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54. **TITULO** PRENDA ABSORBENTE QUE TIENE UN COMPUESTO ABSORBENTE QUE SE CONFORMA
AL CUERPO

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71. **SOLICITANTE** KIMBERLY, CLARK WORLDWIDE, INC.

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1

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☐ Patente de Modelo de Utilidad.

☐ Capítulo I.

☒ Capítulo II.

2

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Número _____

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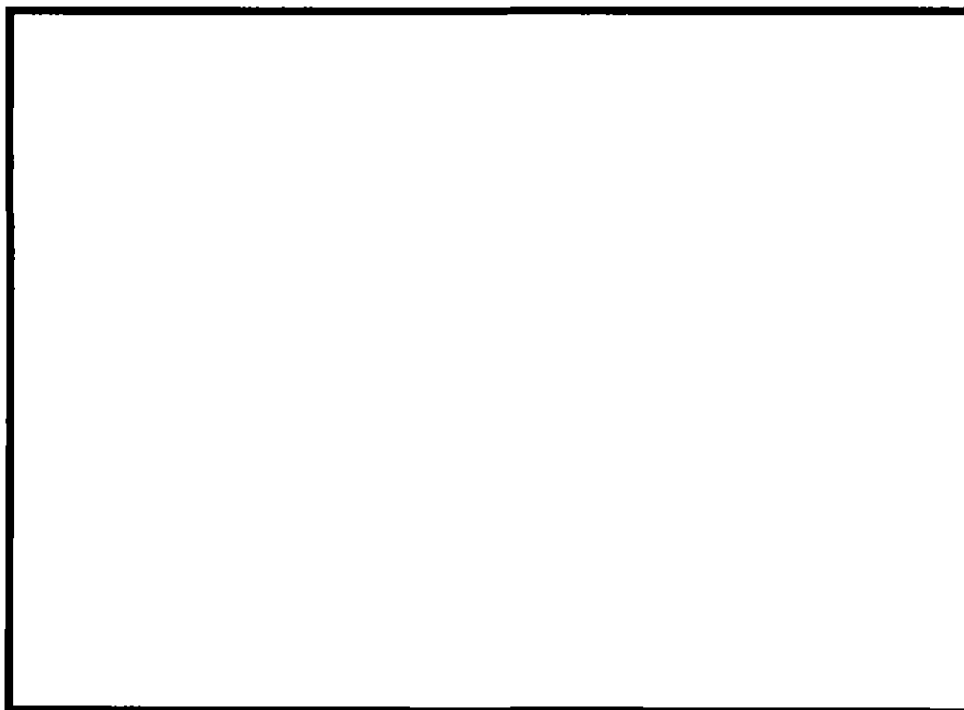
Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página.

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ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud. \$422.000
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. Protocolo No. 17397
- ☒ Documento de cesión del Inventor al solicitante o a su causante.
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☐ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☒ Otras Tarjeta de Propietarios

11 FIGURA CARACTERÍSTICA:



12. Por la concesión de la patente:

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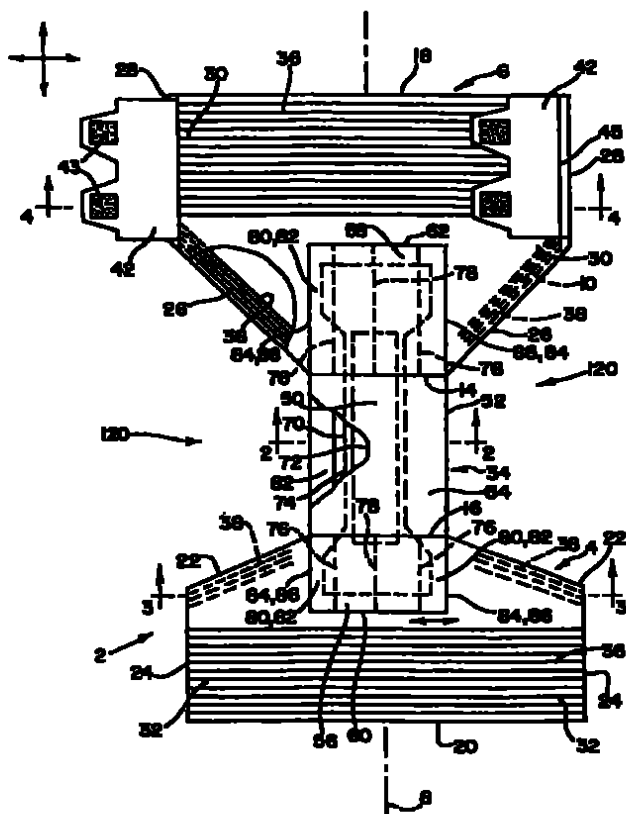
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[Continued on next page]

(54) Title: ABSORBENT ARTICLE HAVING A BODY CONFORMING ABSORBENT COMPOSITE



(57) Abstract: An absorbent garment comprises a body panel and an absorbent composite having a longitudinally extending length and a laterally extending width and comprising a backsheet, a topsheet and a retention portion disposed between the backsheet and the topsheet. The absorbent composite is connected to the body panel and comprises a side margin that is not attached to the body panel and that extends laterally outboard and terminates in a free edge. In one preferred embodiment, the free edge does not extend along the entirety of the length of the absorbent composite. Rather, the entire width of an end of the absorbent composite is secured to the body panel. Preferably, the width of the side margin along the portion of the absorbent composite overlapping the body panel is relatively constant.

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- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
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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.

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X**ABSORBENT ARTICLE HAVING A BODY CONFORMING ABSORBENT COMPOSITE****5 BACKGROUND**

The present invention relates generally to an absorbent garment, and in particular, to an absorbent garment having a body conforming absorbent composite.

Absorbent garments, and in particular disposable absorbent garments,
10 often include an absorbent composite and one or more body panels connected to the absorbent composite. Typically, the absorbent composites are secured to the body panels along the peripheral side edges of the absorbent composite. As such, the absorbent composite can reduce or otherwise affect the extensibility of the body panel, especially when it is desired to have a wider absorbent
15 composite. In addition, the absorbent composite typically is not able to conform to the body of the user independently of the body panels, and can therefore distort the panels when fitted to a user.

In other embodiments, the absorbent garment may include a top sheet and backsheet, one or both of which can form in part longitudinally extending
20 flaps. Typically, such flaps are directed inboard to form a trough and may have one or more ends thereof secured to the garment to prevent the inversion thereof. As such, the flaps do not contribute to the overall width of the absorbent composite.

25 SUMMARY

Briefly stated, in one aspect, the invention is directed to an absorbent garment comprising a body panel having a bodyside surface and an absorbent composite having a longitudinally extending length and a laterally extending width and comprising a backsheet, a topsheet and a retention portion disposed
30 between the backsheet and the topsheet. The absorbent composite is connected to the bodyside surface of the body panel and comprises a side margin that is not attached to the body panel and that extends laterally outboard and terminates

in a free edge. The absorbent composite also is preferably connected to the body panel along an entirety of the laterally extending width at a laterally extending location at an end of the absorbent composite. The side margin and free edge extends longitudinally from the laterally extending location.

5 Preferably, in one embodiment, the side margin has a relatively constant width.

In one preferred embodiment, the absorbent composite is connected to the body panel with a T-shaped attachment pattern. Also in a preferred embodiment, the absorbent composite includes laterally opposed side margins.

10 In one preferred embodiment, the side margin is formed from the top sheet. In another preferred embodiment, the side margin is formed from the topsheet and the backsheet. In one preferred embodiment, a first portion of the topsheet is folded over a second portion of the topsheet to form a folded edge that defines the free edge of the side margin. In yet another preferred embodiment, the backsheet is disposed between the first and second portions of
15 the topsheet. Portions of the side margins can include an elastic element.

In one preferred embodiment, the body panel comprises a first and second longitudinally spaced body panels. In yet another preferred embodiment, each of the first and second body panels includes a pair of laterally spaced side body panels.

20 In another aspect of the invention, a method of protecting a user from bodily exudates comprises applying the absorbent garment to the body of the user.

The present invention provides significant advantages over other absorbent garments and methods for the use and manufacture thereof. For
25 example, the unattached side margins can fold inward and follow the bodylines of the user without distorting the body panels. Moreover, the unattached side margins do not restrict the fit of the leg regions of the panels during use. In addition, the absorbent capacity of the garment can be easily changed simply by increasing the width of the absorbent composite, while at the same time
30 maintaining the width of the portion of the absorbent composite that is

connected to the body panels. As such, the width of the side margins can be increased without affecting the overall fit of the garment. In addition, the elastic elements can stand up or help seal or gasket the side margins against the user's body. At the same time, the configuration of the outwardly extending
5 side margins ensures that the side margins, especially when they incorporate a moisture barrier, does not fold over the absorbent area defined by the retention portion, especially when the side margin includes elastic elements.

The present invention, together with further objects and advantages, will be best understood by reference to the following detailed description taken in
10 conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Many of the features and dimensions portrayed in the drawings, and in particular the presentation of layer thicknesses and the like, have been
15 somewhat exaggerated for the sake of illustration and clarity.

FIGURE 1 is a plan view of a first embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 2 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 2-2 in Figure 1.

20 FIGURE 3 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 3-3 in Figure 1.

FIGURE 4 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 4-4 in Figure 1.

25 FIGURE 5 is a plan view of a second embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 6 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 6-6 in Figure 5.

FIGURE 7 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 7-7 in Figure 5.

30 FIGURE 8 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 8-8 in Figure 5.

FIGURE 9 is a plan view of a third embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 10 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 10-10 in Figure 9.

5 FIGURE 11 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 11-11 in Figure 9.

FIGURE 12 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 12-12 in Figure 9.

10 FIGURE 13 is a plan view of a fourth embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 14 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 14-14 in Figure 13.

FIGURE 15 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 15-15 in Figure 13.

15 FIGURE 16 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 16-16 in Figure 13.

FIGURE 17 is a plan view of a fifth embodiment of an absorbent garment taken from the bodyside thereof.

20 FIGURE 18 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 18-18 in Figure 17.

FIGURE 19 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 19-19 in Figure 17.

FIGURE 20 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 20-20 in Figure 17.

25 FIGURE 21 is a plan view of a sixth embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 22 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 22-22 in Figure 21.

30 FIGURE 23 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 23-23 in Figure 21.

FIGURE 24 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 24-24 in Figure 21.

FIGURE 25 is a plan view of a sixth embodiment of an absorbent garment taken from the bodyside thereof.

5 FIGURE 26 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 26-26 in Figure 25.

FIGURE 27 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 27-27 in Figure 25.

10 FIGURE 28 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 28-28 in Figure 25.

FIGURE 29 is a plan view of a seventh embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 30 is a plan view of an eighth embodiment of an absorbent garment taken from the bodyside thereof.

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DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

It should be understood that the term "longitudinal," as used herein, means of or relating to length or the lengthwise direction, and in particular, the direction running between the front and back of the user. The term "laterally," as used herein means situated on, directed toward or running from side to side, and in particular, a direction running from the left to the right of a user. The terms "upper," "lower," "inner", and "outer" as used herein are intended to indicate the direction relative to the user wearing an absorbent garment over the crotch region, while the terms "inboard" and "outboard" refer to the directions relative to a centerline 8 of the garment. For example, the terms "inner" and "upper" refer to a "bodyside," which means the side closest to the body of the user, while the terms "outer" and "lower" refer to a "garment side". The term "bodyside" should not be interpreted to mean in contact with the body of the user, but rather simply means the side that would face toward the body of the user, regardless of whether the absorbent garment is actually being worn by the user and regardless of whether there are or may be intervening layers

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between the component and the body of the user. Likewise, the term "garment side" should not be interpreted to mean in contact with the garments of the user, but rather simply means the side that faces away from the body of the user, and therefore toward any outer garments that may be worn by the user, regardless of whether the absorbent garment is actually being worn by a user, regardless of whether any such outer garments are actually worn and regardless of whether there may be intervening layers between the component and any outer garment.

Referring to FIGS. 1, 5, 9, 13, 17, 20 and 21, an absorbent garment 2 includes a first, front body panel 4 and a second, rear body panel 6. The first and second body panels each have an inner, bodyside surface 10 an outer, garment side surface and a length, which is less the overall length of the absorbent garment. Each of the first and second body panels has a first and second longitudinally opposed terminal end edges 16, 14, 20, 18, and outer side edges, including a tapered edge 22, 26 and an outboard edge 24, 28 formed along the outer periphery of laterally opposed ear portions 30, 32.

Alternatively, as shown in FIGS. 29 and 30, the front body panel 4 does not include a tapered side edge, but rather the terminal end edge 16 extends along the entire width of the body panel between the opposite outboard edges 24. It should be understood that the rear body panel can be configured in a similar fashion. Referring to FIGS. 1, 5, 9, 13, 17, 20, 21, 29 and 30, the first terminal edges 14, 16 of the first and second body panels are longitudinally spaced to form an opening 34 therebetween in the crotch region of the garment, while the second terminal edges 20, 18 of the first and second body panels form front and back waist edges respectively. A plurality, meaning two or more, of laterally extending elastic elements 36 can be secured to each of the first and second body panels. Likewise, one or more leg elastic elements 38 can be secured along the tapered side edge of the body panels to form a gasket with the leg of the user.

For example, as shown in FIGS. 1-4, each panel can be made of an elasticized composite panel material comprising two non-woven substrates 40

with the plurality of elastic strands 38, 36 sandwiched therebetween. The elastic strands are positioned in the waist regions and along the leg perimeters. A portion of the leg elastic elements 38 can extend under a side margin of an absorbent composite 50. The placement of the panel leg elastic elements further inward along the side edge provides for improved fit and performance of the garment.

In an alternative embodiment, shown in FIG. 21, an absorbent composite 50 extends longitudinally along the entire extent of the garment from one end 116 to the other end 118 thereof. A pair of front, side body panels 108 have inboard edges 180 that are secured to opposite side regions of the absorbent composite, preferably on the bodyside thereof, adjacent one end thereof and inboard from a peripheral side edge 52 of the absorbent composite. Likewise, a pair of rear, side body panels 110 have inboard edges 184 that are secured to opposite side regions 186 of the absorbent composite, preferably on the bodyside thereof, adjacent the opposite end thereof and inboard from the peripheral side edge 152. The body panels 108, 110 extend laterally outward from the absorbent composite and form ear portions 112, 114 having outboard edges 188, 190. It should be understood that the absorbent composite could alternatively be secured to the garment side of the body panels.

Referring to FIGS. 1, 5, 9, 13, 17 and 21, fastening tabs 42 are attached and extend laterally from the outboard edge 28, 190 of the rear body panels from an attachment location 45. It should be understood that the fastening tabs could be affixed to the front body panels or to both the front and rear body panels. For the purposes of illustration, the right side tab 42 is shown as being folded in during manufacture, while the left side tab 42 is shown as being extended outboard during use. The fastening tabs can be made of a hook and loop combination, such as a VELCRO® fastening system, or can have adhesive or other bonding agents applied to one surface thereof. Various hook configurations are described in U.S. Patent No. 5,845,375 to Miller et al., U.S. Patent No. 6,132,660 to Kampfer, U.S. Patent No. 6,000,106 to Kampfer, U.S. Patent No. 5,868,987 to Kampfer, U.S. Patent No. 4,894,060 to

Nestegard, and U.S. Patent No. 6,190,594 B1 to Gorman, the entire disclosures of which are incorporated by reference herein. Some examples of suitable hook fasteners are the various CS600 hook fasteners manufactured by Minnesota Mining and Manufacturing Co., St. Paul Minn.

5 As shown in FIG. 1, the tab 42 can include one or more attachment pads 43. Alternatively, the fastening tabs can include buttons, snaps, ties or other known fastening devices. The tabs can be secured to the body panel with adhesive bonds, sonic bonds, thermal bonds, pinning, stitching or other known types of attachment.

10 When the absorbent garment is secured to the user, the fastening tabs 42 secured to the body panels 6, 110 on one end of the absorbent composite engage or are otherwise connected to the body panels 4, 108 on the opposite end of the garment. Alternatively, a landing member, which is particularly suited for engaging the fastening tabs and in particular the attachment pads, can be
15 disposed on the body panel. For example, a pattern-unbonded material, as disclosed for example in U.S. Patent No. 5,858,515 to Stokes, which is hereby incorporated by reference, is particularly well-suited for engaging a hook material. Other landing materials can be incorporated that are suitable for engaging adhesives and the like. When secured in this way, openings 120 are
20 formed on each side of the absorbent composite with the peripheral edge 52, 152 of the absorbent composite further defining the opening along the crotch region of the garment. When secured, the front and rear body panels 108, 110 form opposite side body panels.

 It should be understood that the outboard edges 24, 28, 188, 190 of the
25 front and rear body panels could be connected, for example by bonding or sewing, to create a seam of a pant garment. For example, the embodiments of FIGS. 29 and 30 are shown without fastening tabs, wherein the outboard edges 24 and 28 are secured to form a seam. However, it should be understood that fastening tabs could be incorporated into those embodiments. Alternatively, the
30 front and rear body panels can be formed integrally, for example as a single side panel attached to opposite ends 116, 118 of the absorbent composite, or as

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one panel extending around the waist and hips of the user. In yet another alternative embodiment, the outboard edges can be connected to create a seam in combination with fastening tabs, which can be used for example and without limitation to secure the body panels across a line of weakness, such as a perforation. The line of weakness can be formed for example along a breakable seam between the front and rear body panels, or along a length of one or both of the front and rear body panels.

In particular aspects of the invention, either or all of the body panels may be composed of a wide range of materials with various basis weights and properties. For example, the body panel material may include knitted or other woven fabrics, nonwoven fabrics, polymer films, laminates, and the like, as well as combinations thereof. Preferably, the body panels are made of an elastic material, wherein the term "elastic" means capable of recovering the size and shape thereof after deformation, and/or exhibiting a retractive force.

In the various configurations of the invention, the basis weight of the body panel material can be at least a minimum of about 10 g/m^2 . Alternatively, the basis weight can be at least about 20 g/m^2 , and optionally, can be at least about 40 g/m^2 to provide improved benefits. In further aspects, the basis weight of the body panel material can be not more than a maximum of about 100 g/m^2 . Alternatively, the basis weight can be not more than about 80 g/m^2 , and optionally, can be not more than about 60 g/m^2 to provide improved performance.

In the differing configurations of the invention, the body panel material may be substantially permeable to air or substantially impermeable to air. The body panel material also may be substantially liquid-permeable or substantially liquid-impermeable. In particular arrangements, the body panel material may be substantially nonelastomeric. In other aspects, the body panels can include an elastomeric material which is elastomerically stretchable at least along the lateral article width. Examples of such elastomeric materials can include a neck-bonded-laminate (NBL), a stretch-bonded-laminate (SBL), a necked-thermal laminate, or the like, as well as combinations thereof. Such laminates

can provide an improved combination of cloth-like feel and elastomeric stretchability. The body panels can be composed of materials that are elastic or elastomeric and exhibit biaxial stretch characteristics or MD/CD stretch characteristics, or that are extensible composites.

5 In desired configurations, the elastomeric body panel material can provide an elastomeric, stretch elongation which is at least about 20%, and desirably is at least about 50%. Alternatively, the stretch elongation can be at least about 75%, and optionally, can be at least about 100% to provide improved performance. In other aspects, the elastomeric stretch elongation can
10 be not more than about 400% and desirably can be not more than about 200%. Alternatively, the stretch elongation can be not more than about 300%, and optionally can be not more than about 250% to provide improved performance.

The percentage of elastomeric stretch or other elongation can be determined in accordance with the following formula: $100 * (L - L_0)/L_0$;

15 where: L = stretched length,
 L_0 = initial length,

In addition, the amount of stretch elongation is determined under an applied tension force of 250 gram-force per inch of width measured perpendicular to the direction of the applied tension. Various configurations
20 and materials of the body panels are further shown and described in U.S. Patent No. 6,132,410 directed to a "Disposable Garment Having Dryness Barriers With Expandable Attachment To An Absorbent," the entire disclosure of which is hereby incorporated herein by reference.

The body panels also can be made of extensible materials, or
25 combinations of elastomeric and extensible materials. It should be readily appreciated that each of the individual body panels may be composed of different materials, or of substantially the same material.

The term extensible means capable of being extended, and that it provides a selected elongation when subjected to an applied tensile force. The
30 body panel also is preferably capable of providing a selected, sustained deformation when subjected to an applied tensile force and then allowed to relax

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for a selected time period beginning immediately after removal of the tensile force. Preferably the sustained deformation is substantially permanent deformation. The selected elongation and sustained deformation preferably occur at least along the lateral cross-direction of the garment, although it should be understood that it also could occur along the longitudinal direction, or both. Various extensible materials, and other acceptable materials that can be used for the body panels and the absorbent composite, which may include without limitations a retention portion, a topsheet and a backsheet, are described in U.S. Application S/N 09/249,434 filed February 12, 1999, entitled Expandable Cover Garment, the entire disclosure of which is hereby incorporated herein by reference.

Referring again to FIGS. 1-4, the absorbent composite 50 has first and second longitudinally opposed end regions 56, 58 and first and second longitudinally-opposed terminal end edges 60, 62. The absorbent composite includes a substantially liquid permeable topsheet 64, or liner, and a substantially liquid impermeable backsheet 68, or barrier layer. A retention portion 70 is disposed or sandwiched between the topsheet and the backsheet, which are connected, at least along their peripheral edges. The absorbent composite, and in particular the retention portion, can be made in many different shapes, including rectangular and hour-glass shapes.

The topsheet and backsheet can be minimally attached, e.g. at the peripheral edges, or they can be attached across substantially the entire surface area thereof. The topsheet and backsheet can be joined for example with adhesive bonds, sonic bonds, thermal bonds, pinning, stitching or any other attachment techniques known in the art, as well as combinations thereof. For example, a uniform continuous layer of adhesive, a patterned layer of adhesive, a sprayed pattern of adhesive or any array of lines, swirls or spots of construction bonds may be used to join the topsheet and backsheet, or any of the other components described herein. Additional layers, including for example, a surge layer 72, can also be incorporated into the absorbent composite. Preferably, the surge layer does not run the entire length of the

absorbent composite and is shorter than the retention portion. In alternative configurations, the topsheet is indirectly joined to the backsheet by affixing the topsheet to intermediate layers, such as the surge layer or retention portion, which in turn is affixed to the backsheet.

5 The topsheet 64 presents a body-facing surface that is compliant, soft-feeling, and non-irritating to the wearer's skin. Further, the topsheet 64 can be less hydrophilic than retention portion 20, and is sufficiently porous to be liquid permeable, permitting liquid to readily penetrate through its thickness to reach the retention portion. A suitable topsheet layer 64 may be manufactured from a
10 wide selection of web materials, such as porous foams, reticulated foams, apertured plastic films, natural fibers (for example, wood or cotton fibers), synthetic fibers (for example, polyester or polypropylene fibers), or a combination of natural and synthetic fibers. The topsheet layer 64 is typically employed to help isolate the wearer's skin from liquids held in the retention
15 portion.

Various woven and nonwoven fabrics can be used for topsheet 64. For example, the topsheet may be composed of a meltblown or spunbonded web of the desired fibers, and may also be a bonded-carded-web. The various fabrics can be composed of natural fibers, synthetic fibers or combinations thereof.

20 For the purposes of the present description, the term "nonwoven web" means a web of fibrous material which is formed without the aid of a textile weaving or knitting process. The term "fabrics" is used to refer to all of the woven, knitted and nonwoven fibrous webs.

The topsheet fabrics may be composed of a substantially hydrophobic
25 material, and the hydrophobic material may optionally be treated with a surfactant or otherwise process to impart a desired level of wettability and hydrophilicity. In a particular embodiment of the invention, topsheet 64 is a nonwoven, spunbond polypropylene fabric composed of about 2.8 - 3.2 denier fibers formed into a web having a basis weight of about 22 gsm and density of
30 about 0.06 gm/cc. The fabric can be surface treated with an operative amount of surfactant, such as about 0.28% Triton X-102 surfactant. The surfactant can

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be applied by any conventional means, such as spraying, printing, brush coating or the like.

In various embodiments, as described below, the topsheet can be made of extensible materials, as described with respect to the body panels and
5 backsheets. For example, the topsheet can be prenecked for extensibility.

The backsheet 68 is preferably liquid impermeable, but may be liquid permeable, e.g., when a barrier layer is used with the retention portion. For example, in one embodiment, the backsheet can be made from a thin plastic film, or other flexible, substantially liquid-impermeable material. As used
10 herein, the term "flexible" means a material that is compliant and which will readily conform to the general shape and contour of the body of the user. The backsheet prevents various bodily fluids and exudates from wetting or otherwise contaminating various bedding or outer garments worn by the user over the absorbent garment. In particular, the backsheet can include a film, such as a
15 polyethylene film, having a thickness of from about 0.012 mm to about 0.051 mm.

In other alternative constructions, the backsheet can comprise a woven or nonwoven fibrous web layer, which is treated or constructed, partially or wholly, to impart the desired levels of liquid impermeability to selected regions
20 that are adjacent to or proximate the absorbent retention portion. For example, the backsheet may include a gas-permeable, nonwoven fabric layer laminated to a polymer film layer which may or may not be gas-permeable. Other examples of fibrous, cloth-like backsheet materials can comprise a stretch thinned or stretch thermal laminate material composed of a 0.6 mil (0.015 mm) thick
25 polypropylene cast film and a 0.7 ounce per square yard (23.8 gm) polypropylene spunbond material (2 denier fibers). A material of this type has been employed to form the outercover of a HUGGIES® Ultratrim Disposable Diaper, which has been commercially available from Kimberly-Clark Corporation. The backsheet 68 typically provides the outercover of the article.
30 Optionally, however, the article may include a separate outercover component

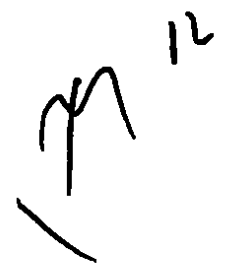
member which is additional to the backsheet. The outercover can be joined, for example, to one or more of the absorbent composite and/or body panels.

The backsheet may include a micro-porous, "breathable" material which permits gases, such as water vapor, to escape from the absorbent garment while
5 substantially preventing liquid exudates from passing through the backsheet. For example, the breathable backsheet may be composed of a microporous polymer film or a nonwoven fabric which has been coated or otherwise modified to impart a desired level of liquid impermeability. For example, a suitable microporous film can be a PMP-1 material, which is available from
10 Mitsui Toatsu Chemicals, Inc., a company having offices in Tokyo, Japan; or an XKO-8044 polyolefin film available from 3M Company of Minneapolis, Minnesota. The backsheet may also be embossed or otherwise provided with a pattern or matte finish to exhibit a more aesthetically pleasing appearance.

In various configurations of the invention, where a component, such as
15 the backsheet is configured to be permeable to gas while having a resistance and limited permeability to aqueous liquid, the liquid resistant component can have a construction which is capable of supporting a selected hydrohead of water substantially without leakage therethrough. A suitable technique for determining the resistance of a material to liquid penetration is Federal Test
20 Method Standard FTMS 191 Method 5514, 1978, or an equivalent thereof.

In one preferred embodiment, the backsheet is sufficiently impermeable to liquid and semi-liquid materials to substantially prevent the undesired leakage of waste materials, defined as exudates, including for example urine and feces. For example, the backsheet member can desirably support a hydrohead of at
25 least about 45 centimeters (cm) substantially without leakage. The backsheet member can alternatively support a hydrohead of at least about 55 cm, and optionally, can support a hydrohead of at least about 60 cm, or more, to provide improved benefits.

The backsheet is preferably extensible, as that term is defined above
30 with respect to the body panels. In one preferred embodiment, the backsheet is capable of providing an elongation of at least about 1 cm when subjected to a



tensile force of 11.8 g/cm, and further provides a substantially permanent deformation of at least about 20% when subjected to a tensile force of 19.70 g/cm and is then allowed to relax under a zero applied stress for a period of 1 minute.

5 For example, the extensible backsheets can be composed of a necked fiber, a creped fiber, a micro-pleated fiber, polymer films or the like, as well as combinations thereof. The fabrics may be woven or nonwoven materials, such as spunbond fabrics. One example of a suitable extensible material is a 60% necked, polypropylene spunbond having a basis weight of about 1.2 oz/yd.

10 The backsheets also can be expandable, for example when it has one or more folds, e.g., one or more z-folds (not shown), or can be both extensible and expandable. The term expandable as used herein means to enlarge or to increase the extent or area, lateral and/or longitudinal, thereof, e.g., by unfolding one or more folds.

15 The retention portion 70 is preferably made of an absorbent material, which tends to swell or expand as it absorbs liquid excreted or exuded by the user. For example, the absorbent material can be made of airformed, airlaid and/or wetlaid composites of fibers and high absorbency materials, referred to as superabsorbents. Superabsorbents typically are made of polyacrylic acids,
20 such as FAVOR 880 available from Stockhausen, Inc. of Greensboro, North Carolina. The fibers can be fluff pulp materials, such as Alliance CR-1654, or any combination of crosslinked pulps, hardwood, softwood, and synthetic fibers. Airlaid and wetlaid structures typically include binding agents, which are used to stabilize the structure. In addition, various foams, absorbent films,
25 and superabsorbent fabrics can be used as an absorbent material.

 In one preferred embodiment, an absorbent material is made of fibrous absorbent materials with a relatively high internal integrity, including for example one made with thermoplastic binder fibers in airlaid absorbents, e.g., pulp, bicomponent binding fibers, and superabsorbents, which have higher
30 densities in the folded regions. The higher density and resulting smaller capillary size in these regions promotes better wicking of the liquid. Better

wicking, in turn, promotes higher utilization of the absorbent material and tends to result in more uniform swelling throughout the absorbent material as it absorbs the liquid.

