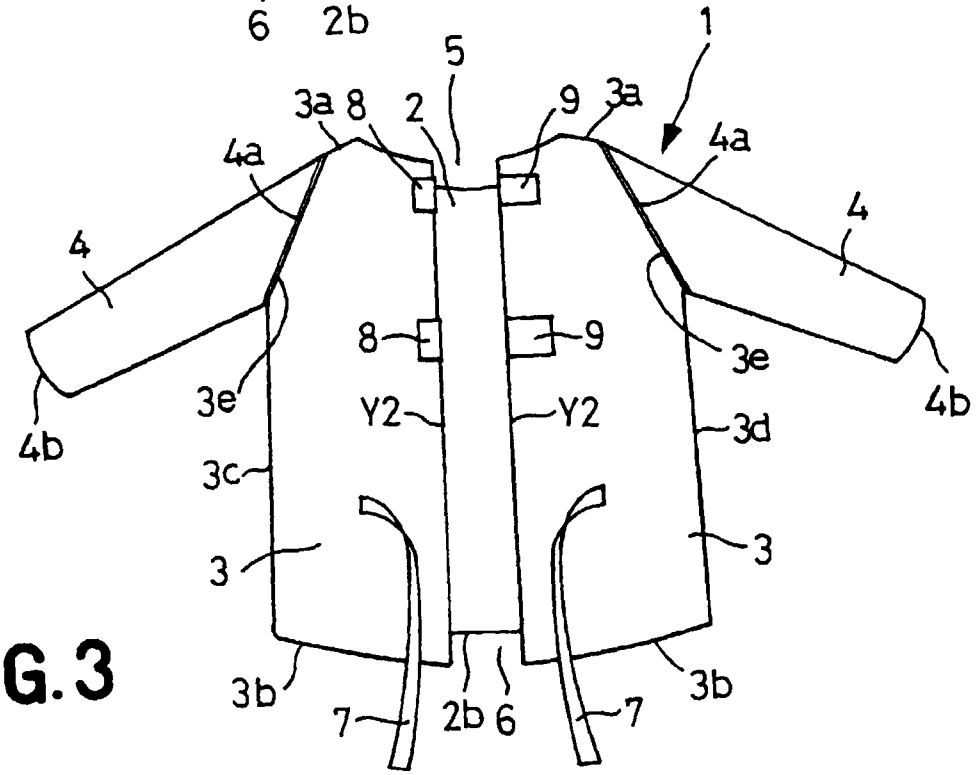
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FIG.3