Various types of wettable, hydrophilic fibrous material can be used to form the component parts of absorbent, and particularly the retention portion 70. Examples of suitable fibers include naturally occurring organic fibers composed of intrinsically wettable material, such as cellulosic fibers; synthetic fibers composed of cellulose or cellulose derivatives, such as rayon fibers; inorganic fibers composed of an inherently wettable material, such as glass fibers; synthetic fibers made from inherently wettable thermoplastic polymers, such as particular polyester or polyamide fibers; and synthetic fibers composed of a nonwettable thermoplastic polymer, such as polypropylene fibers, which have been hydrophilized by appropriate means. The fibers may be hydrophilized, for example, by treatment with silica, treatment with a material which has a suitable hydrophilic moiety and is not readily removable from the fiber, or by sheathing the nonwettable, hydrophobic fiber with a hydrophilic polymer during or after the formation of the fiber. For the purposes of the present invention, it is contemplated that selected blends of the various types of fibers mentioned above may also be employed.

As used herein, the term "hydrophilic" describes fibers or the surfaces of fibers which are wetted by the aqueous liquids in contact with the fibers. The degree of wetting of the materials can, in turn, be described in terms of the contact angles and the surface tensions of the liquids and materials involved. Equipment and techniques suitable for measuring the wettability of particular fiber materials or blends of fiber materials can be provided by a Cahn SFA-222 Surface Force Analyzer System, or a substantially equivalent system. When measured with such system, fibers having contact angles less than 90° are designated "wettable", while fibers having contact angles greater than 90° are designated "nonwettable".

In particular arrangements, the retention portion of the absorbent may comprise a mixture of superabsorbent hydrogel-forming particles and synthetic

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polymer meltblown fibers, or a mixture of superabsorbent particles with a fibrous coform material comprising a blend of natural fibers and/or synthetic polymer fibers. The superabsorbent particles may be substantially homogeneously mixed with the hydrophilic fibers, or may be nonuniformly mixed. For example, the concentrations of superabsorbent particles may be arranged in a non-step-wise gradient through a substantial portion of the thickness (z-direction) of the absorbent structure, with lower concentrations toward the bodyside of the absorbent composite and relatively higher concentrations toward the outside of the absorbent structure. Suitable z-gradient configurations are described in U.S.P. 4,699,823 issued October 13, 1987 to Kellenberger et al., the entire disclosure of which is incorporated herein by reference in a manner that is consistent (not in conflict) with the present description. Alternatively, the concentrations of superabsorbent particles may be arranged in a non-step-wise gradient, through a substantial portion of the thickness (z-direction) of the absorbent structure, with higher concentrations toward the bodyside of the absorbent composite and relatively lower concentrations toward the outside of the absorbent structure. The superabsorbent particles may also be arranged in a generally discrete layer within the matrix of hydrophilic fibers. In addition, two or more different types of superabsorbent may be selectively positioned at different locations within or along the fiber matrix.

The high-absorbency material may comprise absorbent gelling materials, such as superabsorbents. Absorbent gelling materials can be natural, synthetic and modified natural polymers and materials. In addition, the absorbent gelling materials can be inorganic materials, such as silica gels, or organic compounds such as cross-linked polymers. The term "cross-linked" refers to any means for effectively rendering normally water-soluble materials substantially water insoluble but swellable. Such means can include, for example, physical entanglement, crystalline domains, covalent bonds, ionic complexes and associations, hydrophilic associations, such as hydrogen bonding, and hydrophobic associations or Van der Waals forces.

Examples of synthetic absorbent gelling material polymers include the alkali metal and ammonium salts of poly(acrylic acid) and poly (methacrylic acid), poly(acrylamides), poly(vinyl ethers), maleic anhydride copolymers with vinyl ethers and alpha-olefins, poly(vinyl pyrrolidone),
5 poly(vinylmorphollnone), poly(vingyl alcohol), and mixtures and copolymers thereof. Further polymers suitable for use in the absorbent composite include natural and modified natural polymers, such as hydrolyzed acrylonitrile-grafted starch, acrylic acid grafted starch, methyl cellulose, chitosan, carboxymethyl cellulose, hydroxypropyl cellulose, and the natural gums, such as alginates,
10 xanthan gum, locust bean gum and the like. Mixtures of natural and wholly or partially synthetic absorbent polymers can also be useful in the present invention. Other suitable absorbent gelling materials are disclosed by Assarsson et al. in U.S. Patent No. 3,901,236 issued August 26, 1975, which is hereby incorporated herein by reference. Processes for preparing synthetic
15 absorbent gelling polymers are disclosed in U.S. Patent No. 4,076,663 issued February 28, 1978 to Masuda et al. and U.S. Patent No. 4,286,082 issued August 25, 1981 to Tsubakimoto et al., both of which are hereby incorporated herein by reference.

Synthetic absorbent gelling materials typically are xerogels which form
20 hydrogels when wetted. The term "hydrogel", however, has commonly been used to also refer to both the wetted and unwetted forms of the material.

As mentioned previously, the high-absorbency material used in the absorbent is generally in the form of discrete particles. The particles can be of any desired shape, for example, spiral or semi-spiral, cubic, rod-like,
25 polyhedral, etc. Shapes having a large greatest dimension/smallest dimension ration, like needles, flakes and fibers, are also contemplated for use herein. Conglomerates of particles of absorbent gelling material may also be used in the absorbent. Desired for use are particles having an average size of from about 20 microns to about 1 millimeter. "Particle size" as used herein means the
30 hydrophilic fibers and high-absorbency particles can be configured to form an average composite basis weight which is within the range of about 50 -1500

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gsm. In certain aspects of the invention, the average composite basis weight is within the range of about 200 - 1200 gsm, and alternatively is within the range of about 200 -1200 gsm, and alternatively is within the range of about 500 -800 gsm to provide desired performance. Furthermore, the proportion of high absorbency particles can range from about 0 to about 100% and the proportion of fibrous material from about 0 to about 100%. Additionally, high absorbency fibers can be used such as Oasis Type 121 and Type 122 superabsorbent fibers available from Technical Absorbent Ltd., Grimsby, Lincolnshire, United Kingdom.

10 The retention portion 70 has laterally opposed side edges 74 and preferably is made of a single layer of material. As shown in FIG. 29, the absorbent composite 50 and retention portion 70 have a generally rectangular shape. Alternatively, as shown in FIGS. 1 and 30, the retention portion 70 has an hour-glass shape, with a narrower middle portion and enlarged end portions.

15 The absorbent composite, and in particular the top sheet and backsheet also can be configured in an hour-glass shape with enlarged end regions. In other alternative embodiments, the retention portion can include a folded or multi-layered configuration. The retention portion preferably has a length substantially equal to, or slightly shorter than, the length of the absorbent

20 composite. The retention portion can include one or more barrier layers attached to the absorbent material. In one embodiment, an upper and lower tissue substrate 88, 90 also can be disposed adjacent the retention portion, or alternatively the tissue can completely envelope the retention position.

Referring to FIG. 1, the opposite garment side of the end regions 56, 58 of the absorbent composite, and in particular, the outer, garment side surface of the backsheet 68, are secured to the bodyside surface of the longitudinally opposed crotch ends of the first and second body panels 4, 6. Preferably, the garment side surface of the end regions 56, 58 overlap and are connected to the bodyside surface of the body panels along three longitudinally extending,

30 parallel, spaced locations 76, 78. It should be understood that the absorbent composite can be secured using any of the methods of attachment described

above, including for example and without limitation, adhesive bonds, sonic bonds, thermal bonds, pinning, stitching or other attachment techniques known in the art, as well as combinations thereof. Moreover, it should be understood that the three locations are meant to be illustrative, and that the lateral width
5 (W) of the absorbent composite defined between the opposite outboard edges of attachment can be secured to the body panels with any configuration of attachment lines, swirls, patterns, spots, etc., or can be a full and continuous attachment therebetween. The outboard attachment locations 76, or the outboard edge of the area of attachment, are preferably spaced inboard from the
10 side edge 52 of the absorbent composite, preferably slightly outboard of the side edges 74 of the retention portion. The retention portion 70 preferably has a lesser lateral width than the overall absorbent composite.

In particular, in the embodiment shown in FIGS. 1-4, the backsheet and topsheet have laterally extending side margins 82, 80 that extend laterally
15 outboard from the side edge 74 of the retention portion and from the location 76 of attachment to the body panels. It should be understood that the term "location" means any region, dot, position or side, and is not limited to the longitudinally extending lines shown in the Figures. For example, the location could comprise a series of longitudinally extending dots or points. Conversely,
20 the location could comprise a continuous region or area attachment extending across the lateral width (W) of the absorbent composite between the outboard edges of the attached region of the absorbent composite. The term "attached region" means the region extending between the opposite outboard edge of the attachment locations, and is shown, for example, as having a width W in FIG.
25 3. The side margins 80, 82 are preferably formed along the entire longitudinal extent of the portion of the absorbent composite that overlaps the body panels, and also extend along the crotch and the absorbent composite between the body panels. The side margins 80, 82 are not attached to the body panels 4, 6 and terminate in free edges 84, 86.

30 It should be understood that the side margins may extend along only a portion of the overlapping absorbent composite. For example, and referring to

FIGS. 29 and 30, the absorbent composite 50 is connected to each of the body panels 4, 6 with a T-shaped attachment pattern 176, 178, or location. In particular, the garment side surface of the end regions 56, 58 of the absorbent composite overlap and are connected to the body side surface of the body panels 4, 6 along a longitudinally extending location 180, 184 at a center portion of the absorbent composite and of the body panels, and also along laterally extending locations 182, 186 at each end of the absorbent composite, thereby forming the stepped, T-shaped pattern. Preferably, the laterally extending attachment locations 182, 186 at the four corners at the ends of the absorbent composite, in combination with the portion of the longitudinally extending location at the end of the absorbent composite, forms a laterally extending attachment location that extends along substantially the entirety of the width of the absorbent composite at the end thereof. In an alternative embodiment, the absorbent composite 50 is secured to the body panels only at the four corner locations 182, 186, with the space therebetween remaining unattached to the body panels. The length of the laterally extending attachment locations can vary from almost nothing, wherein just the end or edge of the absorbent composite is secured to the body panel at those locations 182, 186, to almost the entirety of the length of the absorbent composite that overlaps the body panel. Indeed, in one alternative embodiment, the entirety of the absorbent composite that overlaps the body panel can be secured thereto.

A side margin 188, 190 extends laterally outward from each side of the longitudinal location 180, 184 at the center portion and terminates in a free edge 192, 194. In addition, the side margins 188, 190, and the free edges 192, 194, extend longitudinally inward along the length of the absorbent composite from the lateral attachment locations 182, 186 at the ends of the absorbent composite. In this way, the four corners 182, 186 of the absorbent composite are secured to the body panels, yet the absorbent composite is provided with opposite side margins extending along the length of the portion of the absorbent composite overlapping the body panels inward from those locations on each side of the absorbent composite. In this way, the side margins are prevented from being

folded over the absorbent area of the absorbent composite so as to impede the absorption of exudates. It should be understood that the side margins 188, 190 shown in FIGS. 29 and 30 can be formed from any of the topsheet, backsheet, or combination thereof, or any other component of the absorbent composite, with or without folds, as variously disclosed herein.

In a preferred embodiment, the width of the portion of the side margin overlapping the body panels between the longitudinal location and the free edge remains relatively constant. It should be understood that in other embodiments, the width can vary, as shown for example in FIG. 17 as explained below, or as that width is defined between other non-parallel and/or curvilinear configurations of the attachment locations and free edges.

It should be understood that in an alternative embodiment, the retention portion, or one or more other layers including for example the surge layer or tissue layers, also can have opposite side margins that extend outboard from the locations 76 of attachment to the body panels and are sandwiched between the side margins 80, 82.

The side margins preferably have a lateral width greater than about 3 mm and less than about 75 mm. More preferably, the side margins each have a width of between about 15 mm and about 45 mm, and more preferably a width of between about 25 mm and about 35mm. Preferably, the side margins have a combined lateral width that is at least 3% and not more than about 75% of the total lateral width of the absorbent composite, and more preferably between about 15% and 50% of the total lateral width, and even more preferably between about 25% and 35%. The body panels extend beyond the lateral and longitudinal edges of the side margins of the absorbent composite.

In the embodiments shown in FIGS. 5-8, 29 and 30, one or more elastic elements 92, shown as there, are secured in the side margins 84, 86 between the topsheet and backsheet, and extend longitudinally along a portion of the side margins on each side of the absorbent composite. Preferably, the elastic elements extend along the side margins of the absorbent composite between the body panels and overlap a portion of each body panel 4, 6. The length of the

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elastic elements is preferably between about 5% and 100% of the length of the absorbent composite. For example, as shown in FIG. 29, the elastic elements 92 extend along the side margins from the lateral attachment location 182 at the end of the absorbent composite secured to the front body panel 4 across the terminal edge 14 of the rear body panel. The function of the elastic elements 92 in the side margins of the absorbent composite are to shorten the length of the side margin which pulls the side margins inwardly to form a three-dimensional profile so as to seal or gasket against the body of the user. At the same time, in the embodiments of FIGS. 17, 29 and 30, the attachment of the absorbent composite 50 at the four corners thereof prevents the side margins from being folded or drawn over the absorbent area. In addition, assembly of the garment is facilitated since the absorbent composite lies flat when the elastic elements are stretched in the machine direction. The elastic elements can be positioned at various laterally spaced positions, depending on the amount of shortening and upward lift desired. The elastic elements can be made of ribbon, films, sprays of elastic, or other elastic configurations known in the art. It should be understood that elastic elements can be incorporated into any of the other side margin configurations described herein.

In a third embodiment shown in FIGS. 9-12, the topsheet side margin 80 includes a first portion 94 folded over a second portion 96, with a side margin portion 82 of the backsheet disposed between the first and second portions 94, 96 of the topsheet. The folded first and second portions 94, 96 form a folded edge 98 that defines the free edge of the side margin of the absorbent composite. The function of the folded topsheet is to provide a clothlike feel to the portion 82 of the backsheet that forms the side margin. Preferably, the topsheet covers at least the free edge 86 of the backsheet, which provides comfort to the user with minimal cost.

In yet another embodiment shown in FIGS. 25-28, the body panel 300 is continuous from the rear of the garment through the crotch region to the front of the garment. In such an embodiment, the absorbent composite can be attached to the front 302, rear 304 and crotch 306 portions of the body panel.

In essence, a crotch body panel extends between and connects a front and rear body panel. The body panel 300 is preferably made of continuous sheets or layers that form the three regions, although it should be understood that separate pieces can be joined, e.g., by bonding, stitching etc., to form the full
5 length body panel.

In one embodiment, the two locations 172 of attachment would extend the length of the absorbent composite. In one embodiment, shown in FIG. 26, the body panel width in the crotch region 306, defined by outboard edges 310, extends between the outboard attachment locations, or is preferably
10 substantially the same width as the width "W" of the attached region, and more preferably is substantially the same width as the retention portion. In an alternative embodiment, the body panel extends outboard from the attachment locations, but remains unattached to the side margins of the absorbent composite. Preferably, the absorbent composite extends substantially the entire
15 length of the garment, although it should be understood that it could have a length less than the entire length of the garment, as shown for example in FIG. 1.

In another embodiment, shown in FIGS. 13-16, the side margin is formed only by the topsheet, with the backsheets having side edges terminating
20 proximate the attachment locations. Preferably, the topsheet has a folded first and second portion 94, 96 forming a folded edge 98 that defines the free edge of the side margin. Conversely, it should be understood that the side margin can be formed only by the backsheets, which can be monolayer, or which can have various folds, including for example a folded first and second portion. It
25 should be understood that the first portion can be folded under the second portion, as shown in the Figures, or folded over the second portion. It also should be understood that the side margin could have additional folds, formed for example by a third portion interfolded with the first and second portions. Preferably, each side margin or the side margins in combination have a width or
30 range of widths as described above.

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In another embodiment, shown in FIGS. 17-20, the side margin 80 is tapered from a first width D1 adjacent a first position 102 at the terminal edge of the body panel to a second width D2 adjacent a second position 104 at the end of the end edge of the absorbent composite. In one embodiment, the second width is zero. Preferably, D1 ranges from not less than about 5% to not greater than about 50% of the total lateral width of the absorbent composite. Preferably, D2 ranges from about 0 to not greater than about 50% of the total lateral width of the absorbent composite. The gradient attachment location 106 allows the marginal side edges of the absorbent composite to fold inwardly in the crotch region during use to gasket with the user, while the attachment at the end regions provides and maintains the area of coverage of the absorbent composite in the front and back panels without affecting the fit of the garment. In particular, as with the embodiments of FIGS. 29 and 30, the four corners of the absorbent composite 50 are secured to the body panels to prevent the side margins 80 from folding over the absorbent area, yet the absorbent composite is provided with opposite side margins extending along the length thereof between those locations on each side of the absorbent composite.

In another embodiment, shown in FIGS. 21-24, the absorbent composite 50 extends substantially the entire length of and defines the length of the absorbent composite and preferably the absorbent garment. Each of the bodyside surfaces of the inboard terminal edges 180, 184 of the front and back side panels 108, 110 are secured to the absorbent composite along a location 172 spaced laterally inboard from the side edge 52 of the absorbent composite so as to form opposite side margins 80, 82. As such, the side margins extend the entire longitudinal length of the body panels and the garment. It should be understood that although the side margins 80, 82 are shown as being formed from the backsheet and topsheet, without a folded edge, any of the above-described side margin configurations could be used, including a folded topsheet configuration. Indeed, it should be understood that any of the aforementioned configurations of the side margins, whether formed from one or both of the backsheet and topsheet, with or without folded portions and with or without

elastic elements, can be incorporated into an absorbent composite attached to any of the aforementioned body panel configurations, or their equivalents, including without limitation, a continuous one-piece body panel (whether made from one or more layers or plies), a two-piece body panel, or a four piece body
5 panel.

Although the present invention has been described with reference to preferred embodiments, those skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention. As such, it is intended that the foregoing detailed description be
10 regarded as illustrative rather than limiting and that it is the appended claims, including all equivalents thereof, which are intended to define the scope of the invention.

WHAT IS CLAIMED IS:

1. An absorbent garment comprising:
a body panel having a bodyside surface; and
an absorbent composite having an end, a garment-side surface, a
5 longitudinally extending length and a laterally extending width and comprising a
backsheet, a topsheet and a retention portion disposed between said backsheet
and said topsheet, wherein said garment-side surface of said absorbent
composite overlaps and is connected to said bodyside surface of said body panel
along at least a longitudinally extending location and along substantially an
10 entirety of said laterally extending width at a laterally extending location at said
end of said absorbent composite, and wherein said absorbent composite
comprises a side margin extending laterally outboard from said longitudinally
extending location and terminating in a free edge extending longitudinally from
said laterally extending location, wherein said side margin has a relatively
15 constant width between said longitudinally extending location and said free
edge.
2. The invention of claim 1 wherein said absorbent composite comprises a
first and second longitudinally opposed end regions, wherein said end of said
20 absorbent composite comprises a first end of said first end region and wherein
said second end region has a second end, and wherein said body panel
comprises a first body panel overlapping and connected to said first end region
and a second body panel overlapping and connected to said second end region,
wherein said first and second body panels are longitudinally spaced apart, and
25 wherein said absorbent composite is connected to said first body panel along at
least one longitudinally extending first location and along an entirety of said
laterally extending width at a laterally extending second location at said first
end of said absorbent composite, and wherein said absorbent composite is
connected to said second body panel along at least one longitudinally extending
30 third location and along an entirety of said laterally extending width at a
laterally extending fourth location at said second end of said absorbent

composite, and wherein said side margin extends laterally outboard from each of said first and third locations and longitudinally between said second and fourth locations.

5 3. The invention of claim 2 wherein said first body panel comprises a first pair of side body panels and wherein said second body panel comprises a second pair of side body panels, wherein each of said side body panels comprises an outboard terminal edge and an inboard terminal edge, wherein
10 said at least one first location comprises a pair of first locations and wherein said at least one third location comprises a pair of third locations, and wherein said inboard terminal edges of each of said first pair of side body panels is attached to said absorbent composite at one of said pairs of said first locations respectively and wherein said inboard terminal edge of each of said second pair of side body panels is attached to said absorbent composite at one of said pairs
15 of said third locations, and wherein said absorbent composite comprises opposite side margins extending laterally outboard from each of said first and third locations.

4. The invention of claim 1 wherein said side margin is formed from said
20 backsheets.

5. The invention of claim 1 wherein said side margin is formed from said topsheet.

25 6. The invention of claim 5 wherein side margin comprises a first portion of said topsheet folded over a second portion of said topsheet, wherein said folded first and second portions form a folded edge defining said free edge of said side margin.

7. The invention of claim 6 wherein said side margin further comprises a portion of said backsheet disposed between said first and second portions of said topsheet.
- 5 8. The invention of claim 1 wherein said side margin is formed from said topsheet and said backsheet.
9. The invention of claim 1 wherein said retention portion has opposite lateral side edges, and wherein side margin extends laterally outboard from one
10 of said side edges of said retention portion.
10. The invention of claim 1 wherein said side margin comprises a longitudinally extending elastic element.
- 15 11. The invention of claim 1 wherein said absorbent composite comprises opposite side margins extending laterally outboard on each side of said absorbent composite and longitudinally from said laterally extending location, wherein said opposite side margins terminate in opposite free edges.
- 20 12. The invention of claim 1 wherein said longitudinally and laterally extending locations form a T-shaped attachment pattern between said absorbent composite and said body panel.
13. An absorbent garment comprising:
- 25 a longitudinally spaced first and second body panel each having a bodyside surface; and
- an absorbent composite having a longitudinally extending length, a laterally extending width and longitudinally opposed first and second end regions and first and second ends, said absorbent composite comprising a
30 backsheet, a topsheet and a retention portion disposed between said backsheet and said topsheet, wherein said first end region of said absorbent composite

overlaps and is connected to said bodyside surface of said first body panel along a center portion of said absorbent composite and across an entirety of said width of said absorbent composite at said first end thereof, and wherein said second end region of said absorbent composite overlaps and is connected to said

5 bodyside surface of said second body panel along a center portion thereof and across an entirety of said width of said absorbent composite at said second end thereof, wherein said absorbent composite comprises a pair of laterally opposed side margins terminating in opposite, longitudinally extending outboard free edges, wherein said side margins are not attached to said first and second body

10 panels and wherein said longitudinally extending free edges extend between the connections across said width of said absorbent composite at said first and second ends thereof and said first and second body panels, and wherein said side margins each have a relatively constant width between said center portion and said free edges.

15

14. The invention of claim 13 wherein said first body panel comprises a first pair of side body panels and wherein said second body panel comprises a second pair of side body panels, wherein each of said side body panels comprises an outboard terminal edge and an inboard terminal edge, wherein

20 said inboard terminal edge is connected to said absorbent composite along said center portion thereof.

15. The invention of claim 13 wherein said side margins are formed from said backsheet.

25

16. The invention of claim 13 wherein said side margins are formed from said topsheet.

17. The invention of claim 16 wherein side margins each comprise a first

30 portion of said topsheet folded over a second portion of said topsheet, wherein

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said folded first and second portions form a folded edge defining said free edge of said side margin.

18. The invention of claim 17 wherein said side margins further comprise a portion of said backsheet disposed between said first and second portions of said topsheet.

19. The invention of claim 13 wherein said side margins are formed from said topsheet and said backsheet.

10

20. The invention of claim 13 wherein said side margins comprise a longitudinally extending elastic element.

21. The invention of claim 20 wherein said elastic element extends along only a portion of said length of said absorbent composite.

22. The invention of claim 13 wherein said first and second end regions of said absorbent composite are connected to said first and second body panels respectively with T-shaped attachment patterns.

20

23. An absorbent garment comprising:
a body panel having a bodyside surface; and
an absorbent composite having a longitudinally extending length, a laterally extending width and at least an end region overlapping said body panel, wherein a garment side surface of said end region is connected to said bodyside surface of said body panel with a T-shaped attachment pattern.

25

24. The invention of claim 23 wherein a portion of said overlapping end region of said absorbent composite not attached to said first and second body panels at said T-shaped attachment pattern forms a side margin having a free edge.

30

25. The invention of claim 23 wherein said body panel comprises a first and second body panel each having a bodyside surface, and wherein said end region of said absorbent composite comprises a first end region overlapping said first
5 body panel and a second end region overlapping said second body panel, wherein a garment side surface of said first and second end regions are connected to said bodyside surface of said first and second body panels with a pair of said T-shaped attachment patterns.
- 10 26. The invention of claim 25 wherein said T-shaped attachment patterns extend along a center portion of said absorbent composite and along the entirety of said width of said absorbent composite at a first and a second end of said absorbent composite.
- 15 27. The invention of claim 25 further comprising an elastic element extending along opposite edges of said absorbent composite between said end regions thereof.
- 20 28. The invention of claim 27 wherein said elastic elements extend along only a portion of said length of said absorbent composite along said opposite edges thereof.

FIG.2

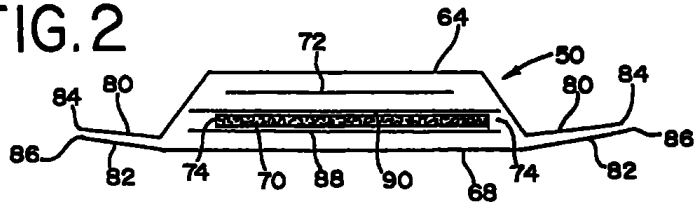


FIG.3

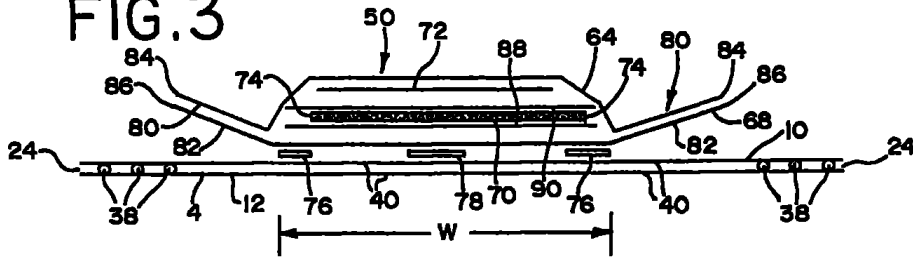


FIG.4

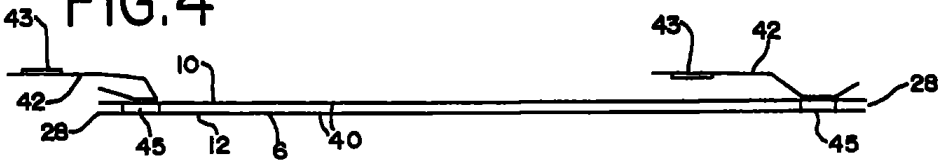


FIG.6

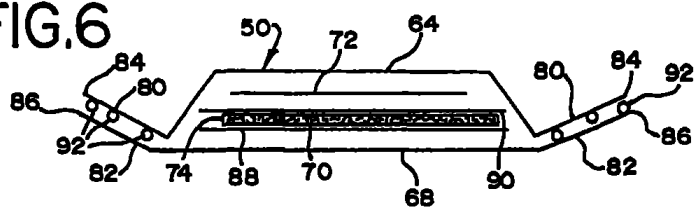


FIG.7

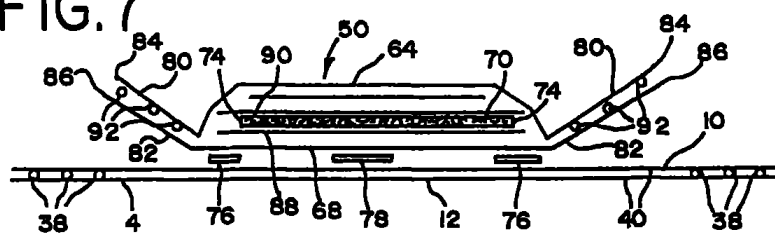
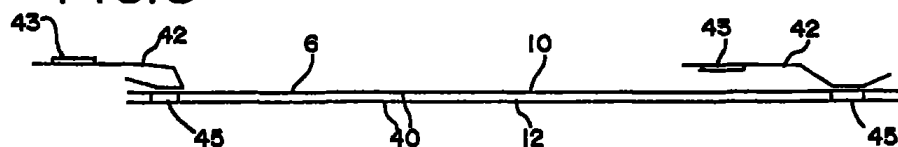


FIG.8



[Handwritten signature]

FIG.9

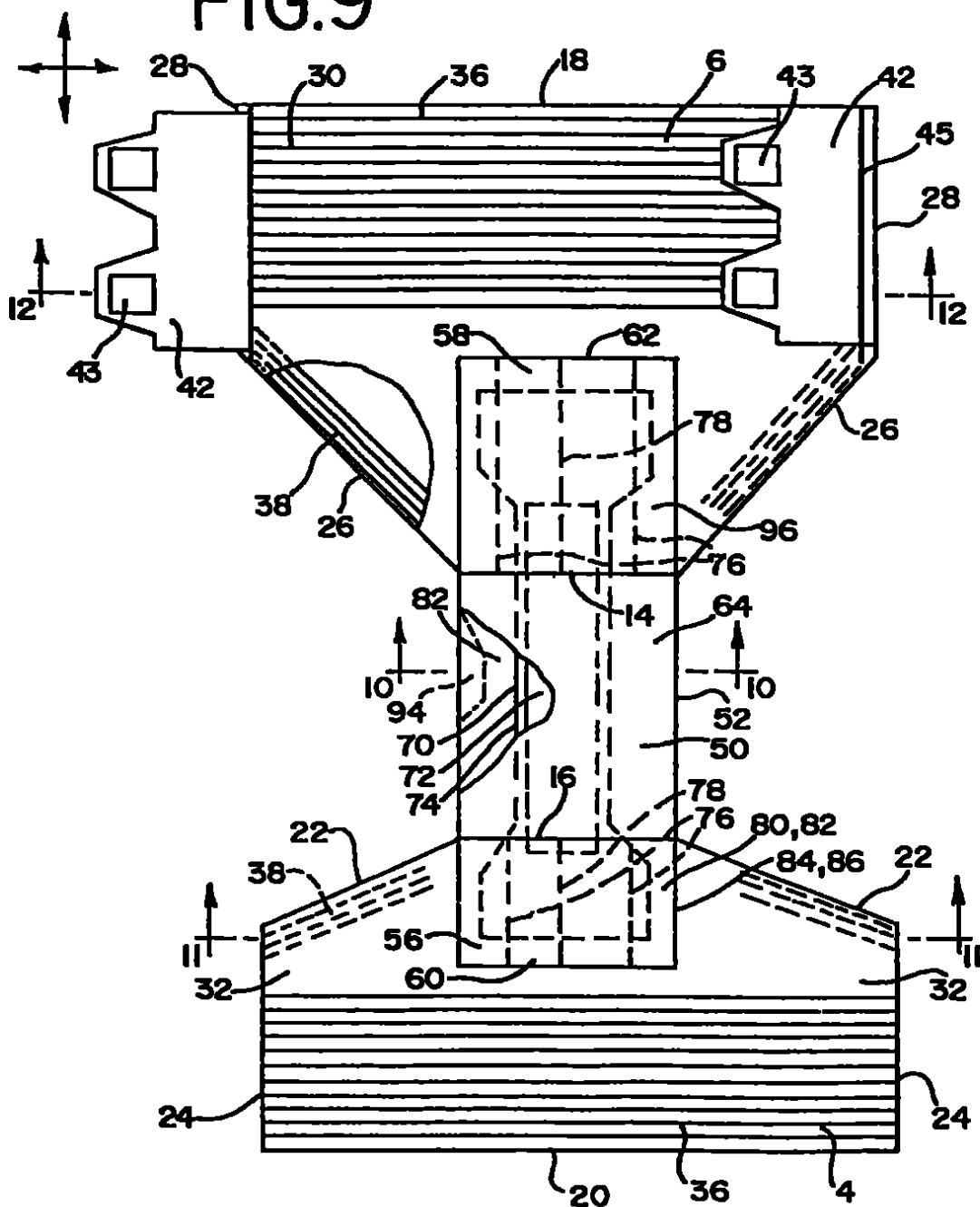


FIG.10

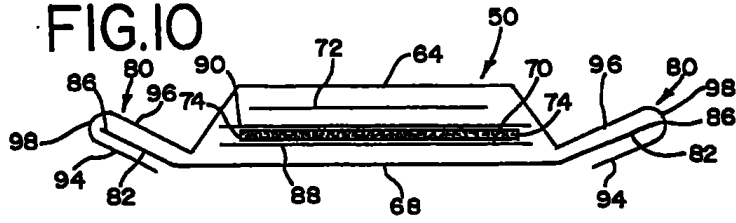


FIG.11

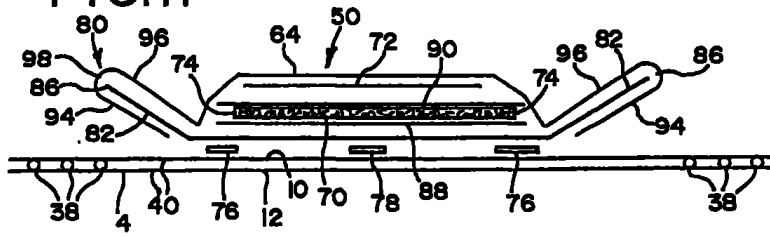
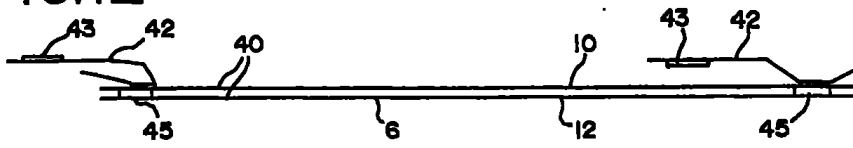


FIG.12



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FIG.13

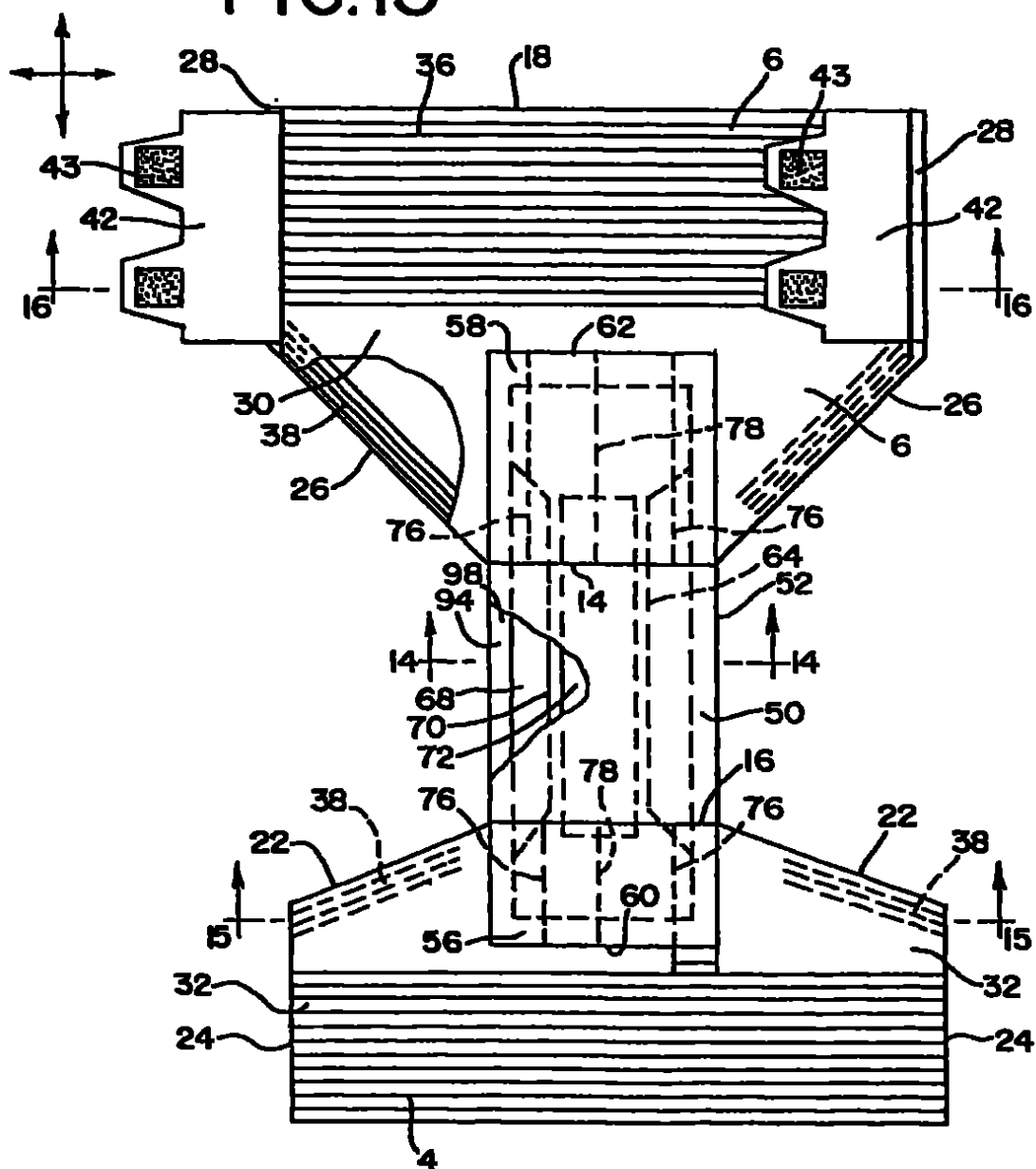


FIG.14

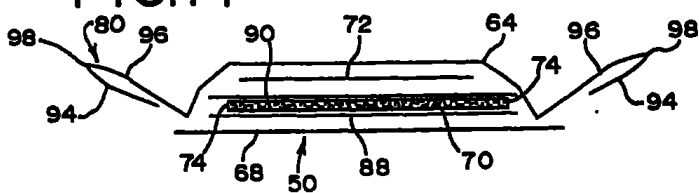


FIG.15

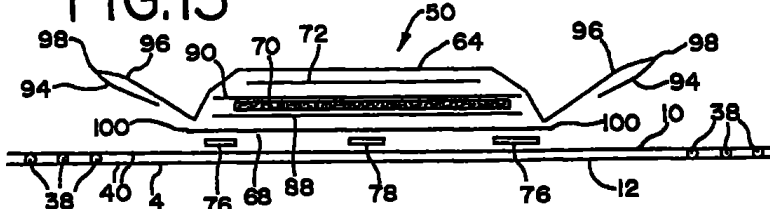


FIG.16

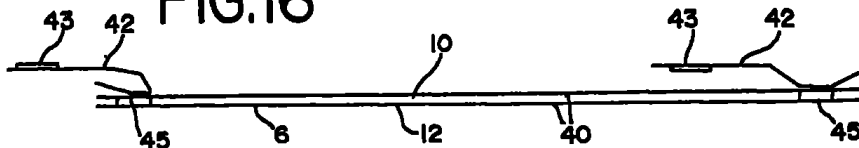
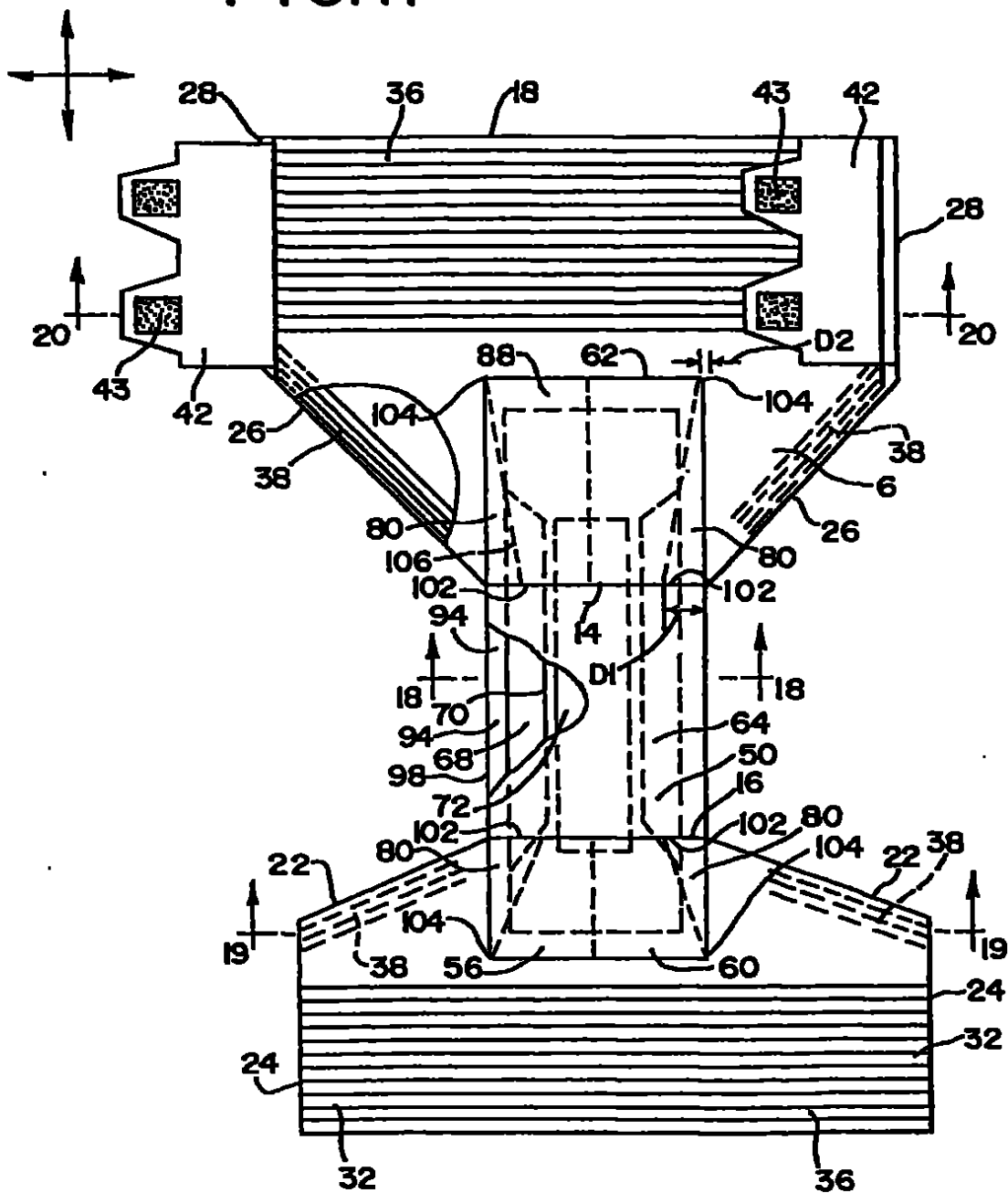


FIG. 17



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FIG.18

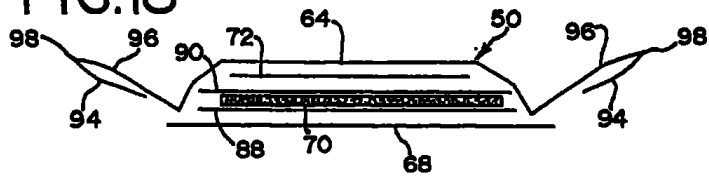


FIG.19

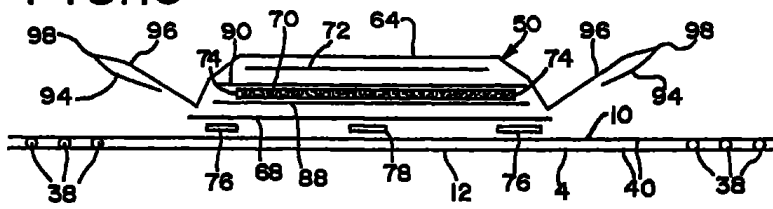


FIG.20

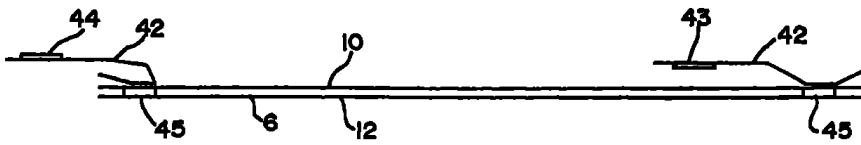


FIG.22

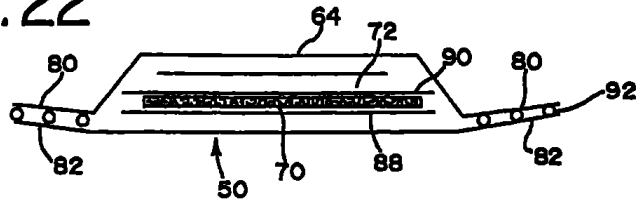


FIG.23

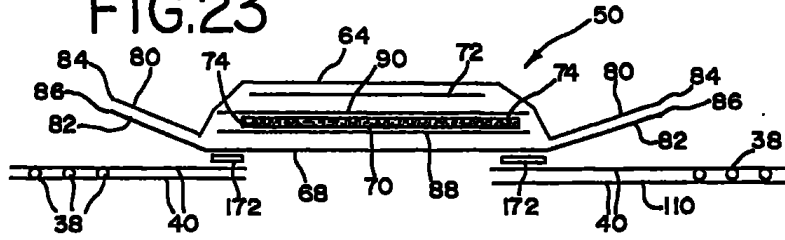


FIG.24

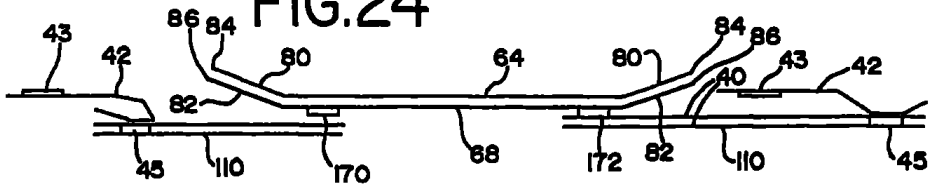


FIG.26

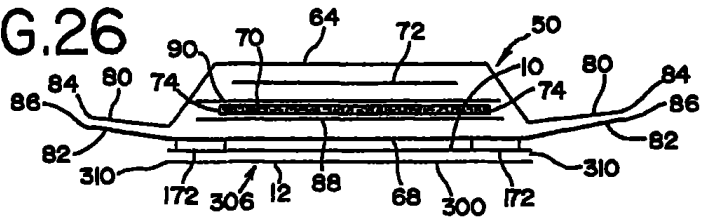


FIG.27

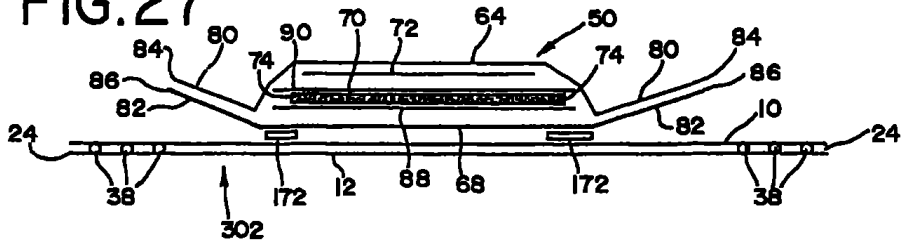
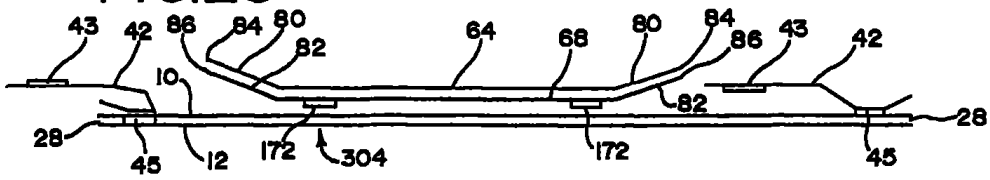


FIG.28



INTERNATIONAL SEARCH REPORT

International No

Election No

PCT/US 02/26702

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61F13/494 A61F13/496

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)

IPC 7 A61F

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

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

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 253 131 A (KAO CORP) 2 September 1992 (1992-09-02) page 4, paragraph 2 - paragraph 3; claim 1; figures 1-4	1,4,5, 8-11,13, 20
Y		2,3,6,7, 14,17,18
Y	PATENT ABSTRACTS OF JAPAN vol. 015, no. 425 (C-0879), 29 October 1991 (1991-10-29) & JP 03 176053 A (ZUIKOU:KK), 31 July 1991 (1991-07-31) abstract; figure 4	2
Y	WO 97 31603 A (KIMBERLY CLARK CO) 4 September 1997 (1997-09-04) figure 2	3,14
	-/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in 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

18 February 2003

Date of mailing of the international search report

26/02/2003

Name and mailing address of the ISA

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Fax: (+31-70) 340-8316

Authorized officer

Mirza, A

INTERNATIONAL SEARCH REPORT

Information: Application No.

PCT/US 02/26702

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96 14815 A (PROCTER & GAMBLE) 23 May 1996 (1996-05-23) figure 5A	6, 7, 17, 18
X	US 5 601 544 A (GLAUG FRANK S ET AL) 11 February 1997 (1997-02-11) column 11, line 33 - line 37; claims; figures	23-28

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/26702

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependant claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-22

an absorbent garment having a body panel and an absorbent composite connected to the bodyside surface of the body panel along a longitudinally extending location and along an entirety of a laterally extending width at a laterally extending location, the absorbent composite comprising a side margin extending laterally extending outboard from the longitudinally extending location having a relatively constant width.

2. Claims: 23-28

an absorbent garment comprising a body panel and an absorbent composite, the garment side surface of the absorbent composite is connected to the body side surface of the of the body panel with a T-shaped attachment pattern.

INTERNATIONAL SEARCH REPORT

 International application No
 PCT/US 02/26702

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PRENDA ABSORBENTE QUE TIENE UN COMPUESTO ABSORBENTE QUE SE
CONFORMA AL CUERPO

ANTECEDENTES

5

La presente invención se refiere generalmente a una prenda absorbente, y en particular, a una prenda absorbente que tiene un compuesto absorbente que se conforma al cuerpo.

10

Las prendas absorbentes, y en particular las prendas absorbentes desechables, a menudo incluyen un compuesto absorbente y uno o más paneles corporales conectados al compuesto absorbente. Típicamente, los compuestos absorbentes están asegurados a los paneles corporales a lo largo de las orillas laterales periféricas del compuesto absorbente. Como tal, el compuesto absorbente puede reducir o de otra manera afectar la extensibilidad del panel corporal, especialmente cuando es deseado que tenga un compuesto absorbente más amplio. Adicionalmente, el compuesto absorbente típicamente no es capaz de conformarse al cuerpo del usuario independientemente de los paneles corporales, y pueden por lo tanto distorsionar los paneles cuando son ajustados a un usuario.

25

En otras incorporaciones, la prenda absorbente puede incluir una hoja superior y una hoja inferior, uno o ambos de los cuales pueden formar en parte solapas que se extienden longitudinalmente. Típicamente, tales solapas están

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dirigidas hacia adentro para formar una artesa y pueden tener uno o más extremos de las mismas aseguradas a la prenda para evitar la inversión de las mismas. Como tales, las solapas no contribuyen al ancho total del compuesto absorbente.

5

SÍNTESIS

Brevemente descrito, en un aspecto, la invención está dirigida a una prenda absorbente que comprende un panel corporal que tiene una superficie de lado del cuerpo y un compuesto absorbente que tiene una longitud que se extiende longitudinalmente y un ancho que se extiende lateralmente y que comprende una hoja inferior, una hoja superior y una parte de retención dispuesta entre la hoja inferior y la hoja superior.

10 El compuesto absorbente está conectado a la superficie de lado al cuerpo del panel corporal y comprende un margen lateral que está sujeto al panel corporal y que se extiende lateralmente hacia fuera y termina en una orilla libre. El compuesto absorbente también está preferiblemente conectado al panel

15 corporal a lo largo de una totalidad del ancho que se extiende lateralmente en la ubicación que se extiende lateralmente en un extremo del compuesto absorbente. El margen lateral y la orilla libre se extienden longitudinalmente desde la ubicación que se extiende lateralmente. Preferiblemente, en una incorporación,

20 el margen lateral tiene un ancho relativamente constante.

25



En una incorporación preferida, el compuesto absorbente está conectado al panel corporal con un patrón de sujeción en forma de T. También en una incorporación preferida, el compuesto absorbente incluye márgenes laterales opuestos lateralmente.

En una incorporación preferida, el margen lateral está formado de la hoja superior. En otra incorporación preferida, el margen lateral está formado de la hoja superior y de la hoja inferior. En una incorporación preferida, una primera parte de la hoja de superior está doblada sobre una segunda parte de la hoja superior para formar una orilla doblada que define la orilla libre del margen lateral. En aún otra incorporación preferida, la hoja inferior está dispuesta entre la primera y la segunda partes de la hoja superior. Las partes de los márgenes laterales pueden incluir un elemento elástico.

En una incorporación preferida, el panel corporal comprende un primero y un segundo paneles corporales separados longitudinalmente. En aún otra incorporación preferida, cada uno del primero y del segundo paneles corporales incluye un par de paneles corporales laterales separados lateralmente.

En otro aspecto de la invención, un método para proteger un usuario de los exudados corporales comprende aplicar la prenda absorbente al cuerpo del usuario.

La presente invención proporciona ventajas significativas sobre otras prendas absorbentes y métodos para el uso y fabricación de las mismas. Por ejemplo, los márgenes laterales sin sujetar pueden doblarse hacia adentro y seguir las líneas corporales del usuario sin distorsionar los paneles corporales. Más aún, los márgenes laterales sin sujetar no restringen el ajuste de las regiones de las piernas de los paneles durante el uso. Adicionalmente, la capacidad absorbente de la prenda puede ser fácilmente cambiada simplemente mediante incrementar el ancho del compuesto absorbente, aun cuando al mismo tiempo mantiene el ancho de la parte del compuesto absorbente que está conectado a los paneles corporales. Como tal, el ancho de los márgenes laterales puede ser incrementado sin afectar el ajuste total de la prenda. Adicionalmente, los elementos elásticos pueden ponerse de pie o ayudar a sellar o a empaquetar los márgenes laterales en contra del cuerpo del usuario. Al mismo tiempo, la configuración de los márgenes laterales que se extienden hacia fuera asegura que los márgenes laterales, especialmente cuando éstos incorporan una barrera a la humedad, no se doblan sobre el área absorbente definida mediante la parte de retención, especialmente cuando el margen lateral incluye elementos elásticos.

La presente invención, junto con las ventajas y los objetos adicionales, podrá ser mejor entendida mediante la referencia de la siguiente descripción detallada tomada en conjunto con los dibujos anexos.

35
27**BREVE DESCRIPCIÓN DE LOS DIBUJOS**

Muchas de las características y dimensiones representadas en los dibujos, y en particular la presentación de espesores de capa y similares, han sido algo exageradas por el bien de la ilustración y la claridad.

La figura 1 es una vista en plano de una primera incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

La figura 2 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 2-2 de la figura 1.

15

La figura 3 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 3-3 de la figura 1.

20

La figura 4 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 4-4 de la figura 1.

La figura 5 es una vista en plano de una segunda incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

25

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La figura 6 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 6-6 de la figura 5.

5 La figura 7 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 7-7 de la figura 5.

La figura 8 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 8-8 de la figura 5.

La figura 9 es una vista en plano de una tercera incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

La figura 10 es una ilustración esquemática de una vista de sección transversal de la prenda absorbente tomada a lo largo de la línea 10-10 de la figura 9.

20 La figura 11 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 11-11 de la figura 9.

25 La figura 12 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 12-12 de la figura 9.

La figura 13 es una vista en plano de una cuarta incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

5 La figura 14 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 14-14 de la figura 13.

10 La figura 15 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 15-15 de la figura 13.

15 La figura 16 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 16-16 de la figura 13.

La figura 17 es una vista en plano de una quinta incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

20

La figura 18 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 18-18 de la figura 17.

25 La figura 19 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea de 19-19 de la figura 17.

La figura 20 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 20-20 de la figura 17.

5 La figura 21 es una vista en plano de una sexta incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

10 La figura 22 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 22-22 de la figura 21.

15 La figura 23 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 23-23 de la figura 21.

La figura 24 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 24-24 de la figura 21.

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La figura 25 es una vista en plano de una sexta incorporación de una prenda absorbente tomada desde el lado del cuerpo de la misma.

25 La figura 26 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 26-26 de la figura 25.

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La figura 27 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 27-27 de la figura 25.

5 La figura 28 es una ilustración esquemática de una vista en sección transversal de la prenda absorbente tomada a lo largo de la línea 28-28 en la figura 25.

La figura 29 es una vista en plano de una séptima
10 incorporación de una prenda absorbente tomada desde el lado al cuerpo de la misma.

La figura 30 es una vista en plano de una octava
incorporación de una prenda absorbente tomada desde el lado al
15 cuerpo de la misma.

DESCRIPCIÓN DETALLADA DE LAS INCORPORACIONES ACTUALMENTE PREFERIDAS

20 Deberá entenderse que el término "longitudinal", como se usó aquí, significa que o se relaciona a la longitud o a la dirección longitudinal, y en particular, a la dirección que corre entre el frente y la parte trasera del usuario. El término "lateralmente", como es usado significa que está
25 situado en, directamente hacia o que corre desde el lado a lado, y en particular, una dirección que corre desde la izquierda a la derecha de un usuario. Los términos "superior",

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"inferior", "interior", y "exterior" como se usaron aquí tienen la intención de indicar la dirección relativa al usuario que usa una prenda absorbente sobre la región de la entrepierna, aun cuando los términos "hacia el interior" y "hacia el exterior" se refieren a las direcciones relativas a una línea central 8 de la prenda. Por ejemplo, los términos "interior" y "superior" se refieren a un "lado del cuerpo", el cual significa el lado más cercano al cuerpo del usuario, aun cuando los términos "exterior" e "inferior" se refieren a un "lado de la prenda". El término "lado del cuerpo" no deberá de ser interpretado como que significa en contacto con el cuerpo del usuario, pero más bien simplemente significa el lado que deberá enfrentarse hacia el cuerpo del usuario, sin importar si la prenda absorbente está realmente siendo usada por el usuario y a pesar de si hay o puedan haber capas que intervienen entre el componente y el cuerpo del usuario. De la misma manera, el término "lado de la prenda" no deberá de ser interpretado como que significa en contacto con las prendas del usuario, más bien simplemente significa el lado que se enfrenta lejos del cuerpo del usuario, y por lo tanto hacia cualesquiera de las prendas exteriores que puedan ser usadas por el usuario, sin importar si la prenda absorbente está realmente siendo usada por un usuario, sin importar si cualquiera de tales prendas exteriores están realmente siendo usadas y sin importar si pueda haber capas que intervienen entre el componente y cualquier prenda exterior.