FIG.2

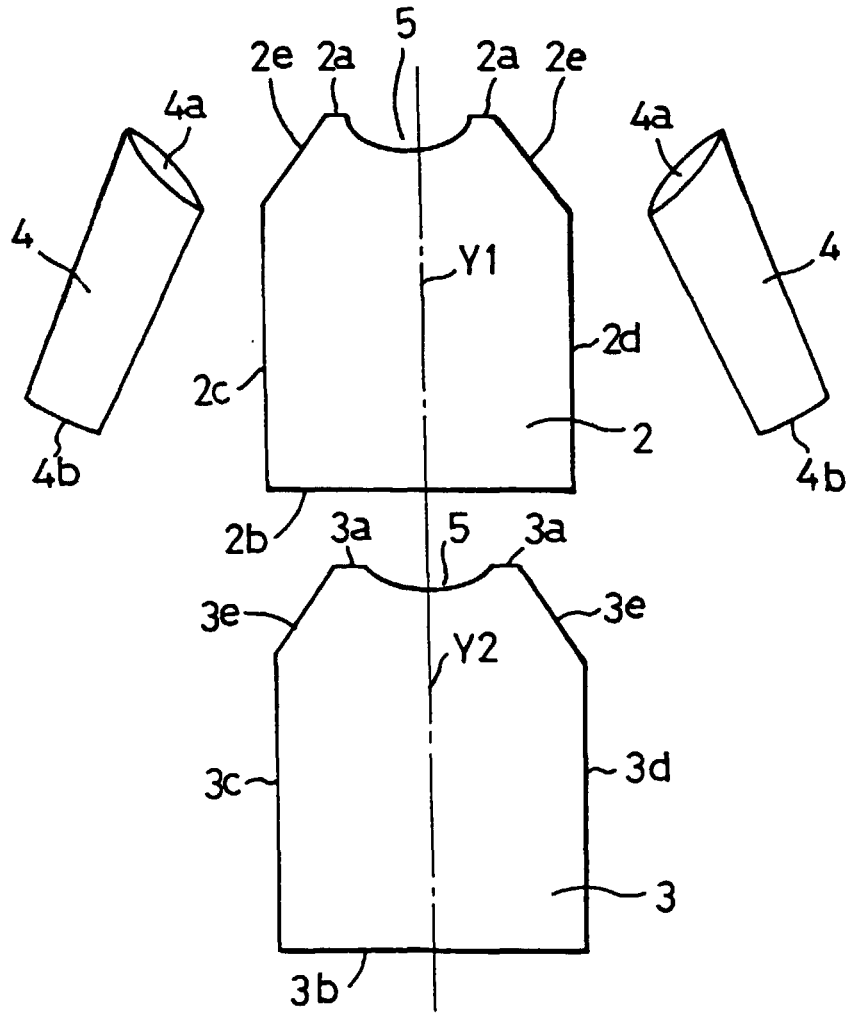
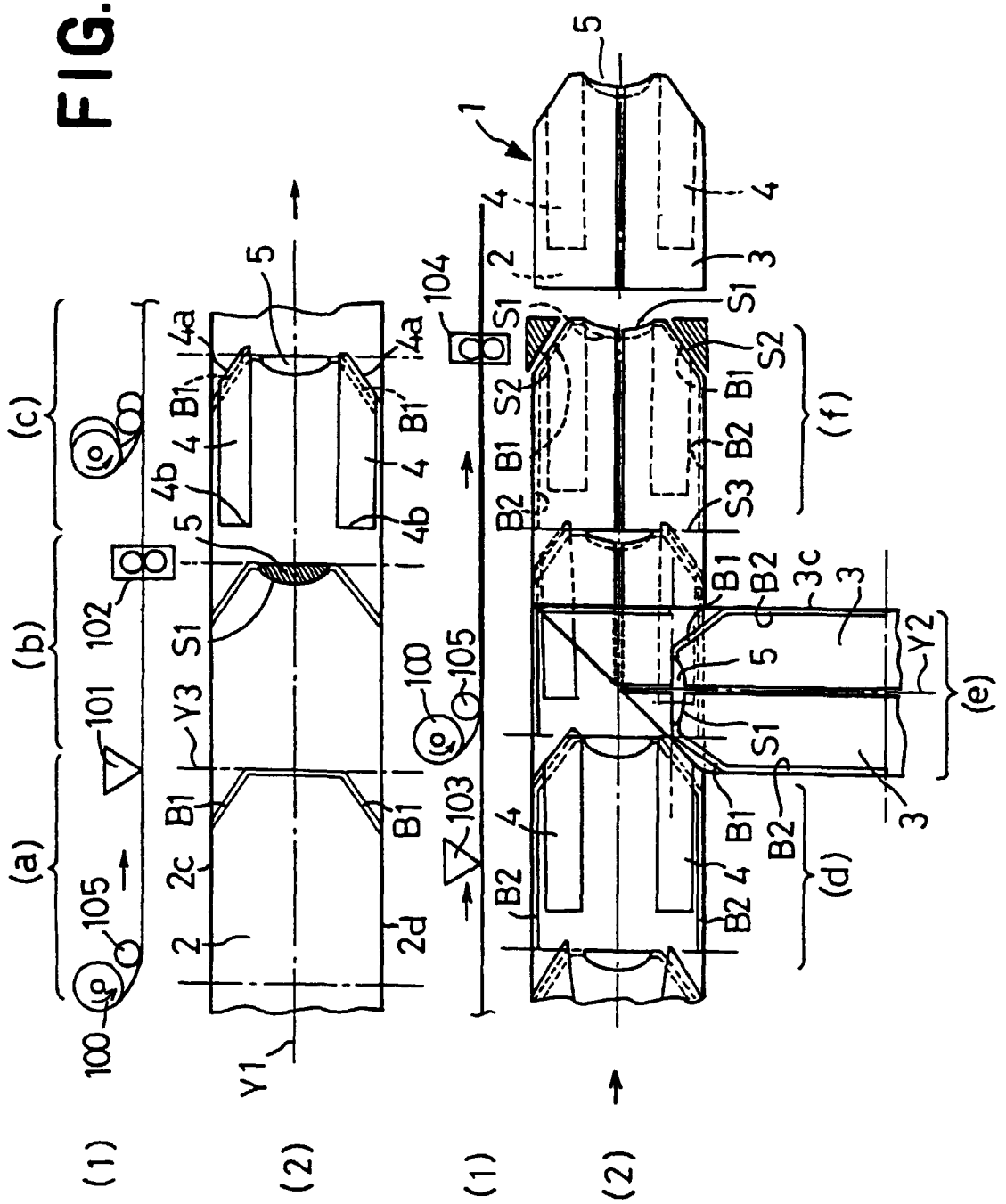


FIG.4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Y3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/06952

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] A41D13/12

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)
Int.Cl[7] A41D13/12, 1/00, 13/00, 31/00, A41H43/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1929-1996 Jitsuyo Shinan Toroku Koho 1996-1999
Kokai Jitsuyo Shinan Koho 1971-1999 Toroku Jitsuyo Shinan Koho 1994-1999

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	JP, 8-13211, A (AZWELL, INC.), 16 January, 1996 (16.01.96)	1-6
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☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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21 February, 2000 (21.02.00)	29 February, 2000 (29.02.00)
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