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Refiriéndonos a las figuras 1, 5, 9, 13, 17, 20 y 21, una prenda absorbente 2 incluye un primer, panel corporal delantero 4 y un segundo, panel corporal trasero 6. El primero y el segundo paneles corporales cada uno tiene una superficie de lado del cuerpo, interior 10 una superficie de lado de la prenda, exterior y una longitud, la cual es menor que la longitud total de la prenda absorbente. Cada uno del primero y del segundo paneles corporales tiene una primera y una segunda orillas extremo terminales opuestas longitudinalmente 16, 14, 20, 18 y orillas laterales exteriores, que incluyen una orilla ahusada 22 y 26 y una orilla hacia el exterior 24 y 28 formadas a lo largo de la periferia exterior de las partes de oreja opuestas lateralmente 30 y 32. Alternativamente, como se muestra en las figuras 29 y 30, el panel corporal delantero 4 no incluye una orilla lateral ahusada, pero más bien la orilla de extremo terminal 16 se extiende a lo largo del ancho completo del panel corporal entre las orillas hacia el exterior opuestas 24. Deberá entenderse que el panel corporal trasero puede ser configurado en una manera similar. Refiriéndonos a las figuras 1, 5, 9, 13, 17, 20, 21, 29 y 30, las primeras orillas terminales 14 y 16 del primero y del segundo paneles corporales están longitudinalmente separadas para formar una abertura 34 entre las mismas en la región de la entrepierna de la prenda, aún cuando las segundas orillas terminales 20 y 18 del primero y del segundo paneles corporales forman respectivamente orillas de cintura delantera y trasera. Una pluralidad, que significa dos o más, de los elementos elásticos

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que se extienden lateralmente 36 pueden estar asegurados a cada uno del primero y del segundo paneles corporales. De la misma manera, uno o más elementos elásticos para las piernas 38 pueden estar asegurados a lo largo de la orilla lateral ahusada de los paneles corporales para formar una empaquetadura con la pierna del usuario.

Por ejemplo, como se muestra en las figuras 1 a 4, cada panel puede ser hecho de un material de panel compuesto elástico que comprende dos substratos no tejidos 40 con la pluralidad de tiras elásticas 38 y 36 emparedadas entre los mismos. Las bandas elásticas están colocadas en las regiones de la cintura y a lo largo de los perímetros de las piernas. Una parte de los elementos elásticos para las piernas 38 puede extenderse bajo un margen lateral de un compuesto absorbente 50. La colocación de los elementos elásticos para las piernas del panel más hacia el interior a lo largo de la orilla lateral proporciona un ajuste y rendimiento de la prenda mejorados.

En una incorporación alterna, mostrada en la figura 21, un compuesto absorbente 50 se extiende longitudinalmente a lo largo de la extensión completa de la prenda desde un extremo 116 al otro extremo 118 de la misma. Un par de paneles corporales laterales, delanteros 108 tienen orillas hacia el interior 180 que están aseguradas a las regiones laterales opuestas del compuesto absorbente, preferiblemente en el lado del cuerpo del mismo, adyacente a un extremo del mismo y hacia

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adentro desde una orilla lateral periférica 52 del compuesto
absorbente. De la misma manera, un par de paneles corporales
laterales, traseros 110 tienen orillas hacia el interior 184
que están aseguradas a las regiones laterales opuestas del
5 compuesto absorbente, preferiblemente en el lado del cuerpo del
mismo, adyacente al extremo opuesto del mismo y hacia el
interior desde la orilla lateral periférica 152. Los paneles
corporales 108 y 110 se extienden hacia fuera lateralmente del
compuesto absorbente y forman las partes de oreja 112 y 114 que
10 tienen orillas hacia el exterior 188 y 190. Deberá entenderse
que el compuesto absorbente puede estar alternativamente
asegurado al lado de la prenda de los paneles corporales.

Refiriéndonos a las figuras 1, 5, 9, 13, 17 y 21,
15 las lengüetas de sujeción 42 están sujetadas y se extienden
lateralmente desde la orilla hacia el exterior 28 y 190 de los
paneles corporales traseros desde una ubicación de sujeción 45.
Deberá entenderse que las lengüetas de sujeción pueden estar
fijadas a los paneles corporales delanteros o a ambos paneles
20 corporales delantero y trasero. Para los propósitos de
ilustración, la lengüeta lateral derecha 42 está mostrada como
que está doblada durante la fabricación, aun cuando la lengüeta
lateral izquierda 42 está mostrada como que se extiende hacia
el exterior durante el uso. Las lengüetas de sujeción pueden
25 ser hechas de una combinación de gancho y rizo, tal como un
sistema de sujeción VELCRO®, o pueden tener adhesivo u otros
agentes de unión aplicados a una superficie de las mismas.

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Varias configuraciones de gancho están descritas en la patente de los Estados Unidos de América No. 5.845.375 otorgada a Miller y otros, la patente de los Estados Unidos de América No. 6.132.660 otorgada a Kampfer, la patente de los Estados Unidos de América No. 6.000.106 otorgada a Kampfer, la patente de los Estados Unidos de América No. 5.868.987 otorgada a Kampfer, la patente de los Estados Unidos de América No. 4.894.060 otorgada a Nestegard, y la patente de los Estados Unidos de América No. 6.190.594 B1 otorgada a Gorman, las descripciones completas de las cuales están incorporadas aquí por referencia. Algunos ejemplos de sujetadores de gancho son los varios sujetadores de gancho CS600 fabricados por Minnesota Mining and Manufacturing Co., St. Paul Minnesota.

Como se muestra en la figura 1, la lengüeta 42 puede incluir una o más almohadillas de sujeción 43. Alternativamente, las lengüetas de sujeción pueden incluir los botones, los broches de presión, los amarres o otros dispositivos de sujeción conocidos. Las lengüetas pueden estar aseguradas al panel corporal con uniones de adhesivo, uniones sónicas, uniones térmicas, alfilerado, cosido u otros tipos conocidos de sujeción.

Cuando la prenda absorbente está asegurada al usuario, las lengüetas de sujeción 42 aseguradas a los paneles corporales 6 y 110 en un extremo del compuesto absorbente engranadas o de otra manera conectadas a los paneles corporales

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4 y 108 en el extremo opuesto de la prenda. Alternativamente, un miembro de planicie, el cual es particularmente apropiado para engranar las lengüetas de sujeción y en particular las almohadillas de sujeción, pueden estar dispuestas en el panel corporal. Por ejemplo, un material de unión de patrón, como está descrito por ejemplo en la patente de los Estados Unidos de América No. 5.858.515 otorgada a Stokes, la cual está incorporada aquí por referencia, es particularmente muy apropiada para engranar un material de gancho. Otros materiales de planicie pueden estar incorporados que son apropiados para engranar adhesivos y similares. Cuando están aseguradas en esta forma, las aberturas 120 están formadas en cada lado del compuesto absorbente con la orilla periférica 52 y 152 del compuesto absorbente que adicionalmente define la abertura a lo largo de la región de la entrepierna de la prenda. Cuando están asegurados, los paneles corporales delantero y trasero 108 y 110 forman paneles corporales laterales.

Deberá de entenderse que las orillas hacia el exterior 24, 28, 188 y 190 de los paneles corporales delantero y trasero pueden estar conectados, por ejemplo mediante la unión o el cosido, para crear una costura de una prenda de pantalón. Por ejemplo, las incorporaciones de las figuras 29 y 30 están mostradas sin lengüetas de sujeción, en donde las orillas hacia el exterior 24 y 28 están aseguradas para formar una costura. Sin embargo, deberá entenderse que las lengüetas de sujeción pueden estar incorporadas en esas incorporaciones.

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Alternativamente, los paneles corporales delantero y trasero pueden estar formados integralmente, por ejemplo como un panel lateral sencillo sujetado a los extremos opuestos 116 y 118 del compuesto absorbente, o como un panel que se extiende alrededor de la cintura y de las caderas del usuario. En aún otra incorporación alterna, las orillas hacia el exterior pueden estar conectadas para crear una costura en combinación con las lengüetas de sujeción, las cuales pueden ser usadas por ejemplo y sin limitación para asegurar los paneles corporales a través de una línea de debilidad, tal como una perforación. La línea de debilidad puede ser formada por ejemplo a lo largo de una costura que se rompe entre los paneles corporales delantero y trasero, o a lo largo de una longitud de uno o de ambos de los paneles corporales delantero y trasero.

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En aspectos particulares de la invención, ya sea uno o todos los paneles corporales pueden ser compuestos de un rango amplio de materiales con varios pesos base y propiedades. Por ejemplo, el material del panel corporal puede incluir telas tejidas o tejidas de punto, telas no tejidas, películas de polímero, laminados, y similares, así como combinaciones de las mismas. Preferiblemente, los paneles corporales están hechos de un material elástico, en donde el término "elástico" significa capaz de recuperar el tamaño y la forma del mismo después de la deformación, y/o que exhibe una fuerza retroactiva.

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En varias configuraciones de la invención, el ~~peso~~ base del material del panel corporal puede ser de por lo menos de un mínimo de alrededor de 10 gramos por metro cuadrado. Alternativamente, el peso base puede ser de por lo menos 5 alrededor de 20 gramos por metro cuadrado, y opcionalmente, puede ser de por lo menos de alrededor de 40 gramos por metro cuadrado para proporcionar los beneficios mejorados. En aspectos adicionales, el peso base del material del panel no puede ser de más de un máximo de alrededor de 100 gramos por 10 metro cuadrado. Alternativamente, el peso base no puede ser más de alrededor de 80 gramos por metro cuadrado, y opcionalmente, no puede ser más de alrededor de 60 gramos por metro cuadrado para proporcionar el rendimiento mejorado.

15 En las configuraciones que difieren de la invención, el material del panel corporal puede ser substancialmente permeable al aire o substancialmente impermeable al aire. El material del panel de corporal también puede ser substancialmente permeable al líquido o 20 substancialmente impermeable al líquido. En arreglos particulares, el material del panel corporal puede ser sustancialmente no elastomérico. En otros aspectos, los paneles corporales pueden incluir un material elastomérico el cual es el elastoméricamente estirable en por lo menos a lo largo del 25 ancho del artículo lateral. Los ejemplos de tales materiales elastoméricos pueden incluir un laminado unido de cuello (NBL), un laminado unido estirable (SBL), un laminado térmico

estrechado, o similar, así como combinaciones de los mismos. Tales laminados pueden proporcionar una combinación mejorada a una sensación similar a la tela y del estirado elastomérico. Los paneles corporales pueden ser compuestos de materiales que son elásticos o elastoméricos y exhiben características de estirado biaxial o características de estirado MC/CD, o que son compuestos extensibles.

En las configuraciones deseadas, el material del panel corporal elastomérico puede proporcionar un alargamiento estirado, elastomérico el cual es por lo menos de alrededor del 20%, y deseablemente es por lo menos alrededor de 50%. Alternativamente, el alargamiento estirado puede ser de por lo menos de alrededor de 75%, y opcionalmente, puede ser de por lo menos alrededor de 100% para proporcionar un rendimiento mejorado. En otros aspectos, el alargamiento de estirado elastomérico puede ser no más de alrededor de 400% y deseablemente puede ser no más de alrededor de 200%. Alternativamente, el alargamiento estirado puede ser no más de alrededor de 300%, y opcionalmente puede ser no más de alrededor de 250% para proporcionar un rendimiento mejorado.

El porcentaje de estirado elastomérico u otro alargamiento puede ser determinado de acuerdo con la siguiente fórmula: $100 * (L - L_0) / L_0$;

En donde: L = longitud estirada

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 L_0 = longitud inicial,

Adicionalmente, la cantidad de alargamiento de estirado es determinada bajo una fuerza de tensión aplicada 250
5 gramos de fuerza por pulgada de ancho medido perpendicular a la dirección de la tensión aplicada. Varias configuraciones y materiales de los paneles corporales están adicionalmente mostrados y descritos en la patente de los Estados Unidos de América No. 6.132.410 dirigida a una "Prenda Desechable que
10 Tiene Barreras de Secado con Sujeción que se Expanden a un Absorbente", la descripción entera de la cual está por lo tanto incorporada aquí por referencia.

Los paneles corporales pueden también ser hechos de
15 materiales extensibles, o combinaciones de materiales extensibles y elastoméricos. Deberá de ser fácilmente apreciado que cada uno de los paneles corporales individuales puede ser compuesto de materiales diferentes, o de substancialmente el mismo material.

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El término extensible significa capaz de ser extendido, y que proporciona un alargamiento seleccionado cuando es sujeto a una fuerza de tensión aplicada. El panel corporal también es preferiblemente capaz de proporcionar una
25 deformación sostenida, seleccionada cuando es sujeto a una fuerza de tensión aplicada y entonces se le permite relajarse por un periodo de tiempo seleccionado que es inmediatamente

después de la remoción de la fuerza de tensión. Preferiblemente la deformación sostenida es substancialmente la deformación permanente. El alargamiento seleccionado y la deformación sostenida preferiblemente ocurren por lo menos a lo largo de la dirección transversal lateral de la prenda, aunque deberá entenderse que también puede ocurrir a lo largo de la dirección longitudinal, o en ambas. Varios materiales extensibles, y otros materiales aceptables que pueden ser usados para los paneles corporales y el compuesto absorbente, el cual puede incluir sin limitaciones una parte de retención, una hoja superior y una hoja inferior, están descritos en la solicitud de patente de los Estados Unidos de América S/N 09/249.434 registrada el 12 de febrero de 1999, intitulada Prenda de Cubierta que se Expande, la descripción completa de la cual está por lo tanto incorporada aquí por referencia.

Refiriéndonos otra vez a las figuras 1 a 4, el compuesto absorbente 50 tiene una primera y una segunda regiones de extremo opuestas longitudinalmente 56 y 58 y la primera y la segunda orillas de extremo terminal opuestas longitudinalmente 60 y 62. El compuesto absorbente incluye una substancialmente hoja superior permeable al líquido 64, o un forro, y una substancialmente hoja inferior impermeable al líquido 68, o una capa de barrera. Una parte de retención 70 está dispuesta o emparedada entre la hoja superior y la hoja inferior, las cuales están conectadas, por lo menos a lo largo de sus orillas periféricas. El compuesto absorbente, y en

particular la parte de retención, puede ser hecha en muchas formas diferentes, que incluyen las formas rectangular y la de reloj de arena.

5 La hoja superior y la hoja inferior pueden ser mínimamente sujetadas, por ejemplo en las orillas periféricas, o éstas pueden ser sujetadas a través de substancialmente el área de la superficie completa de las mismas. La hoja superior y la hoja inferior pueden ser unidas por ejemplo con uniones de
10 adhesivo, uniones sónicas, uniones térmicas, alfilerado, cosido o cualesquier otras técnicas de sujeción conocidas en el arte, así como las combinaciones de las mismas. Por ejemplo, una capa continua y uniforme de adhesivo, una capa con patrón de adhesivo, un patrón rociado de adhesivo o cualquier otro
15 arreglo de líneas, de remolino o la construcción de puntos de unión pueden ser usados para unir la hoja superior y la hoja inferior, o a cualquiera de los otros componentes descritos aquí. Las capas adicionales, que incluyen por ejemplo, una capa de surgimiento 72, también pueden ser incorporadas en el
20 compuesto absorbente. Preferiblemente, la capa de surgimiento no corre la longitud completa del compuesto absorbente y es más corta que la parte de retención. En configuraciones alternas, la hoja superior está indirectamente unida a la hoja inferior mediante fijar la hoja superior a las capas intermedias, tal
25 como la capa de surgimiento o la parte de retención, la cual a su vez está fijada a la hoja inferior.



La hoja superior 64 presenta una superficie que se enfrenta al cuerpo que es condescendiente, suave al tacto, y no irritante a la piel del usuario. Además, la hoja superior 64 puede ser menos hidrofílica que en la parte de retención 20, y es suficientemente porosa para ser permeable al líquido, permitiéndole al líquido para fácilmente penetrar a través de su espesor para alcanzar la parte de retención. Una capa de hoja superior 64 apropiada puede ser fabricada de una amplia selección de materiales de tejido, tal como las espumas porosas, las espumas reticuladas, las películas plásticas aberturadas, las fibras naturales (por ejemplo, las fibras de algodón o de madera), las fibras sintéticas (por ejemplo, las fibras de polipropileno o de poliéster), o una combinación de fibras sintéticas y naturales. La capa superior 64 es típicamente empleada para ayudar aislar la piel del usuario de los líquidos mantenidos en la parte de retención.

Varias telas no tejidas y tejidas pueden ser usadas para la hoja superior 64. Por ejemplo, la hoja superior puede ser compuesta de un tejido enlazado por hilado o soplado con fusión de fibras deseadas, y puede también ser un tejido cardado unido. Las varias telas pueden ser compuestas de fibras naturales, fibras sintéticas o combinaciones de las mismas.

Para los propósitos de la presente descripción, el término "tela no tejida" significa un tejido de material fibroso el cual es formado sin la ayuda de un proceso de cosido

o de tejido textil. El término "telas" es usado para referirse a todos los tejidos fibrosos no tejidos, cosidos y tejidos.

Las telas de la hoja superior pueden ser compuestas de substancialmente material hidrofóbico, y el material hidrofóbico puede opcionalmente ser tratado con un surfactante o con otros procesos para impartir un nivel deseado de humectabilidad y de hidrofiliicidad. En una incorporación particular de la invención, la hoja superior 64 es una tela de polipropileno enlazada por hilado, no tejida compuesta de alrededor de 2,8 a 3,2 denier de fibras formadas en un tejido que tiene un peso base de alrededor de 22 gramos por metro cuadrado y una densidad de alrededor de 0,06 gramos por centímetro cúbico. La tela puede ser superficie tratada con una cantidad operativa de surfactante, tal como alrededor de 0,28% de surfactante Triton X-102. El surfactante puede ser aplicado mediante cualquier medio convencional, tal como el rociado, la impresión, el revestimiento por cepillado o similar.

En varias incorporaciones, como se describen abajo, la hoja superior puede ser hecha de materiales extensibles, como están descritos con respecto a los paneles corporales y la hoja inferior. Por ejemplo, la hoja superior puede ser preestirada por la extensibilidad.

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La hoja inferior 68 preferiblemente impermeable al líquido, pero puede ser permeable al líquido, por ejemplo,

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cuando una capa de barrera es usada con la parte de retención. Por ejemplo, en una incorporación, la hoja inferior puede ser hecha de una película plástica delgada, o de otro material substancialmente impermeable al líquido, flexible como es usado aquí, el término "flexible" significa un material que es condescendiente y el cual puede ser fácilmente conformado a la forma general y el contorno del cuerpo del usuario. La hoja inferior evita que varios exudados y fluidos corporales humedezcan o de otra manera contaminen las varias prendas exteriores o la ropa para la cama usadas por el usuario sobre la prenda absorbente. En particular, la hoja inferior puede incluir una película, tal como una película de polietileno, que tiene un espesor de desde alrededor de 0,012 milímetros a alrededor de 0,051 milímetros.

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En otras construcciones alternativas, la hoja inferior puede comprender una capa tejida fibrosa no tejida o tejida, la cual es tratada o construida, parcialmente o completamente, para impartir los niveles deseados de impermeabilidad al líquido a regiones seleccionadas que están adyacentes a o próximas a la parte de retención absorbente. Por ejemplo, la hoja inferior puede incluir una capa de tela no tejida, permeable al gas laminada a una capa de película de polímero la cual puede o no puede ser permeable al líquido. Otros ejemplos de materiales de hoja inferior similar a la tela, fibrosos pueden comprender un material laminado térmico estirado o estirado delgado compuesto de una película fundida

de polipropileno de 0,6 mils (0,015 milímetros) y un material
enlazado por hilado de polipropileno de 0,7 onzas por yarda
cuadrada (23,8 gramos por metro cuadrado) (fibras de 2 denier).
Un material de este tipo ha sido empleado para formar la
5 cubierta exterior de un pañal desechable Ultratrim HUGGIES®, el
cual ha estado disponible comercialmente por la Kimberly-Clark
Corporation. La hoja inferior 68 típicamente proporciona la
cubierta exterior del artículo. Opcionalmente, sin embargo, el
artículo puede incluir un miembro de componentes de cubierta
10 exterior separado el cual es adicional a la hoja inferior. La
cubierta exterior puede ser unida, por ejemplo, a uno o más de
los paneles corporales y/o del compuesto absorbente.

La hoja inferior puede incluir un material "con
15 capacidad para respirar", microporoso el cual le permite a los
gases, tales como el vapor de agua, a esta parte de la prenda
absorbente aun cuando substancialmente evita que los exudados
líquidos pasen a través de la hoja inferior. Por ejemplo, la
hoja inferior con capacidad para respirar puede ser compuesta
20 de una tela no tejida o de una película de polímero microporosa
la cual ha sido revestida o de otra manera modificada para
impartir un nivel deseado de impermeabilidad al líquido. Por
ejemplo, una película microporosa apropiada puede ser un
material PMP-1, la cual está disponible de Mitsui Toatsu
25 Chemicals, Inc., una compañía que tiene oficinas en Tokio,
Japón; o una película de poliolefina XKO-8044 disponible de 3M
Company de Minneapolis, Minnesota. La hoja interior también



puede ser repujada o de otra manera proporcionada con un patrón o un acabado mate para exhibir una apariencia estéticamente más agradable.

5 En varias configuraciones de la invención, donde un componente, tal como la hoja inferior está configurada para ser permeable al gas aun cuando tiene una resistencia y una permeabilidad limitada al líquido acuoso, el componente resistente al líquido puede tener una construcción de la cual
10 es capaz de soportar una hidrocabeza seleccionada de agua substancialmente sin goteo a través de la misma. Una técnica apropiada para determinar la resistencia de un material a la penetración del líquido es el método de prueba federal normal FTMS 191 método 5514, 1978, o un equivalente del mismo.

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 En una incorporación preferida, la hoja inferior es suficientemente impermeable a los materiales semilíquidos y líquidos para sustancialmente evitar el goteo no deseado de materiales de desperdicio, definidos como exudados, que
20 incluyen por ejemplo la orina y las heces. Por ejemplo, el miembro de hoja inferior puede deseablemente soportar una hidrocabeza de por lo menos alrededor de 45 centímetros (cm) substancialmente sin goteo. El miembro de hoja inferior puede alternativamente soportar una hidrocabeza de por lo menos
25 alrededor de 55 centímetros, y opcionalmente, puede soportar una cabeza de por lo menos alrededor de 60 centímetros, o más, para proporcionar los beneficios mejorados.

La hoja inferior es preferiblemente extensible, como ese término fue definido anteriormente con respecto a los paneles corporales. En una incorporación preferida, la hoja inferiores capas de proporcionar un alargamiento de por lo menos de alrededor de 1 centímetro cuando es sujeta a una fuerza de tensión de 11,8 gramos por centímetro, y adicionalmente proporciona una substancialmente deformación permanente de por lo menos alrededor del 20% cuando es sujeta a una fuerza de tensión de 19,70 gramos por centímetro cuadrado y entonces se le permite relajarse bajo una tensión aplicada de cero por un periodo de 1 minuto.

Por ejemplo, la hoja inferior extensible puede ser compuesta de una fibra de estirada, una fibra crepada, una fibra microplegada, películas de polímero o similares, así como las combinaciones de las mismas. Las telas pueden ser materiales no tejidos o tejidos, tales como las telas enlazadas por hilado. Un ejemplo de un material extensible apropiado es un enlazado por hilado de polipropileno, estirado de 60% que tiene un peso base de alrededor de 1,2 onzas por yarda cuadrada.

La hoja inferior también puede ser expandible, por ejemplo cuando tiene uno o más dobleces, por ejemplo, uno o más dobleces en z (no mostrados), o puede ser ambos extensible y expandible. El término expandible como es usado aquí significa el alargar o el incrementar la extensión o el área, lateral y/o

longitudinal, de la misma, por ejemplo, mediante desdoblarse uno o más dobleces.

La parte de retención 70 es preferiblemente hecha de un material absorbente, el cual tiende a hincharse o a expandirse mientras absorbe el líquido excretado o exudado por el usuario. Por ejemplo, el material absorbente puede ser hecho de compuestos formados por aire, tendidos por aire y/o tendidos húmedos de fibras y de materiales de alta absorbencia, referidos como superabsorbentes. Los superabsorbentes típicamente son hechos de ácidos poliacrílicos, tales como el FAVOR 880 disponible de Stockhausen, Inc. de Greensboro, North Carolina. Las fibras pueden ser materiales de pulpa esponjosa, tal como la Alliance CR-1654, o cualquier combinación de fibras de pulpas entrelazadas, de madera dura, de madera suave y sintéticas. Las estructuras tendidas húmedas y tendidas por aire típicamente incluyen los agentes aglomerantes, los cuales son usados para estabilizar la estructura. Adicionalmente, varias espumas, películas absorbentes, y telas superabsorbentes pueden ser usadas como un material absorbente.

En una incorporación preferida, un material absorbente está hecho de materiales absorbentes fibrosos con una relativamente integridad interna superior, que incluye por ejemplo uno hecho con fibras aglomerantes termoplásticas en absorbentes tendidos por aire, por ejemplo, las fibras aglomerantes de bicomponentes, de pulpa, y los

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superabsorbentes, los cuales tienen densidades superiores en las regiones dobladas. La densidad superior y el tamaño de vaso capilar más pequeño que resulta en estas regiones promueve un mejor escurrimiento de líquido. El mejor escurrimiento, a su vez, promueve la utilización superior del material absorbente y tiende a resultar en un hinchado más uniforme a través del material absorbente mientras absorbe el líquido.

Varios tipos de material fibroso hidrofílico, humedecible pueden ser usados para formar las partes del componente de la absorbente, y particularmente la parte de retención 70. Los ejemplos de fibras apropiadas incluyen las fibras orgánicas que ocurren naturalmente compuestas de material intrínsecamente humedecible, tal y como las fibras celulósicas; las fibras sintéticas y compuestas de celulosa o de derivados de celulosa, tales como las fibras de rayón; las fibras inorgánicas compuestas de un material inherentemente humedecible, tal como las fibras de vidrio; las fibras sintéticas hechas de polímeros termoplásticos inherentemente humedecibles, tales como las fibras de poliamida o de poliéster particulares; y las fibras sintéticas compuestas de un polímero termoplástico no humedecibles, tales como las fibras de polipropileno, las cuales han sido hidrofilizadas por medios apropiados. Las fibras pueden ser hidrofilizadas, por ejemplo, mediante el tratamiento con sílice, el tratamiento con un material el cual tiene una mitad hidrofílica apropiada y no es fácilmente removible de la fibra, o mediante el entablado de la

fibra hidrofóbica, no humedecible con un polímero hidrofílico durante y después de la formación de la fibra. Para los propósitos de la presente invención, está contemplado que las mezclas seleccionadas de los varios tipos de fibras mencionadas anteriormente pueden también ser empleadas.

Como es usado aquí, el término "hidrofílico" describe las fibras o las superficies de las fibras las cuales son humedecidas mediante líquidos acuosos en contacto con las fibras. El grado de humedecimiento de los materiales puede, a su vez, ser descrito en términos de los ángulos de contacto y de las tensiones de superficie de los líquidos y de los materiales involucrados. El equipo y las técnicas apropiadas para medir la humectabilidad de las mezclas o de los materiales de fibra particulares pueden ser proporcionados por el sistema analizador de fuerza de superficie Cahn SFA-222, o un sustancialmente sistema equivalente. Cuando son medidas con tal sistema, las fibras que tienen ángulos de contacto de menos de 90° son designadas "humedecibles", aun cuando las fibras que tienen ángulos de contacto superiores a 90° son designadas "no humedecibles".

En arreglos particulares, la parte de retención del absorbente puede comprender una mezcla de partículas formadoras de hidrogel superabsorbentes y de fibras sopladas con fusión de polímero sintético, o una mezcla de partículas superabsorbentes con un material coform fibroso que comprende una mezcla de

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fibras naturales y/o fibras de polímero sintéticas. Las partículas superabsorbentes pueden ser substancialmente homogéneamente mezcladas con las fibras hidrofílicas, o pueden ser no uniformemente mezcladas. Por ejemplo, las

5 concentraciones de partículas superabsorbentes pueden ser arregladas en un gradiente no dual a través de una parte substancial del espesor (dirección z) de la estructura absorbente, con concentraciones inferiores hacia el lado del cuerpo del compuesto absorbente y relativamente concentraciones

10 superiores hacia el lado exterior de la estructura absorbente. Las configuraciones de gradiente z apropiadas están descritas en la patente de los Estados Unidos de América No. 4.699.823 otorgada el 13 de octubre de 1987 a Kellenberger y otros, la descripción completa de la cual está incorporada aquí por

15 referencia en una manera que es consistente (no conflictiva) con la presente descripción. Alternativamente, las concentraciones de partículas superabsorbentes pueden ser arregladas en un gradiente no gradual, a través de una parte substancial del espesor (dirección z) de la estructura

20 absorbente, con concentraciones superiores hacia el lado del cuerpo del compuesto absorbente y relativamente concentraciones inferiores hacia el lado exterior de la estructura absorbente. Las partículas superabsorbentes pueden también ser arregladas en una generalmente capa discreta dentro del aglomerante de

25 fibras hidrofílicas. Adicionalmente, dos o más tipos diferentes de superabsorbentes pueden ser selectivamente colocados en

ubicaciones diferentes dentro o a lo largo del aglomerante de fibra.

El material de alta absorbencia puede comprender
5 materiales absorbentes gelificantes, tales como los superabsorbentes. Los materiales absorbentes gelificantes pueden ser materiales naturales, sintéticos y polímeros naturales modificados. Adicionalmente, los materiales absorbentes gelificantes pueden ser materiales inorgánicos,
10 tales como los geles de sílice, o compuestos orgánicos tales como los polímeros entrecruzados. El término "entrecruzado" se refiere a cualquier medio para efectivamente rendir los materiales normalmente solubles al agua substancialmente insolubles al agua pero hinchables. Tales medios pueden
15 incluir, por ejemplo, el enredado físico, los dominios cristalinos, las uniones covalentes, los complejos iónicos y las asociaciones, las asociaciones hidrofílicas, tales como la unión de hidrógeno, y las asociaciones hidrofóbicas o las fuerzas Van der Waals.

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Los ejemplos de polímeros de materiales gelificantes absorbentes sintéticos incluyen el metal alcalino y las sales de amonio de poli(acrílico ácido) y el poli(metacrílico ácido), las poli(acrilamidas), los poli(vinilo
25 de éteres), los copolímeros de anhídrido maléico con éteres de vinilo y las alfa-olefinas, el poli(vinil pirrolidona), el poli(vinil morfolinona), el poli(vinilo de alcohol); y las

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mezclas y los copolímeros de los mismos. Los polímeros adicionales apropiados para uso en el compuesto absorbente incluyen los polímeros naturales modificados y naturales, tales como el almidón injertado de acrilonitrilo hidrolizado, el
5 almidón injertado de ácido acrílico, la celulosa de metilo, la quitosana, la celulosa de carboximetilo, la celulosa de hidroxipropilo, y las gomas naturales, tales como los alginatos, la goma de xantano, la goma de algarroba y similares. Las mezclas de naturales y completos o parcialmente
10 polímeros absorbentes sintéticos también pueden ser útiles en la presente invención. Otros materiales gelificantes absorbentes apropiados están descritos por la patente de los Estados Unidos de América No. 3.901.236 otorgada a Assarsson y otros otorgada el 26 de agosto de 1975, la cual está
15 incorporada aquí por referencia. Los procesos para preparar los polímeros gelificantes absorbentes sintéticos están descritos en la patente de los Estados Unidos de América No. 4.076.663 otorgada el 28 de febrero de 1978 a Masuda y otros y la patente de los Estados Unidos de América No. 4.286.082 otorgada el 25
20 de agosto de 1981 a Tsubakimoto y otros, ambas de las cuales están incorporadas aquí por referencia.

Los materiales gelificantes absorbentes sintéticos típicamente son los xerogeles los cuales forman hidrogeles
25 cuando son humedecidos. El término "hidrogel", sin embargo, ha sido comúnmente usado para también referirse a ambas formas humedecidas y no humedecidas del material.

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Como previamente se mencionó, el material de alta absorbencia usado en el absorbente está generalmente en la forma de partículas discretas. Las partículas pueden ser de cualquier forma deseada, por ejemplo, en espiral o semiespiral, cúbicas, similares a la varilla, poliédricas, etcétera. Las formas que tienen una proporción de dimensión más larga/dimensión más pequeña, como las agujas, las hojuelas y las fibras, están también contempladas para su uso aquí. Los conglomerados de partículas de material gelificantes absorbente pueden también ser usados en el absorbente. Deseables para uso como partículas que tienen un tamaño promedio de desde alrededor de 20 micrones hasta alrededor de 1 milímetro. El "tamaño de partícula" como es usado aquí significa las fibras hidrofílicas y las partículas de alta absorbencia que pueden ser configuradas para formar un peso base compuesto promedio las cuales están dentro del rango desde alrededor de 50 a 1500 gramos por metro cuadrado. En ciertos aspectos de la invención, el peso base de compuesto promedio está dentro del rango de alrededor de 200 a 1200 gramos por metro cuadrado, y alternativamente está dentro del rango de alrededor de 200 a 1200 gramos por metro cuadrado, y alternativamente está dentro del rango de alrededor de 500 a 800 gramos por metro cuadrado para proporcionar el rendimiento deseado. Adicionalmente, la proporción de las partículas de absorbencia superior puede estar en el rango desde alrededor de 0 hasta alrededor de 100% y la proporción de material fibroso desde alrededor de 0 hasta alrededor de 100%. Adicionalmente, las fibras de alta

absorbencia pueden ser usadas tales como las fibras superabsorbentes Oasis tipo 121 y tipo 122 disponibles de Technical Absorbent Ltd., Grimsby, Lincolnshire, del Reino Unido.

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La parte de retención 70 tiene orillas laterales opuestas lateralmente 74 y preferiblemente esta hecha de una capa sencilla de material. Como se muestra en la figura 29, el compuesto absorbente 50 y la parte de retención 70 tienen una
10 generalmente de forma rectangular. Alternativamente, como se muestra en las figuras 1 y 30, la parte de retención 70 tiene una forma de reloj de arena, con una parte media más estrecha y partes de extremo alargadas. El compuesto absorbente, y en particular la hoja superior y la hoja inferior también pueden
15 ser configuradas en una forma de reloj de arena con regiones de extremo alargadas. En otras incorporaciones alternas, la parte de retención puede incluir una configuración de capas múltiples o dobladas. La parte de retención preferiblemente tiene una longitud substancialmente igual a, o ligeramente más corta que,
20 la longitud del compuesto absorbente. La parte de retención puede incluir una o más capas de barrera sujetadas al material absorbente. En una incorporación, un substrato de tisú superior e inferior 88 y 90 también pueden estar dispuestos adyacentes a la parte de retención, o alternativamente el tisú puede
25 completamente envolver la posición de retención.



Refiriéndonos a la figura 1, el lado de la prenda opuesto de las regiones de extremo 56 y 58 del compuesto absorbente, y en particular, la superficie del lado de la prenda, exterior de la hoja inferior 68, están aseguradas a la superficie del lado del cuerpo de los extremos de la entrepierna opuestos longitudinalmente del primero y del segundo paneles corporales 4 y 6. Preferiblemente, la superficie de lado de la prenda de las regiones de extremo 56 y 58 se superponen y están conectadas a la superficie de lado del cuerpo de los paneles corporales a lo largo de tres ubicaciones separadas, paralelas, que se extienden longitudinalmente 76 y 78. Deberá entenderse que el compuesto absorbente puede estar asegurado usando cualquiera de los métodos de sujeción descritos anteriormente, que incluyen por ejemplo y sin limitación, las uniones adhesivas, las uniones sónicas, las uniones térmicas, el alfilerado, el cosido u otras técnicas de sujeción conocidas en el arte, así como las combinaciones de los mismos. Más aún, deberá entenderse que las tres ubicaciones son para ser ilustrativas, y que el ancho lateral (W) del compuesto absorbente definido entre las orillas hacia el exterior opuestas de sujeción pueden estar aseguradas a los paneles corporales con cualquier configuración de líneas de sujeción, de remolinos, de patrones, de manchas, etcétera, o pueden ser una sujeción continua y completa entre las mismas.

Las ubicaciones de sujeción hacia el exterior 76, o la orilla hacia el exterior del área de sujeción, están preferiblemente separadas hacia el interior de la orilla lateral 52 del

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compuesto absorbente, preferiblemente ligeramente hacia el exterior de las orillas laterales 74 de la parte de retención. La parte de retención 70 preferiblemente tiene un ancho lateral menor que el compuesto absorbente total.

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En particular, en la incorporación mostrada en las figuras 1 a 4, la hoja inferior y la hoja de superior tienen márgenes laterales que se extienden lateralmente 82 y 80 que se extienden lateralmente hacia el exterior de la orilla lateral 74 de la parte de retención y de la ubicación 76 de sujeción de los paneles corporales. Deberá entenderse que el término "ubicación" significa cualquier región, punto, posición o lado, y no está limitado a las líneas que se extienden longitudinalmente mostradas en las figuras. Por ejemplo, la ubicación puede comprender una serie de puntos o marcas que se extienden longitudinalmente. A la inversa, la ubicación puede comprender un área o región de sujeción continua que se extiende a través del ancho lateral (W) del compuesto absorbente entre las orillas hacia el exterior de la región de sujeción del compuesto absorbente. El término "región sujeta" significa la región que se extiende entre la orilla hacia el exterior opuesta de las ubicaciones de sujeción, y esta mostrada, por ejemplo, como que tiene un ancho W en la figura 3. Los márgenes laterales 80 y 82 están preferiblemente formados a lo largo de la extensión longitudinal completa de la parte del compuesto absorbente que se sobrepone a los paneles corporales, y también se extiende a lo largo de la entrepierna

y el compuesto absorbente entre los paneles corporales. Los márgenes laterales 80 y 82 no están sujetos a los paneles corporales 4 y 6 y terminan en orillas libres 84 y 86.

5 Deberá entenderse que los márgenes laterales pueden extenderse a lo largo solamente de una parte del compuesto absorbente que se sobrepone. Por ejemplo, y refiriéndonos a las figuras 29 y 30, el compuesto absorbente 50 está conectado a cada uno de los paneles corporales 4 y 6 con un patrón de
10 sujeción en forma de T 176 y 78 ó la ubicación. En particular, la superficie del lado de la prenda de las regiones de extremo 56 y 58 del compuesto absorbente se sobrepone y están conectados a la superficie del lado del cuerpo de los paneles corporales 4 y 6 a lo largo de una ubicación que se extienden
15 longitudinalmente 180 y 184 en una parte central del compuesto absorbente y de los paneles corporales, y también a lo largo de las ubicaciones que se extienden lateralmente 182 y 186 en cada extremo del compuesto absorbente, por lo que forman un patrón en forma de T, escalonado. Preferiblemente, las ubicaciones de
20 sujeción que se extienden lateralmente 182 y 186 en las cuatro esquinas de los extremos del compuesto absorbente, en combinación con la parte de la ubicación que se extiende longitudinalmente en el extremo del compuesto absorbente, forma una ubicación de sujeción que se extiende lateralmente que se
25 extiende a lo largo substancialmente la totalidad del ancho del compuesto absorbente en el extremo del mismo. En una incorporación alterna, el compuesto absorbente 50 está

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asegurado a los paneles laterales solamente en las ubicaciones de las cuatro esquinas 182 y 186, con el espacio entre los mismos que permanece sin sujetar a los paneles corporales. La longitud de las ubicaciones de sujeción que se extienden lateralmente pueden variar desde casi nada, en donde sólo del extremo o la orilla del compuesto absorbente está asegurado al panel corporal en estas ubicaciones 182 y 186, a casi la totalidad de la longitud del compuesto absorbente que se sobrepone al panel corporal. Efectivamente, en una incorporación alterna, la totalidad del compuesto absorbente que se sobrepone al panel corporal puede estar asegurado al mismo.

Un margen lateral 188 y 190 se extiende lateralmente hacia fuera desde cada lado de la ubicación longitudinal 180 y 184 en la parte central y termina en una orilla libre 192 y 194. Adicionalmente, los márgenes laterales 188 y 190, y las orillas libre 192 y 194, se extienden longitudinalmente hacia adentro a lo largo de la longitud del compuesto absorbente desde las ubicaciones de sujeción laterales 182 y 186 en los extremos del compuesto absorbente. En esta forma, las cuatro esquinas 182 y 186 del compuesto absorbente están aseguradas a los paneles corporales, aun el compuesto absorbente es proporcionado con márgenes laterales opuestos que se extienden a lo largo de la longitud de la parte del compuesto absorbente que se sobrepone a los paneles corporales hacia adentro desde esas publicaciones en cada lado



del compuesto absorbente. En esta forma, se evita que los márgenes laterales se han doblado sobre el área absorbente del compuesto absorbente para así impedir la absorción de exudados. Deberá entenderse que los márgenes laterales 188 y 190 mostrados en las figuras 29 y 30 pueden ser formados de cualquier hoja superior, hoja inferior o combinación de las mismas, o de cualquier otro componente del compuesto absorbente, sin o con dobleces, como se ha descrito aquí en forma variada.

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En una incorporación preferida, el ancho de la parte del margen lateral que sobrepone en los paneles corporales entre la ubicación longitudinal y la orilla libre permanece relativamente constante. Deberá entenderse que en otras incorporaciones, el ancho puede variar, como se muestra por ejemplo en la figura 17 y como se explica abajo, o como ese ancho que está definido entre otras configuraciones no paralelas y/o curvilíneas de las ubicaciones de sujeción y de las orillas libres.

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Deberá entenderse que en una incorporación alterna, la parte de retención, o una o más de otras capas que incluyen por ejemplo una capa de surgimiento o capas de tisú, también pueden tener márgenes laterales opuestos que se extienden hacia el exterior desde las ubicaciones 76 de sujeción de los paneles corporales y están emparedados entre los márgenes laterales 80 y 82.

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Preferiblemente los márgenes laterales tienen un ancho lateral superior de alrededor de 3 milímetros y menos de alrededor de 75 milímetros. Más preferiblemente, los márgenes laterales cada uno tiene un ancho de entre alrededor de 15 milímetros y alrededor de 45 milímetros, y más preferiblemente un ancho de entre alrededor de 25 milímetros y alrededor de 35 milímetros. Preferiblemente los márgenes laterales tienen un ancho lateral combinado que es menor de 3% y no más de alrededor de 75% del ancho lateral total del compuesto absorbente, y más preferiblemente entre alrededor de 15% y 50% del ancho lateral total, y aún más preferiblemente entre alrededor de 25 y 35%. Los paneles corporales se extienden más allá de las orillas longitudinales y laterales de los márgenes laterales del compuesto absorbente.

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En las incorporaciones mostradas en las figuras 5 a 8, 29 y 30, uno o más elementos elásticos 92, mostrados ahí, están asegurados a los márgenes laterales 84 y 86 entre la hoja superior en la hoja inferior, y se extienden longitudinalmente a lo largo de una parte de los márgenes laterales en cada lado del compuesto absorbente. Preferiblemente, los elementos elásticos se extienden a lo largo de los márgenes laterales del compuesto absorbente entre los paneles corporales y se sobreponen a una parte de cada panel corporal 4 y 6. La longitud de los elementos elásticos es preferiblemente entre alrededor de 5% y 100% de la longitud del compuesto absorbente. Por ejemplo, como se muestra en la figura 29, los elementos

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elásticos 92 se extienden a lo largo de los márgenes laterales de la ubicación de sujeción lateral 182 en el extremo del compuesto absorbente asegurado al panel corporal delantero 4 a través de la orilla terminar con 14 del panel corporal trasero.

5 La función de los elementos elásticos 92 en los márgenes laterales del compuesto absorbente es la de cortar la longitud del margen lateral el cual jala los márgenes laterales hacia dentro para formar un perfil tridimensional para así sellar o empaquetarse en contra del cuerpo del usuario. Al mismo tiempo, 10 en las incorporaciones de las figuras 17, 29 y 30, la sujeción del compuesto absorbente 50 en las cuatro esquinas del mismo evita que los márgenes laterales se doblen o se jalen sobre el área absorbente. Adicionalmente, el ensamblado de la prenda es facilitado debido a que el compuesto absorbente descansa plano 15 cuando los elementos elásticos son estirados en la dirección de máquina. Los elementos elásticos pueden ser colocados en varias posiciones separadas lateralmente, dependiendo en la cantidad del elevado hacia arriba y el acortamiento deseado. Los elementos elásticos pueden ser hechos de listones, películas, 20 rociado de elástico, u otras configuraciones elásticas conocidas en el arte. Deberá entenderse que los elementos elásticos pueden ser incorporados en cualquiera de las configuraciones de margen lateral descritos aquí.

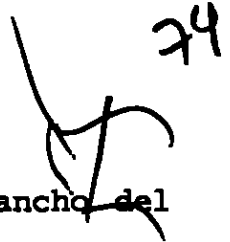
25 En una tercera incorporación mostrada en las figuras 9 a 12, el margen lateral de la hoja superior 80 incluye una primera parte 94 doblada sobre una segunda parte

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96, con una parte de margen lateral 82 de la hoja inferior
dispuesta entre la primera y la segunda partes 94 y 96 de la
hoja superior. El la primera y la segunda partes dobladas 94 y
96 forman la orilla doblada 98 que define la orilla libre del
5 margen lateral del compuesto absorbente. La función de la hoja
superior doblada es la de proporcionar una sensación similar a
la tela de la parte 82 de la hoja inferior que forma el margen
lateral. Preferiblemente, la hoja superior cubre por lo menos
la orilla libre 86 de la hoja inferior, la cual proporciona
10 comodidad al usuario con un costo mínimo.

En aún otra incorporación mostrada en las figuras
25 a 28, el panel corporal 300 es continuo desde la parte
trasera de la prenda a través de la región de la entrepierna en
15 el frente de la prenda. En tal incorporación, el compuesto
absorbente puede estar asegurado a las partes delantera 302,
trasera 304 y de entrepierna 306 del panel corporal. En
esencia, el panel corporal de entrepierna se extiende entre y
conecta un panel corporal delantero y trasero. El panel
20 corporal 300 está preferiblemente hecho de capas o de hojas
continuas que forman las tres regiones, aunque deberá
entenderse que piezas separadas pueden ser unidas, por ejemplo,
mediante la unión, el cocido etc., para formar un panel
corporal de longitud completo.

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En una incorporación, en las dos ubicaciones 172 de
sujeción pueden extender la longitud del compuesto absorbente.

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En una incorporación, mostrada en la figura 26, el ancho del panel corporal en la región de las entrepiernas 306, definido mediante orillas hacia el exterior 310, se extiende entre las ubicaciones de sujeción hacia el exterior, o es preferiblemente sustancialmente el mismo ancho como el ancho "W" de la región sujeta, y más preferiblemente es sustancialmente el mismo ancho como la parte de retención. En una incorporación alterna, el panel corporal se extiende hacia el exterior de las ubicaciones de sujeción, pero permanece sin sujetar a los márgenes laterales del compuesto absorbente. Preferiblemente, el compuesto absorbente se extiende sustancialmente la longitud completa de la prenda, aunque deberá entenderse que puede tener una longitud menor que la longitud completa de la prenda, como se muestra por ejemplo en la figura 1.

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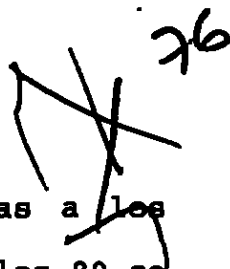
En otra incorporación, mostrada en las figuras 13 a 16, el margen lateral está formado solamente por la hoja superior, con la hoja inferior que tiene orillas laterales que terminan aproximadamente en ubicaciones de sujeción. Preferiblemente, la hoja superior tiene una primera y una segunda partes dobladas 94 y 96 que forman una orilla doblada 98 y que define una orilla libre del margen lateral. A la inversa, deberá entenderse que el margen lateral puede ser formado solamente por la hoja inferior, la cual puede ser una monocapa, o la cual puede tener varios dobleces, que incluyen por ejemplo una primera y una segunda partes dobladas. Deberá entenderse que la primera parte puede ser doblada bajo la

25



segunda parte, como se muestra en las figuras, o dobladas sobre la segunda parte. También deberá entenderse que el margen lateral puede tener dobleces adicionales, formados por ejemplo mediante una tercera parte interdoblada con la primera y la
5 segunda partes. Preferiblemente, cada margen lateral o los márgenes laterales en combinación tienen un ancho o rangos de ancho como se describió anteriormente.

En otra incorporación, mostrada en las figuras 17 a
10 20, el margen lateral 80 está ahusado desde un primer ancho D1 adyacente a la primera posición 102 en la orilla terminal del panel corporal a un segundo ancho D2 adyacente a una segunda posición 104 en extremo de la orilla final del compuesto absorbente. En una incorporación, el segundo ancho es cero.
15 Preferiblemente, el D1 está en el rango desde no menos de alrededor de 5% y no mayor de alrededor de 50% del ancho lateral total del compuesto absorbente. Preferiblemente, el D2 está en el rango desde alrededor de 0 y no mayor de alrededor de 50% del ancho lateral total del compuesto absorbente. La
20 ubicación de sujeción del gradiente 106 le permite a las orillas laterales marginales del compuesto absorbente a doblarse hacia adentro en la región de la entrepierna durante el uso para empaquetarse con el usuario, aun cuando la sujeción de las regiones de extremo proporcionan y mantienen el área de
25 cobertura del compuesto absorbente en los paneles delantero y trasero sin afectar el ajuste de la prenda. En particular, como con las incorporaciones de las figuras 29 y 30, las cuatro



esquinas del compuesto absorbente 50 están aseguradas a los paneles corporales para evitar que los márgenes laterales 80 se doblen sobre el área absorbente, aun cuando el compuesto absorbente es proporcionado sin márgenes laterales opuestos que se extienden a lo largo de la longitud del mismo entre aquellas ubicaciones en cada lado del compuesto absorbente.

En otra incorporación, mostrado en las figuras 21 y 24, el compuesto absorbente 50 se extiende substancialmente la longitud completamente y define la longitud del compuesto absorbente y preferiblemente de la prenda absorbente. Cada una de las superficies del lado del cuerpo en las orillas terminales hacia el interior 180 y 184 de los paneles laterales delantero y trasero 108 y 110 están asegurados al compuesto absorbente a lo largo de una ubicación 172 separada lateralmente hacia dentro desde la orilla lateral 52 del compuesto absorbente para así formar márgenes laterales opuestos 80 y 82. Como tal, los márgenes laterales extienden la longitud longitudinal de los paneles corporales y de la prenda. Deberá entenderse que aunque en los márgenes laterales 80 y 82 están mostrados como que son formados de la hoja inferior y de la hoja superior, sin una orilla doblada, cualquiera de las configuraciones de margen lateral descritas anteriormente pueden ser usadas, que incluye una configuración de hoja superior doblada. Efectivamente, deberá entenderse que cualquiera de las configuraciones anteriormente mencionadas de los márgenes laterales, ya sea formados de una o de ambas de la

hoja superior y de la hoja inferior, con o sin partes dobladas y con o sin elementos elásticos, pueden ser incorporados en el compuesto absorbente sujetado a cualquiera de las configuraciones de panel corporal anteriormente mencionados, o sus equivalentes, que incluyen sin limitación, un panel corporal de una pieza continua (ya sea hecha de una o más capas o estratos), un panel corporal de dos piezas, o un panel corporal de cuatro piezas.

10 Aunque la presente invención ha sido descrita con referencia a las incorporaciones preferidas, aquellos con una habilidad en el arte podrán reconocer que se pueden hacer cambios en forma y en detalle y sin apartarse del espíritu y del alcance de la invención. Como tal, se tiene la intención
15 que la descripción detallada anterior sea tomada como ilustrativa en vez de limitante y que son las reivindicaciones anexas, que incluyen todos los equivalentes de la misma, las cuales se intenta que definan el alcance de la invención.

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HREIVINDICACIONES

1. Una prenda absorbente que comprende:

5 un panel de cuerpo que tiene una superficie del lado al cuerpo; y

un compuesto absorbente que tiene un extremo, una superficie del lado a la prenda, una extensión que se prolonga longitudinalmente y un ancho que se extiende lateralmente y que
10 comprende una hoja inferior, una hoja superior y una parte de retención colocada entre dicha hoja inferior y dicha hoja superior, en donde dicha superficie del lado a la prenda de dicho compuesto absorbente traslapa y está conectada a dicha
15 superficie de dicho panel de cuerpo a lo largo de por lo menos una ubicación que se extiende longitudinalmente y a lo largo de esencialmente una totalidad de dicho ancho que se extiende lateralmente en un lugar que se extiende lateralmente en dicho extremo de dicho compuesto absorbente, y en donde dicho
20 compuesto absorbente comprende un margen lateral que se extiende lateralmente hacia fuera de dicha ubicación que se extiende longitudinalmente y termina en un extremo libre que se extiende lateralmente hacia fuera de dicha ubicación que se extiende longitudinalmente y termina en un extremo libre que se
25 extiende longitudinalmente desde dicha ubicación que se extiende lateralmente, en donde dicho margen lateral tiene un

ancho constante relativamente entre dicha ubicación que se
extiende longitudinalmente y dicha orilla libre.

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2. La invención tal y como se reivindica en la
5 cláusula 1, caracterizada porque el compuesto absorbente
comprende las regiones de extremo opuestas longitudinalmente
primera y segunda en donde dicho extremo de dicho compuesto
absorbente comprende un primer extremo de dicha primera región
de extremo y en donde dicha segunda región de extremo tiene un
10 segundo extremo y en donde dicho panel de cuerpo comprende un
primer panel de cuerpo traslapando y conectado a dicha primera
región de extremo y un segundo panel de cuerpo traslapando y
conectado a dicha segundo región de extremo, en donde dichos
paneles de cuerpo primero y segundo están espaciados y
15 separados longitudinalmente, y en donde dicho compuesto
absorbente está conectado a dicho primer panel de cuerpo a lo
largo de por lo menos una primera ubicación que se extiende
longitudinalmente y a lo largo de una totalidad de dicho ancho
que se extiende lateralmente en un segundo lugar que se
20 extiende lateralmente en dicho primer extremo de dicho
compuesto absorbente y en donde dicho compuesto absorbente está
conectado a dicho segundo panel de cuerpo a lo largo de por lo
menos una tercera ubicación que se extiende longitudinalmente y
a lo largo de una totalidad de dicho ancho que se extiende
25 lateralmente en una cuarta ubicación que se extiende
lateralmente en dicho segundo extremo de dicho compuesto
absorbente, y en donde dicho margen se extiende lateralmente

hacia fuera de cada una de dichas ubicaciones primera y tercera y longitudinalmente entre dichas ubicaciones segunda y cuarta

3. La invención tal y como se reivindica en la
5 cláusula 2, caracterizada porque dicho primer panel de cuerpo comprende un primer par de paneles de cuerpo y en donde dicho segundo panel de cuerpo comprende un segundo par de paneles de cuerpo, en donde cada uno de dichos paneles de cuerpo comprenden una orilla terminal exterior y una orilla terminal
10 interior, en donde dicha por lo menos una primera ubicación comprende un par de primeras ubicaciones y en donde dicha por lo menos una tercera ubicación comprende un par de terceras ubicaciones, y en donde dichas orillas terminales de cada uno de dicho primer par de paneles de cuerpo laterales está
15 sujeto a dicho compuesto absorbente en uno de dichos pares de dichas primeras ubicaciones respectivamente y en donde dicha orilla terminal interior de cada uno de dicho segundo par de paneles de cuerpo están sujetos a dicho compuesto absorbente en uno de dichos pares de dichas terceras ubicaciones, y en
20 donde dicho compuesto absorbente comprende márgenes laterales opuestos que se extienden lateralmente hacia fuera de cada una de dichas ubicaciones primera y tercera.

4. La invención tal y como se reivindica en la
25 cláusula 1, caracterizada porque dicho margen lateral está formado de dicha hoja inferior.

5. La invención tal y como se reivindica en la cláusula 1, caracterizada porque dicho margen está formado de dicha hoja superior.

5 6. La invención tal y como se reivindica en la cláusula 5, caracterizada porque dicho margen comprende una primera parte de dicha hoja superior doblada sobre una segunda parte de dicho hoja superior, en donde dichas partes primera y segunda dobladas forman una orilla doblada que define dicho
10 orilla libre de dicho margen lateral.

7. La invención tal y como se reivindica en la cláusula 6, caracterizada porque dicho margen lateral además comprende una parte de dicha hoja inferior colocada entre
15 dichas partes primera y segunda de dicha hoja superior.

8. La invención tal y como se reivindica en la cláusula 1, caracterizada porque dicho margen está formado de dicha hoja superior y de la hoja inferior.

20

9. La invención tal y como se reivindica en la cláusula 1, caracterizada porque dicha parte de retención tiene las orillas de lado laterales opuestas, y en donde dicho margen lateral se extiende lateralmente hacia fuera de una de dichas
25 orillas laterales de dicha parte de retención.

10. La invención tal y como se reivindica en la cláusula 1, caracterizada porque dicho margen lateral comprende un elemento elástico que se extiende longitudinalmente.

5 11. La invención tal y como se reivindica en la cláusula 1, caracterizada porque dicho compuesto absorbente comprende márgenes laterales opuestos que se extienden lateralmente hacia fuera sobre cada lado de dicho compuesto absorbente y longitudinalmente desde dicha ubicación que se
10 extiende lateralmente en donde dichos márgenes laterales opuestos terminan en las orillas libres opuestas.

12. La invención tal y como se reivindica en la cláusula 1, caracterizada porque dichas ubicaciones que se
15 extienden longitudinalmente y lateralmente forman un patrón de sujeción de forma de T entre el compuesto absorbente y dicho panel de cuerpo.

13. Una prenda absorbente que comprende:
20

paneles de cuerpo primero y segundo espaciados longitudinalmente cada uno teniendo una superficie del lado al cuerpo; y

25 un compuesto absorbente que tiene una extensión que se prolonga longitudinalmente, un ancho que se extiende lateralmente y las regiones de extremo primera y segunda

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longitudinalmente opuestas y los extremos primero y segundo, dicho compuesto absorbente comprende una hoja inferior, una hoja superior, y una parte de retención colocada ente dicha hoja inferior y dicha hoja superior, en donde dicha primera

5 región de extremo de dicho compuesto absorbente traslapa y está conectada a dicha superficie del lado al cuerpo de dicho primer panel de cuerpo a lo largo de una parte central de dicho compuesto absorbente y a través de una totalidad de dicho ancho de dicho compuesto absorbente en dicho primer extremo del

10 mismo, y en donde dicha segunda región de extremo de dicho compuesto absorbente traslapa y está conectada a dicha superficie del lado al cuerpo de dicho segundo panel de cuerpo a lo largo de una parte central del mismo y a través de una totalidad de dicho ancho compuesto absorbente en dicho segundo

15 extremo del mismo, en dicho compuesto absorbente comprende un par de márgenes de lado lateralmente opuestos terminando en orillas libres exteriores que se extienden longitudinalmente y opuestas y en donde dichos márgenes laterales no están sujetos a dichos paneles de cuerpo primero y segundo y en

20 donde dichas orillas libres que se extienden longitudinalmente se extienden entre las conexiones a través de dicho ancho de dicho compuesto absorbente en dichos extremos primero y segundo y dichos paneles de cuerpo primero y segundo, y en donde dichos márgenes laterales cada uno tienen un ancho relativamente

25 constante entre dicha parte central y dichas orillas libres.

14. La invención tal y como se reivindica en la cláusula 13, caracterizada porque dicho primer panel de cuerpo comprende un primer par de paneles de cuerpo, y en donde cada uno de dichos paneles de cuerpo comprende una orilla terminal exterior y una orilla terminal interior, en donde dicha orilla terminal interior está conectada a dicho compuesto absorbente a lo largo de dicha parte central del mismo.

15. La invención tal y como se reivindica en la cláusula 13, caracterizada porque dichos márgenes laterales están formados de dicha hoja exterior.

16. La invención tal y como se reivindica en la cláusula 13, caracterizada porque dichos márgenes laterales están formados de la hoja superior.

17. La invención tal y como se reivindica en la cláusula 16, caracterizada porque dichos márgenes comprenden cada uno una primera parte de dicha hoja superior doblada sobre una segunda parte de dicha hoja superior, en donde dichas partes primera y segunda dobladas forman una orilla doblada que define dicha orilla libre de dicho margen lateral.

18. La invención tal y como se reivindica en la cláusula 17, caracterizada porque dichos márgenes laterales comprenden además una parte de dicha hoja inferior colocada entre dichas partes primera y segunda hoja superior.

19. La invención tal y como se reivindica en la cláusula 13, caracterizada porque dichos márgenes laterales están formados de dicha hoja superior y de dicha hoja inferior.

5

20. La invención tal y como se reivindica en la cláusula 13, caracterizada porque dichos márgenes laterales comprenden un elemento elástico que se extiende longitudinalmente.

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21. La invención tal y como se reivindica en la cláusula 20, caracterizada porque dicho elemento elástico se extiende a lo largo de sólo una parte de dicho compuesto absorbente.

15

22. La invención tal y como se reivindica en la cláusula 13, caracterizada porque dichas regiones de extremo primera y segunda de dicho compuesto absorbente están conectadas a dichos paneles de cuerpo respectivamente con
20 patrones de sujeción de forma de T.

23. Una prenda absorbente que comprende:

un panel de cuerpo que tiene una superficie del
25 lado al cuerpo; y

un compuesto absorbente que tiene una extensión que se prolonga longitudinalmente, un ancho que se extiende lateralmente y por lo menos una región de extremo traslapando dicho panel de cuerpo, en donde una superficie del lado a la
5 prenda de dicha región de extremo está conectada a dicha superficie del lado al cuerpo de dicho panel de cuerpo con un patrón de sujeción en forma de T.

24. La invención tal y como se reivindica en la
10 cláusula 23, caracterizada porque una parte de dicha región de extremo traslapante de dicho compuesto absorbente no sujetado a dichos paneles de cuerpo primero y segundo en dicho patrón de sujeción de forma de T forma un margen lateral teniendo una orilla libre.

15

25. La invención tal y como se reivindica en la cláusula 23, caracterizada porque dicho panel de cuerpo comprende los paneles de cuerpo primero y segundo cada uno teniendo una superficie del lado al cuerpo y en donde dicha
20 región de extremo de dicho compuesto absorbente comprende una primera región de extremo traslapando dicho primer panel de cuerpo y una segunda región de extremo traslapando dicho segundo panel de cuerpo, en donde una superficie lateral de prenda de dichas regiones de extremo primera u segunda están
25 conectadas a dicha superficie del lado al cuerpo de dichos paneles de cuerpo primero y segundo con un par de patrones de sujeción de forma de T.

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26. La invención tal y como se reivindica en la cláusula 25, caracterizada porque los patrones de sujeción de forma de T se extienden a lo largo de una parte central de dicho compuesto absorbente y a lo largo de la totalidad de dicho ancho de dicho compuesto absorbente en un primero y en un segundo extremo de dicho compuesto absorbente.

27. La invención tal y como se reivindica en la cláusula 25, caracterizada además porque comprende un elemento elástico que se extiende a lo largo de las orillas opuestas de dicho compuesto absorbente entre dichas regiones de extremo del mismo.

28. La invención tal y como se reivindica en la cláusula 27, caracterizada porque dichos elementos elásticos se extienden a lo largo de sólo una parte de dicha longitud de dicho compuesto absorbente a lo largo de dichas orillas opuestas del mismo.

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La prenda absorbente comprende un panel de cuerpo y un compuesto absorbente que tiene una extensión que se prolonga longitudinalmente y un ancho que se extiende lateralmente y comprende una hoja inferior, una hoja superior y una parte de retención colocada entre la hoja inferior y la hoja superior. El compuesto absorbente está conectado al panel de cuerpo y comprende un margen lateral que no está sujeto al panel de cuerpo y que se extiende lateralmente hacia fuera y termina en una orilla libre. En una incorporación preferida, la orilla libre no se extiende a lo largo de la totalidad de la longitud del compuesto absorbente. Más bien, el ancho completo de un extremo del compuesto absorbente está asegurado al panel de cuerpo. Preferiblemente, el ancho del margen lateral a lo largo del compuesto absorbente traslapando el panel de cuerpo es relativamente constante.

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FIG.1

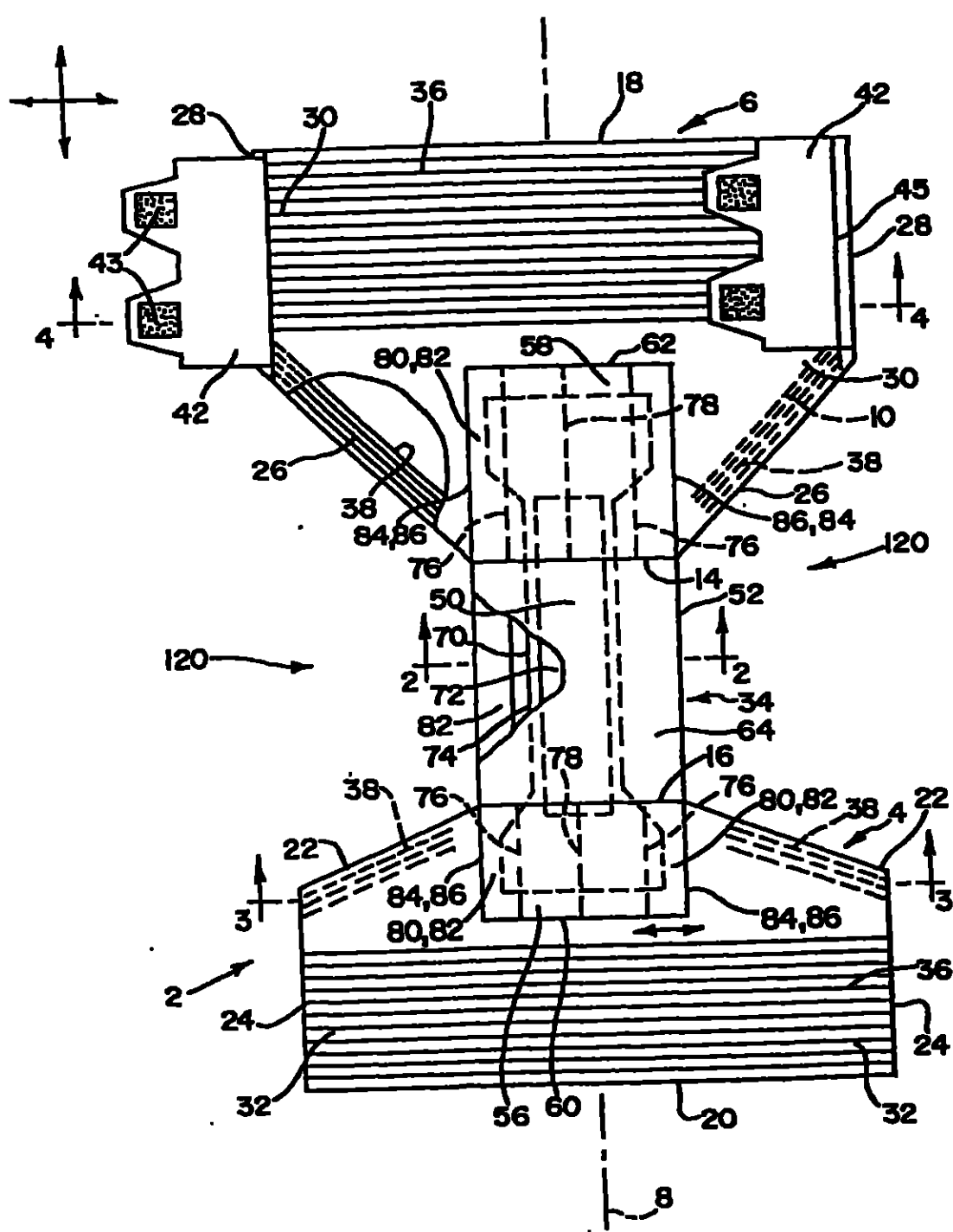


FIG.2

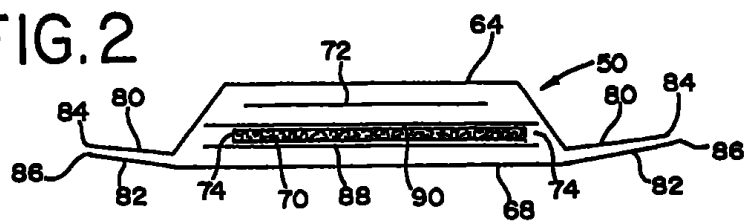


FIG.3

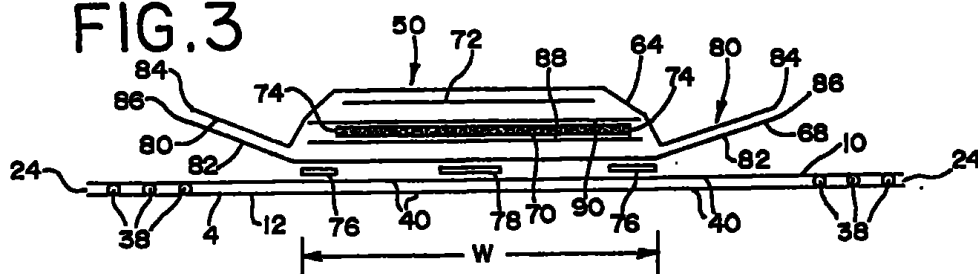
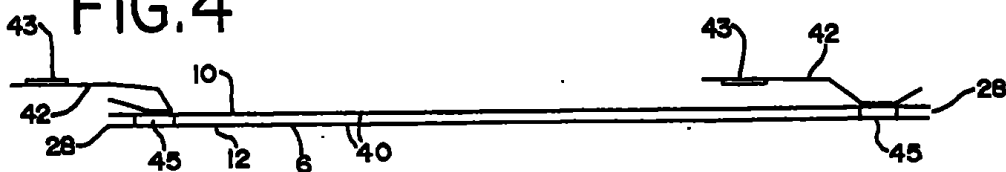


FIG.4



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FIG.5

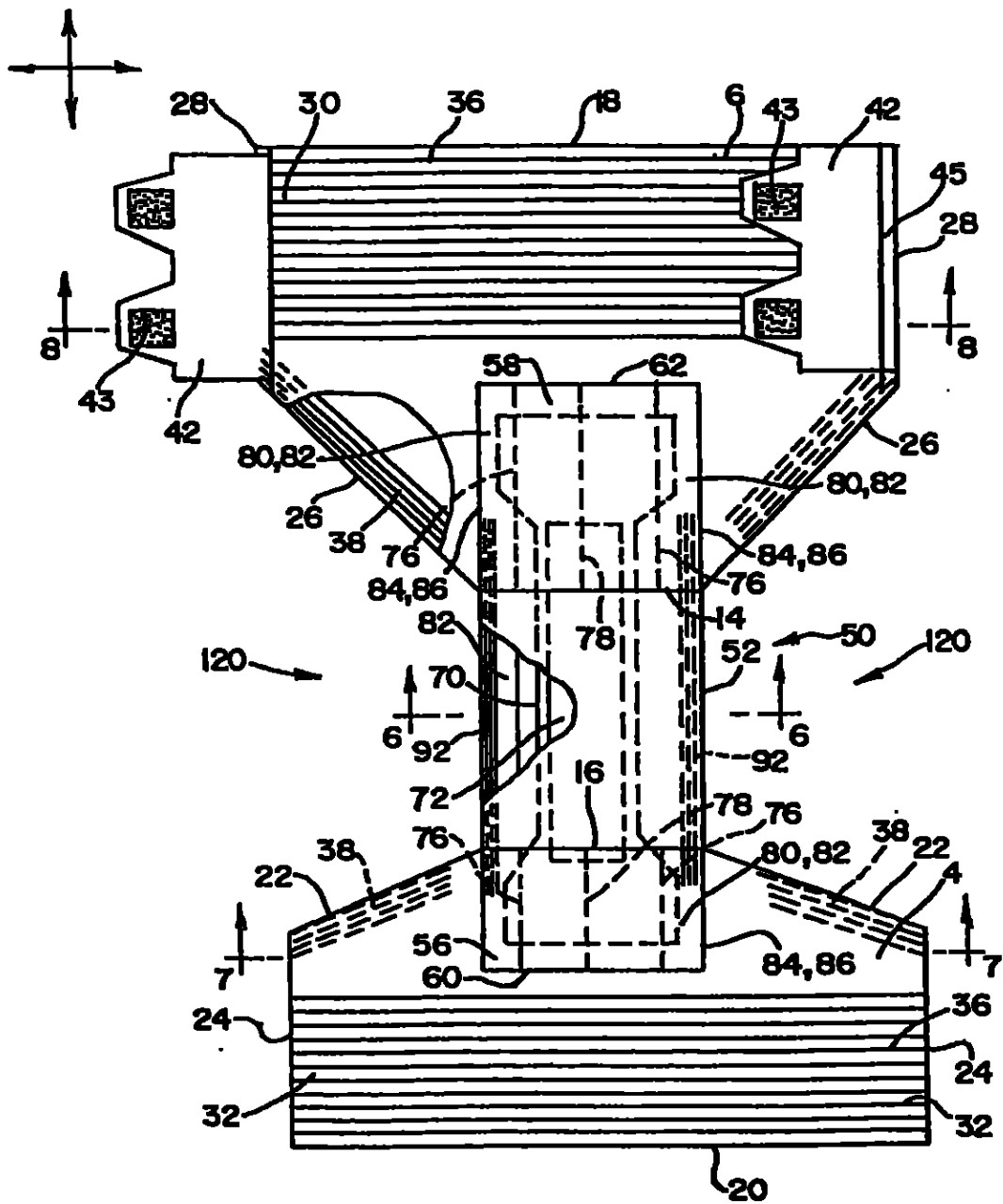


FIG.6

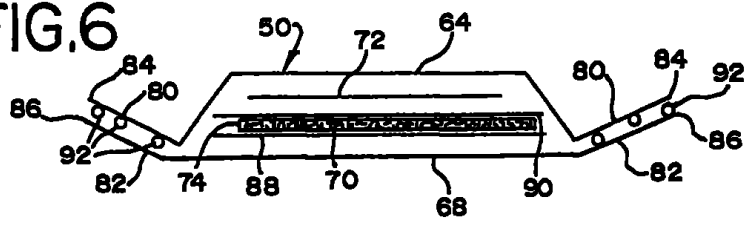


FIG.7

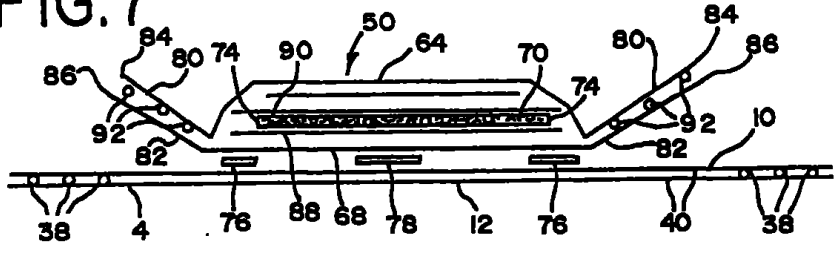
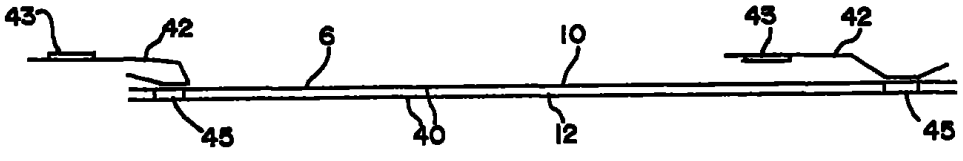


FIG.8



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FIG.10

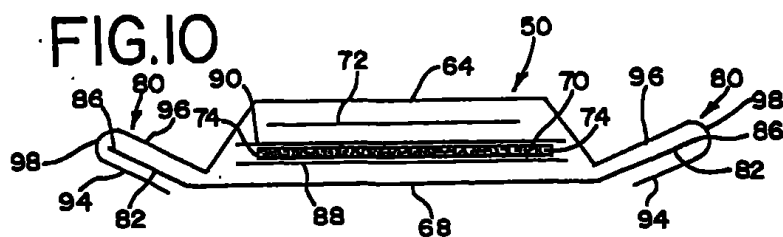


FIG.11

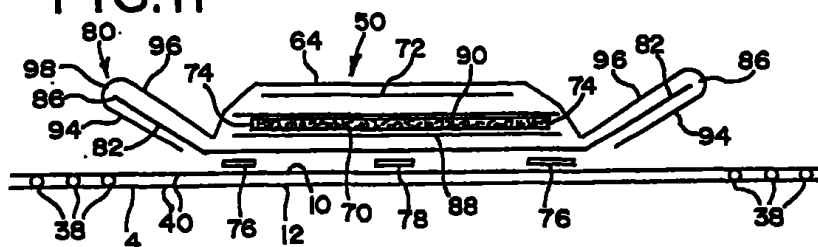
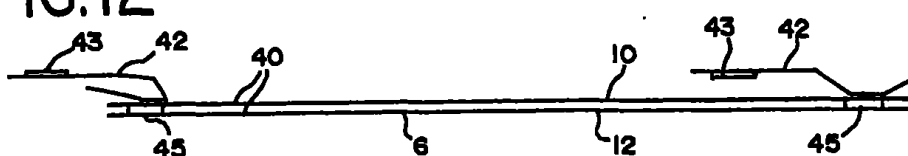


FIG.12



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FIG.13

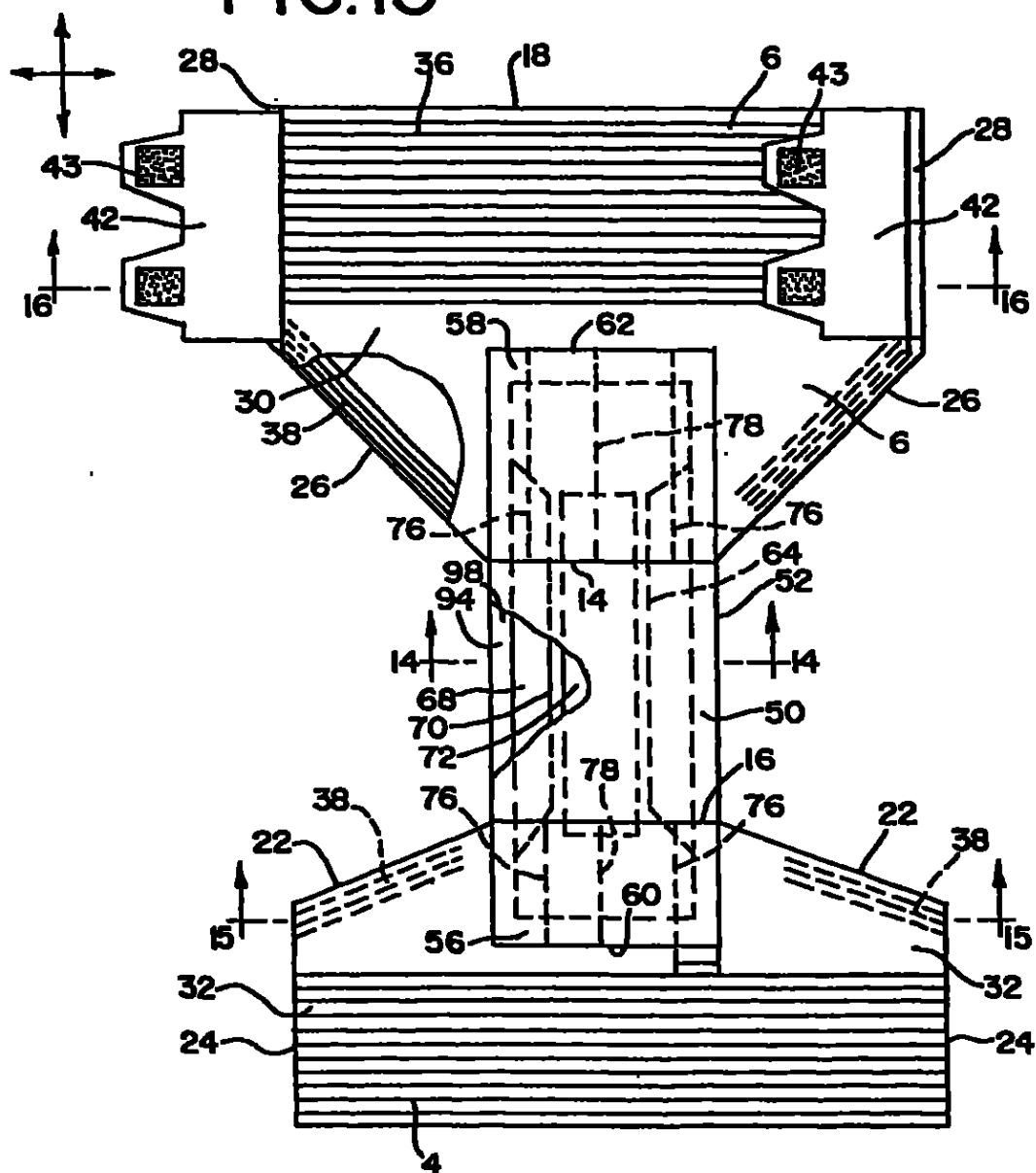


FIG.14

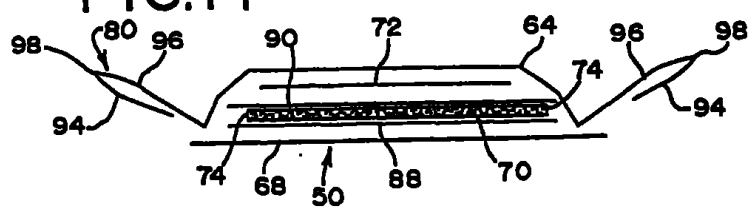


FIG.15

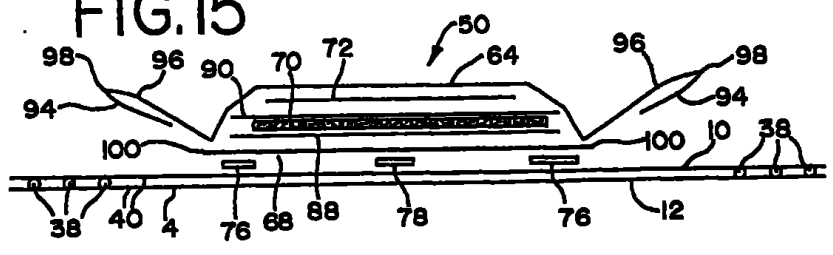
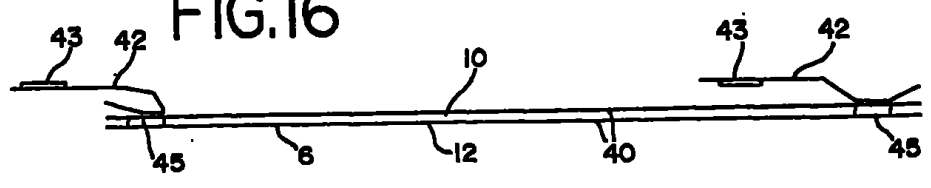


FIG.16



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FIG. 17

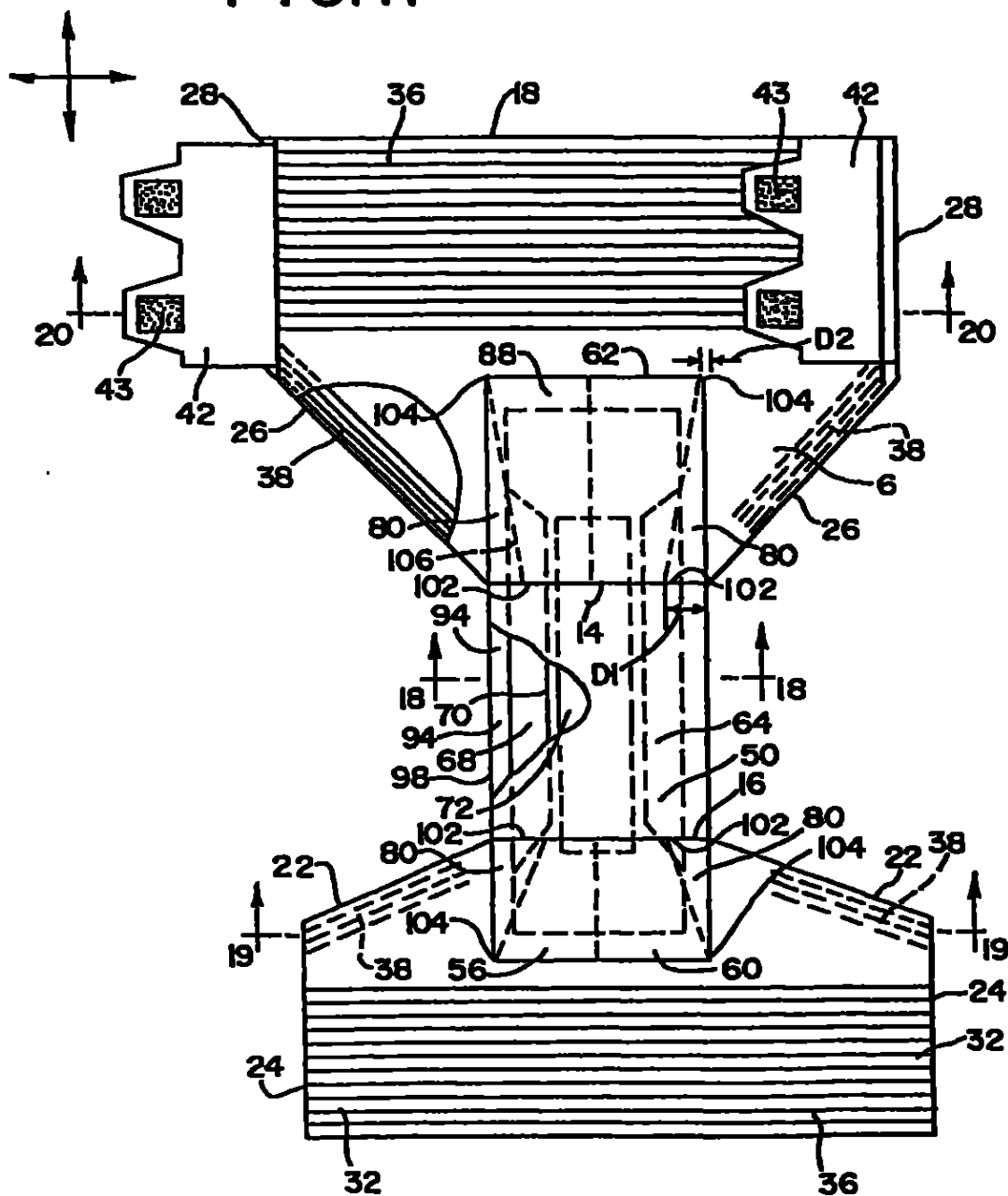


FIG.18

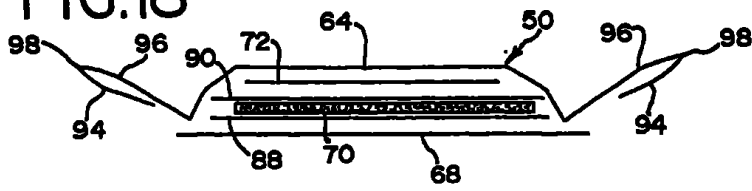


FIG.19

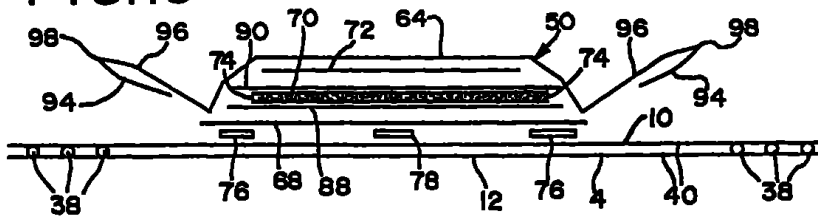
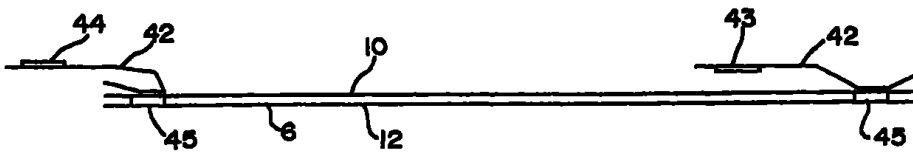


FIG.20



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FIG.21

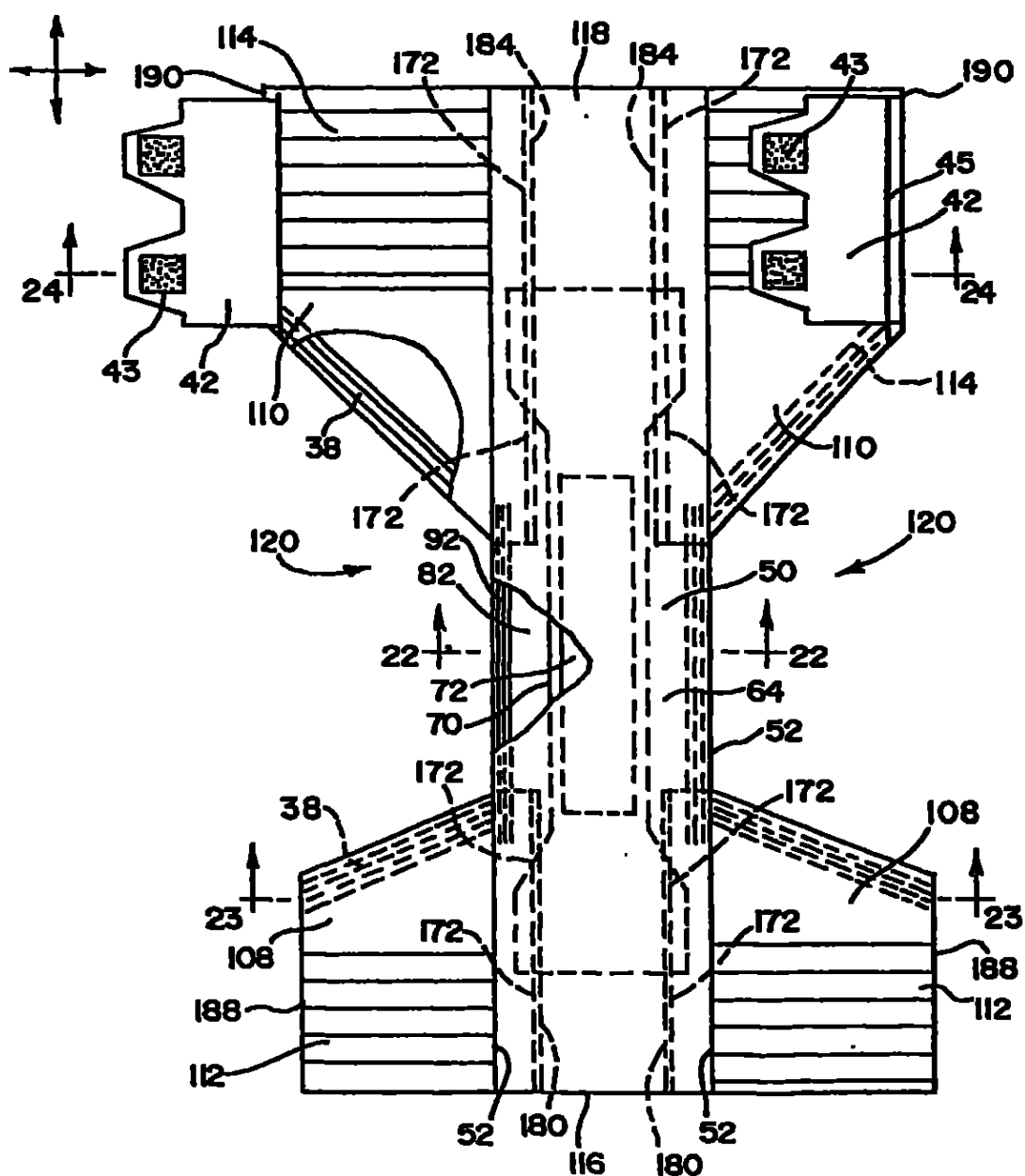


FIG.22

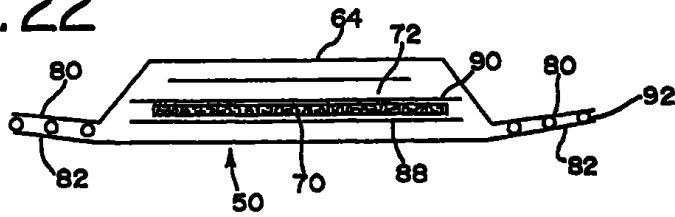


FIG.23

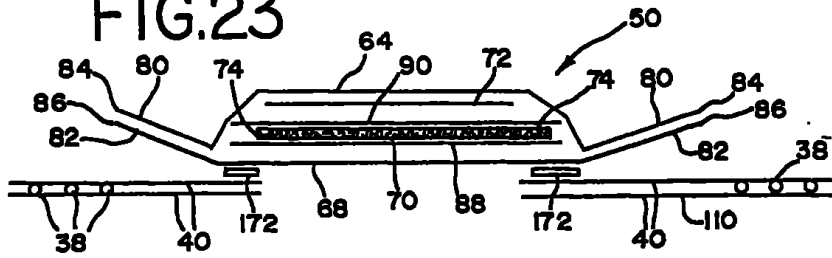
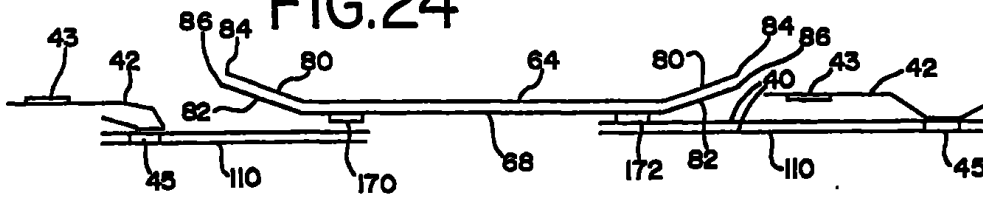


FIG.24



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FIG.25

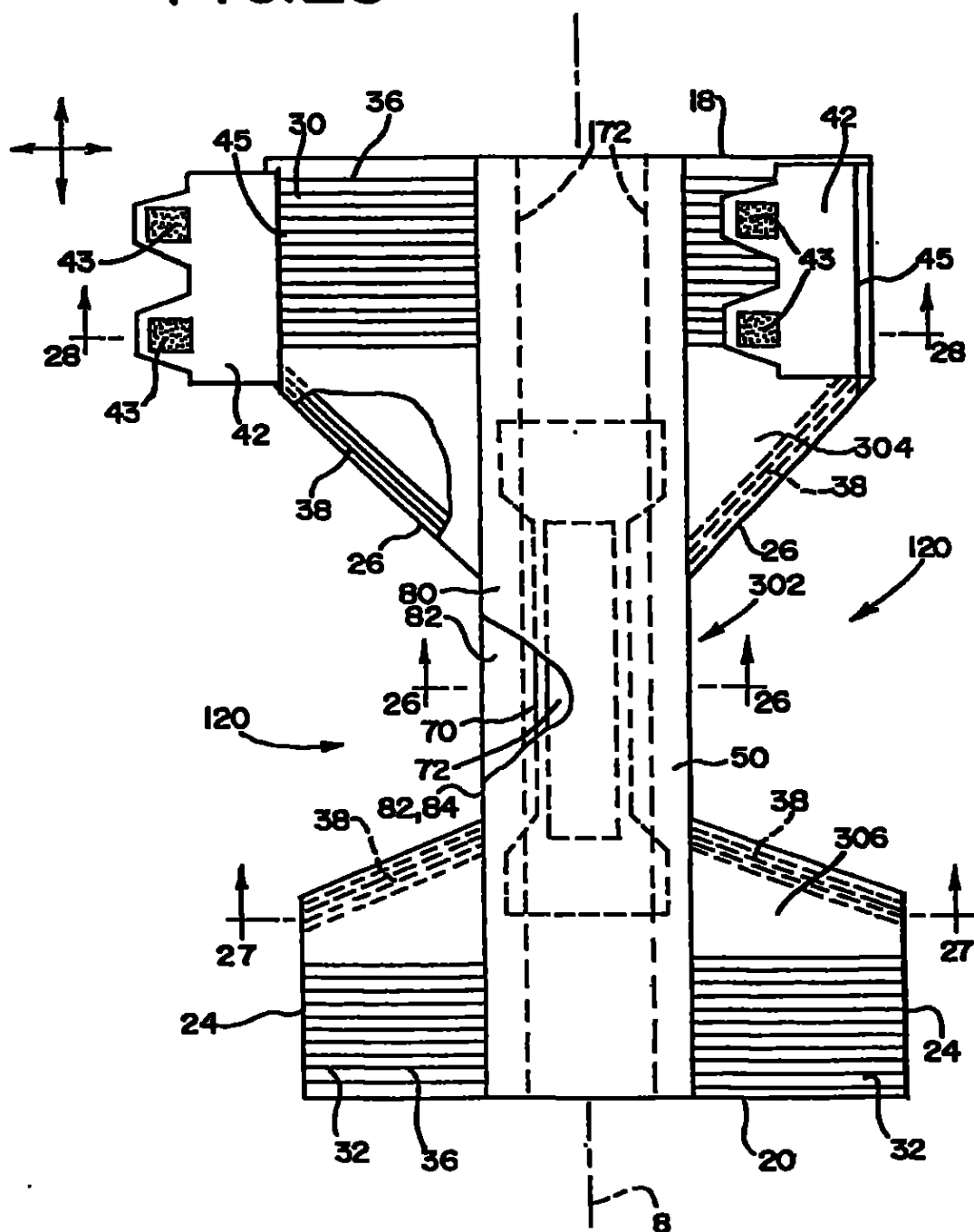


FIG.26

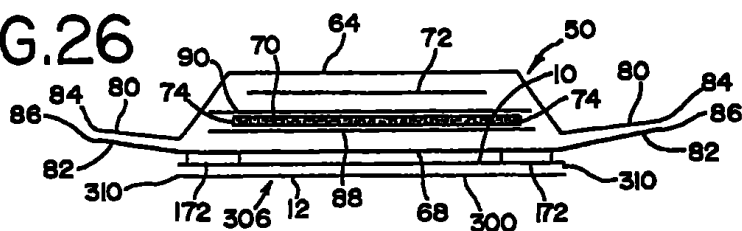


FIG.27

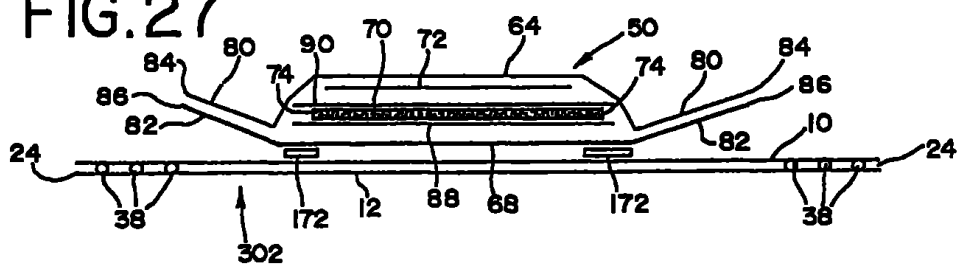
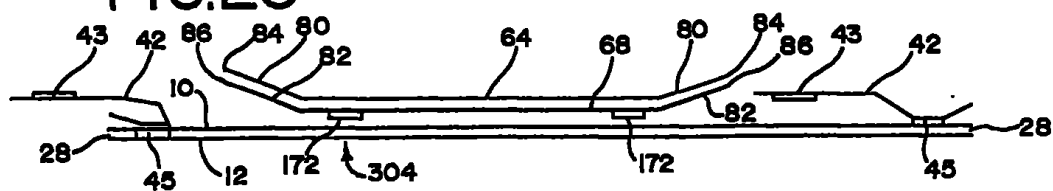


FIG.28



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FIG.29

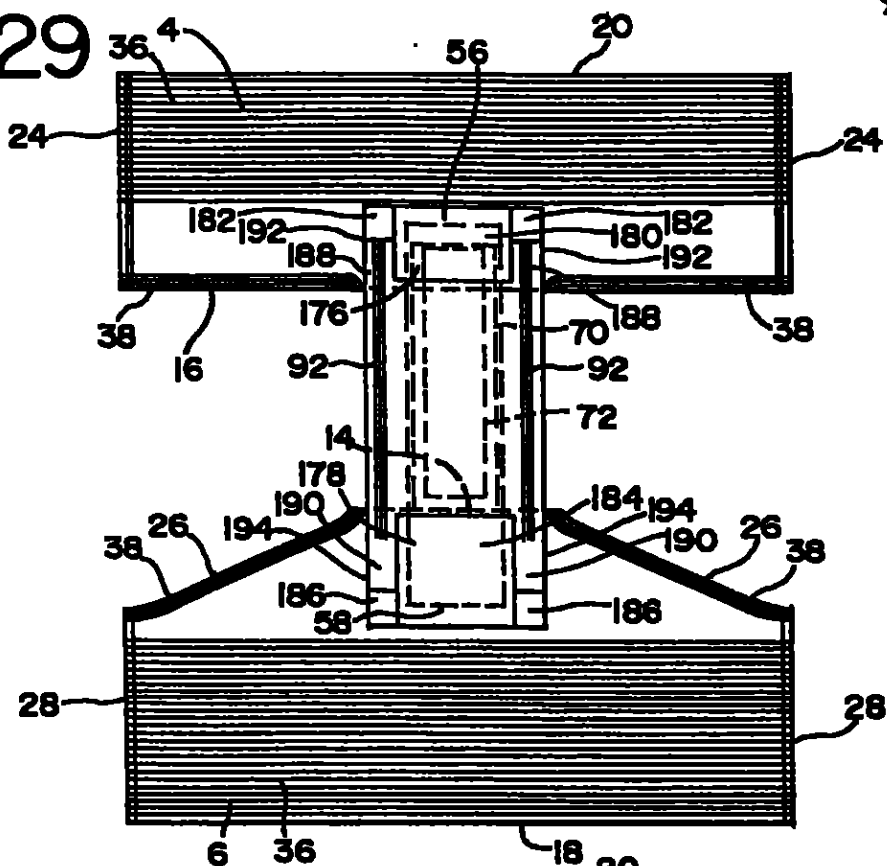
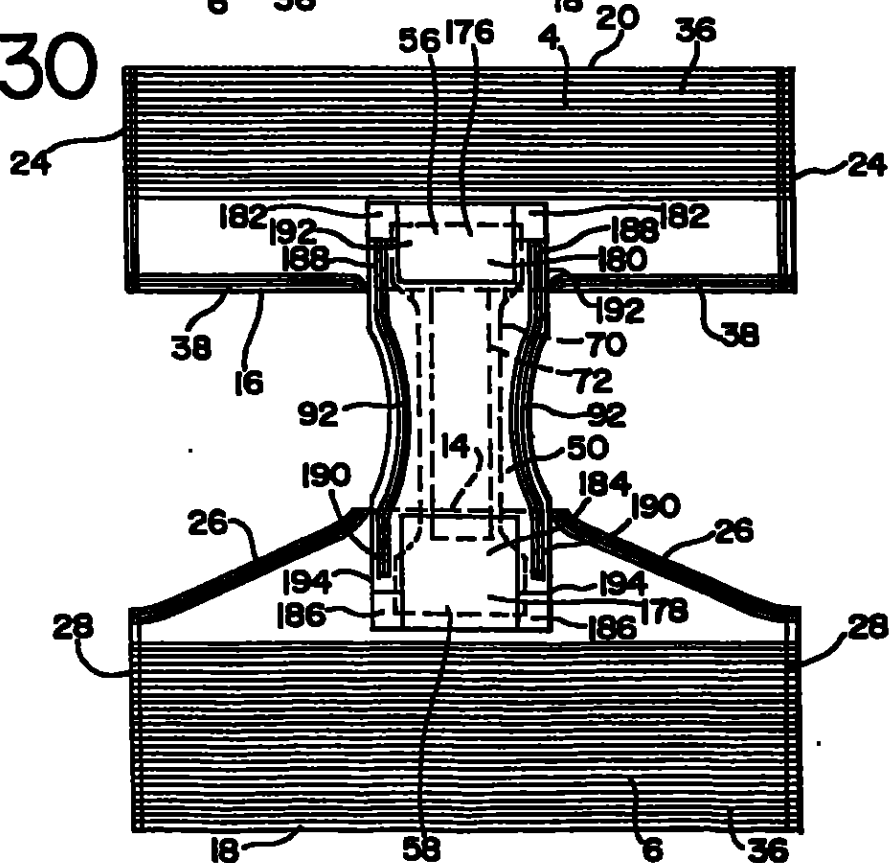


FIG.30



PATENT COOPERATION TREATY

104
L

from the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

WRITTEN OPINION

(PCT Rule 66)

To: **ANDREW D. STOVER**
BRINKS HOFER GILSON & LIONE
NBC TOWER-SUITE 3800
455 NORTH CITYFRONT PLAZA DRIVE
CHICAGO, ILL. 60611

Date of Mailing
(day/month/year) **31 JUL 2003**

Applicant's or agent's file reference 659/882		REPLY DUE within TWO months from the above date of mailing
International application No. PCT/US02/26702	International filing date (day/month/year) 22 AUGUST 2002	Priority date (day/month/year) 02 NOVEMBER 2001
International Patent Classification (IPC) or both national classification and IPC IPC(7): A 61 F 15/15, 15/20 and US Cl: 604/885.25, 894, 897, 898		
Applicant KIMBERLY-CLARK WORLDWIDE, INC.		

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.3(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
 For the examiner's obligation to consider amendments and for arguments, see Rule 66.5.
 For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 66.8 is 02 MARCH 2004

Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20531	Authorized Officer K. M. REICHLER <i>Diana Smith</i>
Facsimile No. (703) 305-3220	Telephone No. 703-308-0858

WRITTEN OPINION

International application No:

PCT/US02/26702

I Basis of the opinion

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☒ the description:

pages 1-26 , as originally filed

pages NONE , filed with the demand

pages NONE , filed with the letter of

☒ the claims:

pages 27-32 , as originally filed

pages NONE , as amended (together with any statement) under Article 19

pages NONE , filed with the demand

pages NONE , filed with the letter of

☒ the drawings:

pages 1-15 , as originally filed

pages NONE , filed with the demand

pages NONE , filed with the letter of

☒ the sequence listing part of the description:

pages NONE , as originally filed

pages NONE , filed with the demand

pages NONE , filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages none

☒ the claims, Nos. none

☒ the drawings, sheets/fig. none

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".

WRITTEN OPINION

International application No.

PCT/US02/26702

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement

1. statement

Novelty (N)	Claims 3, 6-7, 14 and 17-18	YES
	Claims 1-2, 4-5, 8-13, 15-16, 19-28	NO
Inventive Step (IS)	Claims 3, 14	YES
	Claims 1-2, 4-13, 15-28	NO
Industrial Applicability (IA)	Claims 1-28	YES
	Claims none	NO

2. citations and explanations

Claims 1-2, 4-5, 8-11, 13, 15-16 and 19-21 lack novelty under PCT Article 33(a) as being anticipated by WATANABE et al GB '181.

See Figures 2-4 of Watanabe, the body panel is 2, the first and second body panels are the panel with flaps 8 and the panel with flaps 9 which panels are longitudinally spaced apart by a undenoted crotch portion, the absorbent composite is 3, the topsheet is 15, the backsheet is 16, the retention portion is 17, the side margins are 18, the elastic elements are 4, the first location, the third location and the center portion are A, see page 6, first full paragraph, the second location, the fourth location and the connection across an entirety of the width are the connections adjacent the ends of 3 one of which is adjacent the line from 3 in Figure 2. With regard to claims 2 and 13 it is noted that none of the claims require only the composite extending between the panels, or, in other words, the panels are not required to be discrete. Note claim 3 and the definition of the edges therein and that claims 2 and 13 do not claim similar structure with regard to the body panels therein.

Claims 1-2, 4-5, 8-13, 15-16 and 19-28 lack novelty under PCT Article 33(a) as being anticipated by SAISAKA et al '424.

See Figures 3-5 and 12, col. 4, lines 59 et seq. col. 5, lines 1-17 and 59-64, col. 9, lines 49-50 and col. 12, lines 8-24, the panel is 2, the first and second body panels are 4 and 5 and they are longitudinally spaced by crotch portion 6, the absorbent composite is 3, the width is the distance between the vertical lines extending between 2 and 3 in Figure 3, the first location, the third location and the center portions are the portions of 34 in panels 4 and 5, the second location, fourth location and the connection across the entirety of the width are 35 in each of the panels 4 and 5, the T-shaped attachment patterns are 34 and 35 in each of the panels 4 and 5, the topsheet is 14, the backsheet is 13, the retention portion is 15, (Continued on Supplemental Sheet.)

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The drawings are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or content thereof: The drawings are objected to because in Figure 1, a line from each of the numerals 80-86 to the structure it denotes should be set forth. The lines from 86, 14, 16, and 88 should be dashed to denote underlying structure. The elements 14, 16, 86 should also be shown as dashed to denote that they are underlying structure. The line from 86 on the left should extend to the edge not the elastics. The line from 10 should not be dashed. Where is the surface 10 of the front panel, see page 6, lines 9-11? These objections also apply to similar structure in Figures 5, 9, 13, 17, 25 and 29-30. Additionally, in Figure 9, the line from the right 88 does not denote the edge. The line from 98 does not denote the folded edge. The line from 94 should not be dashed. In Figure 17, 88 should be 58. In Figure 21, the line from the right 114 should not be dashed and should denote the ear. Also, where are 186 and 152, see page 7, lines 13-16? In Figure 25, the line from 45 does not denote the connection. The numerals 302 and 308 have been reversed. Where is 300, see page 23, line 28? In Figures 29 and 30, the lines from the numerals 38, 39, 176, 178, 180, 182, 184 and 186 and the elements so denoted should be dashed to indicate underlying structure.

In Figure 9, the right 74 should denote the edge of 70. In Figure 9, the arrow from 80 should be a line. In Figure 7, 60 does not denote the correct structure. In Figure 22, 78 does not denote the correct structure. In Figure 23, 86 and 88 do not denote the correct structure. In Figure 24, 170 should be 172. Also the invention as claimed in claims 8 and 14 should be shown or the claims cancelled.

The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof: The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Cooperation is requested in correcting any errors of which applicant may become aware in the specification.

For example:

The abstract of the disclosure is objected to because the legal terminology, i.e. "comprises", "comprising", should be avoided. Correction is required. See MPEP § 808.01(b). Also the numeral used to describe each feature in the Figures should be placed between parentheses after each feature is textually described.

The use of the trademark VELCRO(R)(page 7), HUGOBOS(R)(page 15) has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

(Continued on Supplemental Sheet.)

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VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 2-3, 6-7, 11, 13-22 and 24 are objected to under PCT Rule 68.2(a)(v) as lacking clarity under PCT Article 6 because the claims are indefinite for the following reason(s): In claim 2, are the first and second locations set forth on lines 8-11 and the locations set forth in claim 1 one and the same, i.e. how many connection locations at a minimum is Applicant claiming? In regard to claim 3, it is unclear how the second and fourth locations relate to the pairs of panels. In claim 6, positive antecedent basis for "folded first and second portions" should be established. In regard to claim 11, are one of the side margins and free edges in this claim and those set forth in claim 1 one and the same, i.e. how many margins and free edges at a minimum is Applicant claiming? In claim 13, lines 9-15 and 20-22, since a connection across the entirety of the width of the absorbent composite at the first and second ends includes the center portion thereof, it is unclear whether the claimed center portion at the first and second ends and such are one and the same, i.e. how many connections are there at a minimum and where are they located? Therefore, a clear antecedent basis for the side margins, which are not attached to the panels, having a constant width between the center portion and the free edges should also be defined. Lines 13-20 are unclear, i.e. should "and said first ..panels" be deleted? In regard to claim 14, clear antecedent bases for "said ..edge" and "said center portion" should be established. Again, it is unclear how the connections across the entirety of the width relate to the pairs of body panels. In regard to claim 17, see discussion of claim 6. Also, positive antecedent bases for "said free edge" and "said side margin" should be established. In claim 22, are the T-shaped attachment patterns and the respective connections along the center portion and entire width of the first and second ends in claim 13 one and the same, i.e. how many connections are there at a minimum? In regard to claim 24, a positive structural antecedent basis for "said first and second body panels" should be set forth.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):

the margins are the portions of 13 and 14 making up side edges and 17, the elastic members are 18. With regard to claims 2, 13 and also now claims 24-25, see discussion in previous rejection.

Claims 6-7 and 17-18 lack an inventive step under PCT Article 33(3) as being obvious over WATANABE '131 in view of SAGESER.

These claims require the side margins to include a folded portion of the topsheet with a portion of the backsheet disposed therebetween. See Figure 3 of Watanabe and Figures 2 and 5a of Sageser. To make the side margins of Watanabe as claimed instead would not involve an inventive step in view of the interchangeability as taught by Sageser.

Claims 3 and 14 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest four panels having the locations of connections as set forth in claims 3 and 14.

NEW CITATIONS

✓ GB 2 253 131 A (WATANABE et al) 09 FEBRUARY 1992, see Figures 2-4 and page 6, first full paragraph.

✓ US 5,624,424 A (SAISAKA et al) 29 APRIL 1997, see Figures 3-5 and 13, col. 4, lines 59 et seq, col. 5, lines 1-17 and 59-64, col. 9, lines 42-50 and col. 12, lines 8-24.

WO 96/14815 A1 (SAGESER) 23 MAY 1996, see Figures 2-6.

VII. CERTAIN DEFECTS IN THE APPLICATION (Continued):

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks. Trademarks should be denoted by either all capital letters or a trademark symbol.

The Summary of the Invention section, i.e. a description of the claimed invention, and the invention of the claims are not commensurate, see MPEP 608.01(d) and 1302.01.

The descriptions of Figures 1, 5, 9, 13, 17, 21 and 25 on pages 3-5 are incomplete, i.e. the Figures are partly cutaway.

On page 12, line 31, is Triton a trademark? If so, it should be properly denoted as such.

In the Figures, e.g., Figure 3, what is 12? In Figure 15, what is 100?

Appropriate correction is required.

Claims 2-22 and 24-28 are objected to under PCT Rule 66.2(a)(ii) as containing the following defect(s) in the form or contents thereof: in claim 2, line 1, "a" should be deleted. In claims 2-12, 14-22 and 24-28, line 1, "invention" should be --garment--. In claim 13, line 2, "a"(1st) should be deleted and "panel" should be --panels--. On line 6, "and"(1st) should be --having respective--. On line 17, after, "edges", --respectively,-- should be inserted. In claim 20, after "margins", --each-- should be inserted. In claim 21, line 1, "said" should be --each--. In claim 25, line 1, "a" should be deleted and on line 2, "panel" should be --panels--. In claim 26, line 3, after "first", --and-- should be inserted. In claim 27, line 1, "an elastic element" should be --respective elastic elements--. In claim 3, lines 8 and 10, "pairs" should be --pair--. On line 7, "edges" should be --edge--. Appropriate correction is required.

"Express Mail" Mailing Label EV 327 133 091 US
Date of Deposit September 25, 2003

Patent
Case No. 659-982
Client No. 17585

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PRELIMINARY EXAMINATION AUTHORITY FOR INTERNATIONAL
PATENT APPLICATIONS FILED UNDER THE PATENT COOPERATION
TREATY**

Applicant: Kimberly-Clark Worldwide, Inc.)
)
International) Authorized Officer: K.M. Reichle
Application No. PCT/US02/26702)
)
International)
Filing Date: August 22, 2002)
)
For: ABSORBENT GARMENT HAVING A)
BODY CONFORMING ABSORBENT)
COMPOSITE)

REPLY TO WRITTEN OPINION

Mail Stop PCT
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: IPEA/US

Dear Sir:

In response to the Written Opinion mailed July 31, 2003, please enter the following reply.

IN THE ABSTRACT:

Please substitute replacement page 31 for the abstract (originally page 33).
The following changes have been made to the abstract on the substitute page:

An absorbent garment ~~emprises~~ includes a body panel and an absorbent composite having a longitudinally extending length and a laterally extending width and ~~emprising~~ including a backsheet, a topsheet and a retention portion disposed

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GZ

between the backsheet and the topsheet. The absorbent composite is connected to the body panel and ~~comprises~~ includes a side margin that is not attached to the body panel and that extends laterally outboard and terminates in a free edge. In one preferred embodiment, the free edge does not extend along the entirety of the length of the absorbent composite. Rather, the entire width of an end of the absorbent composite is secured to the body panel. Preferably, the width of the side margin along the portion of the absorbent composite overlapping the body panel is relatively constant.

IN THE DESCRIPTION:

Please substitute replacement pages 3-26 for original pages 3-26 in the specification. The following changes have been made with reference to the original pages:

The paragraph beginning at page 3, line 16 has been amended as follows:

FIGURE 1 is a plan view of a first embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 3, line 24 has been amended as follows:

FIGURE 5 is a plan view of a second embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 4, line 1 has been amended as follows:

FIGURE 9 is a plan view of a third embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 4, line 9 has been amended as follows:

FIGURE 13 is a plan view of a fourth embodiment of an absorbent garment

taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 4, line 17 has been amended as follows:

FIGURE 17 is a plan view of a fifth embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 4, line 25 has been amended as follows:

FIGURE 21 is a plan view of a sixth embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 5, line 3 has been amended as follows:

FIGURE 25 is a plan view of a ~~sixth~~ seventh embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

The paragraph beginning at page 6, line 9 has been amended as follows:

Referring to FIGS. 1, 3, 4, 5, 9, 13, 17, 20 and 21, an absorbent garment 2 includes a first, front body panel 4 and a second, rear body panel 6. The first and second body panels each have an inner, bodyside surface 10 an outer, garment side 12 surface and a length, which is less the overall length of the absorbent garment. Each of the first and second body panels has a first and second longitudinally opposed terminal end edges 16, 14, 20, 18, and outer side edges, including a tapered edge 22, 26 and an outboard edge 24, 28 formed along the outer periphery of laterally opposed ear portions 30, 32. Alternatively, as shown in FIGS. 29 and 30, the front body panel does not include a tapered side edge, but rather the terminal end edge extends The first terminal edges 14, 16 of the first and second body panels are longitudinally spaced to form an opening 34 therebetween in the crotch region of the garment, while the

second terminal edges 20, 18 of the first and second body panels form front and back waist edges respectively. A plurality, meaning two or more, of laterally extending elastic elements 36 can be secured to each of the first and second body panels.

Likewise, one or more leg elastic elements 38 can be secured along the tapered side edge of the body panels to form a gasket with the leg of the user. For example, as shown in FIGS. 1-4, each panel can be made of an elasticized composite panel material comprising two non-woven substrates 40 with the plurality of elastic strands 38, 36 sandwiched therebetween. The elastic strands are positioned in the waist regions and along the leg perimeters. A portion of the leg elastic elements 38 can extend under a side margin of an absorbent composite 50. The placement of the panel leg elastic elements further inward along the side edge provides for improved fit and performance of the garment.

The paragraph beginning at page 7, line 20 has been amended as follows:

Referring to FIGS. 1, 5, 9, 13, 17 and 21, fastening tabs 42 are attached and extend laterally from the outboard edge 28, 190 of the rear body panels from an attachment location 45. It should be understood that the fastening tabs could be affixed to the front body panels or to both the front and rear body panels. For the purposes of illustration, the right side tab 42 is shown as being folded in during manufacture, while the left side tab 42 is shown as being extended outboard during use. The fastening tabs can be made of a hook and loop combination, such as a ~~VELCRO~~ Velcro® fastening system, or can have adhesive or other bonding agents applied to one surface thereof. Various hook configurations are described in U.S. Patent No. 5,845,375 to Miller et al., U.S. Patent No. 6,132,660 to Kampfer, U.S. Patent No. 6,000,106 to Kampfer, U.S. Patent No. 5,868,987 to Kampfer, U.S. Patent No. 4,894,060 to Nestegard, and U.S. Patent No. 6,190,594 B1 to Gorman, the entire disclosures of which are incorporated by reference herein. Some examples of suitable hook fasteners are the various CS600 hook fasteners manufactured by Minnesota Mining and Manufacturing Co., St. Paul Minn.

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X

The paragraph beginning at page 12, line 24 has been amended as follows:

The topsheet fabrics may be composed of a substantially hydrophobic material, and the hydrophobic material may optionally be treated with a surfactant or otherwise process to impart a desired level of wettability and hydrophilicity. In a particular embodiment of the invention, topsheet 64 is a nonwoven, spunbond polypropylene fabric composed of about 2.8 - 3.2 denier fibers formed into a web having a basis weight of about 22 gsm and density of about 0.06 gm/cc. The fabric can be surface treated with an operative amount of surfactant, such as about 0.28% Triton® X-102 surfactant. The surfactant can be applied by any conventional means, such as spraying, printing, brush coating or the like.

The paragraph beginning at page 13, line 17 has been amended as follows:

In other alternative constructions, the backsheet can comprise a woven or nonwoven fibrous web layer, which is treated or constructed, partially or wholly, to impart the desired levels of liquid impermeability to selected regions that are adjacent to or proximate the absorbent retention portion. For example, the backsheet may include a gas-permeable, nonwoven fabric layer laminated to a polymer film layer which may or may not be gas-permeable. Other examples of fibrous, cloth-like backsheet materials can comprise a stretch thinned or stretch thermal laminate material composed of a 0.6 mil (0.015 mm) thick polypropylene cast film and a 0.7 ounce per square yard (23.8 gsm) polypropylene spunbond material (2 denier fibers). A material of this type has been employed to form the outercover of a HUGGIES Huggies® Ultratrim Disposable Diaper, which has been commercially available from Kimberly-Clark Corporation. The backsheet 68 typically provides the outercover of the article. Optionally, however, the article may include a separate outercover component member which is additional to the backsheet. The outercover can be joined, for example, to one or more of the absorbent composite and/or body panels.

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The paragraph beginning at page 22, line 26 has been amended as follows:

In the embodiments shown in FIGS. 5-8, 29 and 30, one or more elastic elements 92, shown as ~~there three~~, are secured in the side margins ~~84, 86~~ 80, 82 between the topsheet and backsheet, and extend longitudinally along a portion of the side margins on each side of the absorbent composite. Preferably, the elastic elements extend along the side margins of the absorbent composite between the body panels and overlap a portion of each body panel 4, 6. The length of the elastic elements is preferably between about 5% and 100% of the length of the absorbent composite. For example, as shown in FIG. 29, the elastic elements extend along the side margins from the lateral attachment location at the end of the absorbent composite secured to the front body panel across the terminal edge of the rear body panel. The function of the elastic elements in the side margins of the absorbent composite are to shorten the length of the side margin which pulls the side margins inwardly to form a three-dimensional profile so as to seal or gasket against the body of the user. At the same time, in the embodiments of FIGS. 17, 29 and 30, the attachment of the absorbent composite at the four corners prevents the side margins from being folded or drawn over the absorbent area. In addition, assembly of the garment is facilitated since the absorbent composite lies flat when the elastic elements are stretched in the machine direction. The elastic elements can be positioned at various laterally spaced positions, depending on the amount of shortening and upward lift desired. The elastic elements can be made of ribbon, films, sprays of elastic, or other elastic configurations known in the art. It should be understood that elastic elements can be incorporated into any of the other side margin configurations described herein.

IN THE DRAWINGS:

Please substitute replacement sheets 1-14 for original sheets 1-14 of the drawings. Applicant has provided additional reference lines and corrected various informalities noted by the Examiner in the outstanding Written Opinion.

IN THE CLAIMS:

Please substitute replacement pages 27-30 for original pages 27-32 in the claims. Claims 1-12 and 23-28 have been cancelled without prejudice and claims 13-22 have been amended and claims 29-30 added as follows:

Claims 1-12 (Cancelled).

13. (Currently Amended) An absorbent garment comprising:

a-longitudinally spaced first and second body panel panels each having a bodyside surface, a terminal waist edge and a terminal crotch edge, wherein said crotch edges of said first and second body panels are longitudinally spaced apart and define a gap therebetween and wherein said waist edges of said first and second body panels are longitudinally spaced apart; and

an absorbent composite having a longitudinally extending length, a laterally extending width and longitudinally opposed first and second end regions having respective and first and second ends, said absorbent composite comprising a backsheet, a topsheet and a retention portion disposed between said backsheet and said topsheet, wherein said absorbent composite bridges said gap between said crotch edges of said first and second body panels and wherein said first end region of said absorbent composite overlaps and is connected to said bodyside surface of said first body panel along a longitudinally extending center portion thereof and across an entirety of said width of said absorbent composite at said first end thereof, and wherein said second end region of said absorbent composite overlaps and is connected to said bodyside surface of said second body panel along a longitudinally extending center portion thereof and across an entirety of said width of said absorbent composite at said second end thereof, wherein said absorbent composite comprises a pair of laterally opposed side margins terminating in opposite, longitudinally extending outboard free edges, respectively, wherein said side margins are not attached to said first and second body panels and wherein said longitudinally extending free edges extend between the connections across said width of said absorbent composite at said first and second ends thereof and said crotch edges of said first and second body panels respectively ~~said first and second body panels~~, and wherein said side margins

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each have a relatively constant width between said center portion and said free edges.

14. (Currently Amended) The absorbent garment invention of claim 13 wherein said first body panel comprises a first pair of side body panels and wherein said second body panel comprises a second pair of side body panels, wherein each of said side body panels comprises an outboard terminal edge and an inboard terminal edge, wherein said inboard terminal edge is connected to said absorbent composite along said center portion thereof.

15. (Currently Amended) The absorbent garment invention of claim 13 wherein said side margins are formed from said backsheet.

16. (Currently Amended) The absorbent garment invention of claim 13 wherein said side margins are formed from said topsheet.

17. (Currently Amended) The absorbent garment invention of claim 16 wherein side margins each comprise a first portion of said topsheet folded over a second portion of said topsheet, wherein said folded first and second portions form a folded edge defining said free edge of said side margin.

18. (Currently Amended) The absorbent garment invention of claim 17 wherein said side margins further comprise a portion of said backsheet disposed between said first and second portions of said topsheet.

19. (Currently Amended) The absorbent garment invention of claim 13 wherein said side margins are formed from said topsheet and said backsheet.

20. (Currently Amended) The absorbent garment invention of claim 13 wherein said side margins each comprise a longitudinally extending elastic element.

21. (Currently Amended) The absorbent garment invention of claim 20 wherein each

of said elastic element extends along only a portion of said length of said absorbent composite.

22. (Currently Amended) The absorbent garment invention of claim 13 wherein said first and second end regions of said absorbent composite are connected to said first and second body panels respectively with T-shaped attachment patterns.

Claims 23-28 (Cancelled).

29. (New) The absorbent garment of claim 13 wherein the portions of said first and second body panels overlapped respectively by said first and second end regions of said absorbent composite are not elasticized.

30. (New) The absorbent garment of claim 13 wherein the connection along said center portions is formed as a continuous line of attachment.

REMARKS

In the Written Opinion mailed July 31, 2003, the Examiner made various objections to the specification, including the drawings, and the claims. Applicants have amended the specification, including the drawings, and various claims as set forth above to overcome the noted objections. Applicants respectfully disagree with the Examiner's statement that the Summary of the Invention is not commensurate with the invention of the claims -- the Summary is entirely consistent with the subject matter of the claims and no changes have been made thereto (MPEP 608.01(d)).

The Examiner has also rejected claims 13, 15-16 and 19-22 as being indefinite. Applicants have amended those claims to overcome the Examiner's rejections as set forth above.

The Examiner also rejected claim 13 as being anticipated by either Wantanabe GB '131 or Saisaka et al.'424. Because neither Wantanabe nor Saisaka disclose or suggest all of the recitations of the pending claims, inherently or otherwise, the Examiner's rejections should be withdrawn.

First, Applicants have rewritten claim 13 to clarify that the first and second

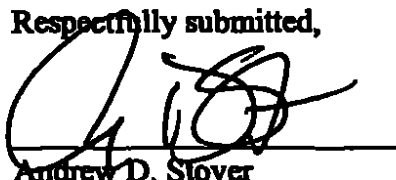
body panels are discreet components with terminal waist edges and longitudinally spaced terminal crotch edges. Neither Wantanabe nor Saisaka disclose or suggest discrete first and second longitudinally spaced body panels. In addition, Saisaka does not disclose or suggest connecting the absorbent composite across an entirety of the width thereof. Rather, as shown for example in FIG. 2 of Saisaka, the absorbent member 3 is adhered to the middle portion 23, but not across the entirety of the width of the absorbent member, for example along the portion overlapping side sheet layers 22. Accordingly, claims 13-22, 29, and 30 are allowable over the cited art and notice to that effect is earnestly solicited.

If any questions or issues remain with respect to this Reply, the authorized officer is respectfully invited to contact the undersigned attorney at (312) 321-4713.

Date:

9/25/03

Respectfully submitted,



Andrew D. Slover

Registration No. 38,629

Attorney For Applicants

BRINKS HOFER
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P.O. Box 10395
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U.S.A.
(312) 321-4200

connected to the body panels. As such, the width of the side margins can be increased without affecting the overall fit of the garment. In addition, the elastic elements can stand up or help seal or gasket the side margins against the user's body. At the same time, the configuration of the outwardly extending side margins ensures that the side margins, especially when they incorporate a moisture barrier, does not fold over the absorbent area defined by the retention portion, especially when the side margin includes elastic elements.

The present invention, together with further objects and advantages, will be best understood by reference to the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Many of the features and dimensions portrayed in the drawings, and in particular the presentation of layer thicknesses and the like, have been somewhat exaggerated for the sake of illustration and clarity.

FIGURE 1 is a plan view of a first embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

FIGURE 2 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 2-2 in Figure 1.

FIGURE 3 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 3-3 in Figure 1.

FIGURE 4 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 4-4 in Figure 1.

FIGURE 5 is a plan view of a second embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

FIGURE 6 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 6-6 in Figure 5.

FIGURE 7 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 7-7 in Figure 5.

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FIGURE 8 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 8-8 in Figure 5.

FIGURE 9 is a plan view of a third embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

5 FIGURE 10 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 10-10 in Figure 9.

FIGURE 11 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 11-11 in Figure 9.

10 FIGURE 12 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 12-12 in Figure 9.

FIGURE 13 is a plan view of a fourth embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

15 FIGURE 14 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 14-14 in Figure 13.

FIGURE 15 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 15-15 in Figure 13.

FIGURE 16 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 16-16 in Figure 13.

20 FIGURE 17 is a plan view of a fifth embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

FIGURE 18 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 18-18 in Figure 17.

25 FIGURE 19 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 19-19 in Figure 17.

FIGURE 20 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 20-20 in Figure 17.

FIGURE 21 is a plan view of a sixth embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

30 FIGURE 22 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 22-22 in Figure 21.

FIGURE 23 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 23-23 in Figure 21.

FIGURE 24 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 24-24 in Figure 21.

5 FIGURE 25 is a plan view of a seventh embodiment of an absorbent garment taken from the bodyside thereof with a portion of the garment partially cut away.

FIGURE 26 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 26-26 in Figure 25.

10 FIGURE 27 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 27-27 in Figure 25.

FIGURE 28 is a schematic illustration of a cross-sectional view of the absorbent garment taken along line 28-28 in Figure 25.

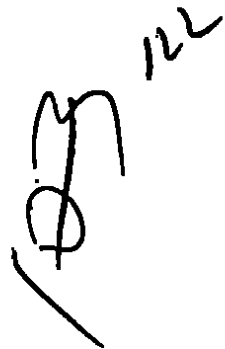
15 FIGURE 29 is a plan view of a seventh embodiment of an absorbent garment taken from the bodyside thereof.

FIGURE 30 is a plan view of an eighth embodiment of an absorbent garment taken from the bodyside thereof.

20 DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

It should be understood that the term "longitudinal," as used herein, means of or relating to length or the lengthwise direction, and in particular, the direction running between the front and back of the user. The term "laterally," as used herein means situated on, directed toward or running from side to side, and in particular, a direction running from the left to the right of a user. The terms "upper," "lower," "inner", and "outer" as used herein are intended to indicate the direction relative to the user wearing an absorbent garment over the crotch region, while the terms "inboard" and "outboard" refer to the directions relative to a centerline of the garment. For example, the terms "inner" and "upper" refer to a "bodyside," which means the side closest to the body of the user, while the terms "outer" and "lower" refer to a "garment side". The term "bodyside" should not be interpreted to mean in contact with

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the body of the user, but rather simply means the side that would face toward the body of the user, regardless of whether the absorbent garment is actually being worn by the user and regardless of whether there are or may be intervening layers between the component and the body of the user. Likewise, the term "garment side" should not be interpreted to mean in contact with the garments of the user, but rather simply means the side that faces away from the body of the user, and therefore toward any outer garments that may be worn by the user, regardless of whether the absorbent garment is actually being worn by a user, regardless of whether any such outer garments are actually worn and regardless of whether there may be intervening layers between the component and any outer garment.

Referring to FIGS. 1, 3, 4, 5, 9, 13, 17, 20 and 21, an absorbent garment 2 includes a first, front body panel 4 and a second, rear body panel 6. The first and second body panels each have an inner, bodyside surface 10 an outer, garment side surface 12 and a length, which is less the overall length of the absorbent garment. Each of the first and second body panels has a first and second longitudinally opposed terminal end edges 16, 14, 20, 18, and outer side edges, including a tapered edge 22, 26 and an outboard edge 24, 28 formed along the outer periphery of laterally opposed ear portions 30, 32.

Alternatively, as shown in FIGS. 29 and 30, the front body panel 4 does not include a tapered side edge, but rather the terminal end edge 16 extends along the entire width of the body panel between the opposite outboard edges 24. It should be understood that the rear body panel can be configured in a similar fashion. Referring to FIGS. 1, 5, 9, 13, 17, 20, 21, 29 and 30, the first terminal edges 14, 16 of the first and second body panels are longitudinally spaced to form an opening 34 therebetween in the crotch region of the garment, while the second terminal edges 20, 18 of the first and second body panels form front and back waist edges respectively. A plurality, meaning two or more, of laterally extending elastic elements 36 can be secured to each of the first and second body panels. Likewise, one or more leg elastic elements 38 can be

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secured along the tapered side edge of the body panels to form a gasket with the leg of the user.

For example, as shown in FIGS. 1-4, each panel can be made of an elasticized composite panel material comprising two non-woven substrates 40 with the plurality of elastic strands 38, 36 sandwiched therebetween. The elastic strands are positioned in the waist regions and along the leg perimeters. A portion of the leg elastic elements 38 can extend under a side margin of an absorbent composite 50. The placement of the panel leg elastic elements further inward along the side edge provides for improved fit and performance of the garment.

In an alternative embodiment, shown in FIG. 21, an absorbent composite 50 extends longitudinally along the entire extent of the garment from one end 116 to the other end 118 thereof. A pair of front, side body panels 108 have inboard edges 180 that are secured to opposite side regions of the absorbent composite, preferably on the bodyside thereof, adjacent one end thereof and inboard from a peripheral side edge 52 of the absorbent composite. Likewise, a pair of rear, side body panels 110 have inboard edges 184 that are secured to opposite side regions 186 of the absorbent composite, preferably on the bodyside thereof, adjacent the opposite end thereof and inboard from the peripheral side edge 152. The body panels 108, 110 extend laterally outward from the absorbent composite and form ear portions 112, 114 having outboard edges 188, 190. It should be understood that the absorbent composite could alternatively be secured to the garment side of the body panels.

Referring to FIGS. 1, 5, 9, 13, 17 and 21, fastening tabs 42 are attached and extend laterally from the outboard edge 28, 190 of the rear body panels from an attachment location 45. It should be understood that the fastening tabs could be affixed to the front body panels or to both the front and rear body panels. For the purposes of illustration, the right side tab 42 is shown as being folded in during manufacture, while the left side tab 42 is shown as being extended outboard during use. The fastening tabs can be made of a hook and loop combination, such as a Velcro® fastening system, or can have adhesive or

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other bonding agents applied to one surface thereof. Various hook configurations are described in U.S. Patent No. 5,845,375 to Miller et al., U.S. Patent No. 6,132,660 to Kampfer, U.S. Patent No. 6,000,106 to Kampfer, U.S. Patent No. 5,868,987 to Kampfer, U.S. Patent No. 4,894,060 to Nestegard, and U.S. Patent No. 6,190,594 B1 to Gorman, the entire disclosures of which are incorporated by reference herein. Some examples of suitable hook fasteners are the various CS600 hook fasteners manufactured by Minnesota Mining and Manufacturing Co., St. Paul Minn.

As shown in FIG. 1, the tab 42 can include one or more attachment pads 43. Alternatively, the fastening tabs can include buttons, snaps, ties or other known fastening devices. The tabs can be secured to the body panel with adhesive bonds, sonic bonds, thermal bonds, pinning, stitching or other known types of attachment.

When the absorbent garment is secured to the user, the fastening tabs 42 secured to the body panels 6, 110 on one end of the absorbent composite engage or are otherwise connected to the body panels 4, 108 on the opposite end of the garment. Alternatively, a landing member, which is particularly suited for engaging the fastening tabs and in particular the attachment pads, can be disposed on the body panel. For example, a pattern-unbonded material, as disclosed for example in U.S. Patent No. 5,858,515 to Stokes, which is hereby incorporated by reference, is particularly well-suited for engaging a hook material. Other landing materials can be incorporated that are suitable for engaging adhesives and the like. When secured in this way, openings 120 are formed on each side of the absorbent composite with the peripheral edge 52, 152 of the absorbent composite further defining the opening along the crotch region of the garment. When secured, the front and rear body panels 108, 110 form opposite side body panels.

It should be understood that the outboard edges 24, 28, 188, 190 of the front and rear body panels could be connected, for example by bonding or sewing, to create a seam of a pant garment. For example, the embodiments of FIGS. 29 and 30 are shown without fastening tabs, wherein the outboard edges

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24 and 28 are secured to form a seam. However, it should be understood that fastening tabs could be incorporated into those embodiments. Alternatively, the front and rear body panels can be formed integrally, for example as a single side panel attached to opposite ends 116, 118 of the absorbent composite, or as one panel extending around the waist and hips of the user. In yet another alternative embodiment, the outboard edges can be connected to create a seam in combination with fastening tabs, which can be used for example and without limitation to secure the body panels across a line of weakness, such as a perforation. The line of weakness can be formed for example along a breakable seam between the front and rear body panels, or along a length of one or both of the front and rear body panels.

In particular aspects of the invention, either or all of the body panels may be composed of a wide range of materials with various basis weights and properties. For example, the body panel material may include knitted or other woven fabrics, nonwoven fabrics, polymer films, laminates, and the like, as well as combinations thereof. Preferably, the body panels are made of an elastic material, wherein the term "elastic" means capable of recovering the size and shape thereof after deformation, and/or exhibiting a retractive force.

In the various configurations of the invention, the basis weight of the body panel material can be at least a minimum of about 10 g/m². Alternatively, the basis weight can be at least about 20 g/m², and optionally, can be at least about 40 g/m² to provide improved benefits. In further aspects, the basis weight of the body panel material can be not more than a maximum of about 100 g/m². Alternatively, the basis weight can be not more than about 80 g/m², and optionally, can be not more than about 60 g/m² to provide improved performance.

In the differing configurations of the invention, the body panel material may be substantially permeable to air or substantially impermeable to air. The body panel material also may be substantially liquid-permeable or substantially liquid-impermeable. In particular arrangements, the body panel material may be substantially nonelastomeric. In other aspects, the body panels can include

an elastomeric material which is elastomerically stretchable at least along the lateral article width. Examples of such elastomeric materials can include a neck-bonded-laminate (NBL), a stretch-bonded-laminate (SBL), a necked-thermal laminate, or the like, as well as combinations thereof. Such laminates

5 can provide an improved combination of cloth-like feel and elastomeric stretchability. The body panels can be composed of materials that are elastic or elastomeric and exhibit biaxial stretch characteristics or MD/CD stretch characteristics, or that are extensible composites.

In desired configurations, the elastomeric body panel material can
10 provide an elastomeric, stretch elongation which is at least about 20%, and desirably is at least about 50%. Alternatively, the stretch elongation can be at least about 75%, and optionally, can be at least about 100% to provide improved performance. In other aspects, the elastomeric stretch elongation can be not more than about 400% and desirably can be not more than about 200%.
15 Alternatively, the stretch elongation can be not more than about 300%, and optionally can be not more than about 250% to provide improved performance.

The percentage of elastomeric stretch or other elongation can be determined in accordance with the following formula: $100 * (L - L_0)/L_0$;

where: L = stretched length,

20 L₀ = initial length,

In addition, the amount of stretch elongation is determined under an applied tension force of 250 gram-force per inch of width measured perpendicular to the direction of the applied tension. Various configurations and materials of the body panels are further shown and described in U.S. Patent
25 No. 6,132,410 directed to a " Disposable Garment Having Dryness Barriers With Expandable Attachment To An Absorbent," the entire disclosure of which is hereby incorporated herein by reference.

The body panels also can be made of extensible materials, or combinations of elastomeric and extensible materials. It should be readily
30 appreciated that each of the individual body panels may be composed of different materials, or of substantially the same material.

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The term extensible means capable of being extended, and that it provides a selected elongation when subjected to an applied tensile force. The body panel also is preferably capable of providing a selected, sustained deformation when subjected to an applied tensile force and then allowed to relax for a selected time period beginning immediately after removal of the tensile force. Preferably the sustained deformation is substantially permanent deformation. The selected elongation and sustained deformation preferably occur at least along the lateral cross-direction of the garment, although it should be understood that it also could occur along the longitudinal direction, or both.

Various extensible materials, and other acceptable materials that can be used for the body panels and the absorbent composite, which may include without limitations a retention portion, a topsheet and a backsheet, are described in U.S. Application S/N 09/249,434 filed February 12, 1999, entitled Expandable Cover Garment, the entire disclosure of which is hereby incorporated herein by reference.

Referring again to FIGS. 1-4, the absorbent composite 50 has first and second longitudinally opposed end regions 56, 58 and first and second longitudinally opposed terminal end edges 60, 62. The absorbent composite includes a substantially liquid permeable topsheet 64, or liner, and a substantially liquid impermeable backsheet 68, or barrier layer. A retention portion 70 is disposed or sandwiched between the topsheet and the backsheet, which are connected, at least along their peripheral edges. The absorbent composite, and in particular the retention portion, can be made in many different shapes, including rectangular and hour-glass shapes.

The topsheet and backsheet can be minimally attached, e.g. at the peripheral edges, or they can be attached across substantially the entire surface area thereof. The topsheet and backsheet can be joined for example with adhesive bonds, sonic bonds, thermal bonds, pinning, stitching or any other attachment techniques known in the art, as well as combinations thereof. For example, a uniform continuous layer of adhesive, a patterned layer of adhesive, a sprayed pattern of adhesive or any array of lines, swirls or spots of

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construction bonds may be used to join the topsheet and backsheet, or any of the other components described herein. Additional layers, including for example, a surge layer 72, can also be incorporated into the absorbent composite. Preferably, the surge layer does not run the entire length of the absorbent composite and is shorter than the retention portion. In alternative configurations, the topsheet is indirectly joined to the backsheet by affixing the topsheet to intermediate layers, such as the surge layer or retention portion, which in turn is affixed to the backsheet.

The topsheet 64 presents a body-facing surface that is compliant, soft-feeling, and non-irritating to the wearer's skin. Further, the topsheet 64 can be less hydrophilic than retention portion 20, and is sufficiently porous to be liquid permeable, permitting liquid to readily penetrate through its thickness to reach the retention portion. A suitable topsheet layer 64 may be manufactured from a wide selection of web materials, such as porous foams, reticulated foams, apertured plastic films, natural fibers (for example, wood or cotton fibers), synthetic fibers (for example, polyester or polypropylene fibers), or a combination of natural and synthetic fibers. The topsheet layer 64 is typically employed to help isolate the wearer's skin from liquids held in the retention portion.

Various woven and nonwoven fabrics can be used for topsheet 64. For example, the topsheet may be composed of a meltblown or spunbonded web of the desired fibers, and may also be a bonded-carded-web. The various fabrics can be composed of natural fibers, synthetic fibers or combinations thereof.

For the purposes of the present description, the term "nonwoven web" means a web of fibrous material which is formed without the aid of a textile weaving or knitting process. The term "fabrics" is used to refer to all of the woven, knitted and nonwoven fibrous webs.

The topsheet fabrics may be composed of a substantially hydrophobic material, and the hydrophobic material may optionally be treated with a surfactant or otherwise process to impart a desired level of wettability and hydrophilicity. In a particular embodiment of the invention, topsheet 64 is a

nonwoven, spunbond polypropylene fabric composed of about 2.8 - 3.2 denier fibers formed into a web having a basis weight of about 22 gsm and density of about 0.06 gm/cc. The fabric can be surface treated with an operative amount of surfactant, such as about 0.28% Triton® X-102 surfactant. The surfactant
5 can be applied by any conventional means, such as spraying, printing, brush coating or the like.

In various embodiments, as described below, the topsheet can be made of extensible materials, as described with respect to the body panels and backsheet. For example, the topsheet can be prenecked for extensibility.

10 The backsheet 68 is preferably liquid impermeable, but may be liquid permeable, e.g., when a barrier layer is used with the retention portion. For example, in one embodiment, the backsheet can be made from a thin plastic film, or other flexible, substantially liquid-impermeable material. As used herein, the term "flexible" means a material that is compliant and which will
15 readily conform to the general shape and contour of the body of the user. The backsheet prevents various bodily fluids and exudates from wetting or otherwise contaminating various bedding or outer garments worn by the user over the absorbent garment. In particular, the backsheet can include a film, such as a polyethylene film, having a thickness of from about 0.012 mm to about 0.051
20 mm.

In other alternative constructions, the backsheet can comprise a woven or nonwoven fibrous web layer, which is treated or constructed, partially or wholly, to impart the desired levels of liquid impermeability to selected regions that are adjacent to or proximate the absorbent retention portion. For example,
25 the backsheet may include a gas-permeable, nonwoven fabric layer laminated to a polymer film layer which may or may not be gas-permeable. Other examples of fibrous, cloth-like backsheet materials can comprise a stretch thinned or stretch thermal laminate material composed of a 0.6 mil (0.015 mm) thick polypropylene cast film and a 0.7 ounce per square yard (23.8 gsm)
30 polypropylene spunbond material (2 denier fibers). A material of this type has been employed to form the outercover of a Huggies® Ultratrim Disposable

Diaper, which has been commercially available from Kimberly-Clark Corporation. The backsheet 68 typically provides the outercover of the article. Optionally, however, the article may include a separate outercover component member which is additional to the backsheet. The outercover can be joined, for example, to one or more of the absorbent composite and/or body panels.

The backsheet may include a micro-porous, "breathable" material which permits gases, such as water vapor, to escape from the absorbent garment while substantially preventing liquid exudates from passing through the backsheet. For example, the breathable backsheet may be composed of a microporous polymer film or a nonwoven fabric which has been coated or otherwise modified to impart a desired level of liquid impermeability. For example, a suitable microporous film can be a PMP-1 material, which is available from Mitsui Toatsu Chemicals, Inc., a company having offices in Tokyo, Japan; or an XKO-8044 polyolefin film available from 3M Company of Minneapolis, Minnesota. The backsheet may also be embossed or otherwise provided with a pattern or matte finish to exhibit a more aesthetically pleasing appearance.

In various configurations of the invention, where a component, such as the backsheet is configured to be permeable to gas while having a resistance and limited permeability to aqueous liquid, the liquid resistant component can have a construction which is capable of supporting a selected hydrohead of water substantially without leakage therethrough. A suitable technique for determining the resistance of a material to liquid penetration is Federal Test Method Standard FTMS 191 Method 5514, 1978, or an equivalent thereof.

In one preferred embodiment, the backsheet is sufficiently impermeable to liquid and semi-liquid materials to substantially prevent the undesired leakage of waste materials, defined as exudates, including for example urine and feces. For example, the backsheet member can desirably support a hydrohead of at least about 45 centimeters (cm) substantially without leakage. The backsheet member can alternatively support a hydrohead of at least about 55 cm, and

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optionally, can support a hydrohead of at least about 60 cm, or more, to provide improved benefits.

The backsheet is preferably extensible, as that term is defined above with respect to the body panels. In one preferred embodiment, the backsheet is capable of providing an elongation of at least about 1 cm when subjected to a tensile force of 11.8 g/cm, and further provides a substantially permanent deformation of at least about 20% when subjected to a tensile force of 19.70 g/cm and is then allowed to relax under a zero applied stress for a period of 1 minute.

For example, the extensible backsheet can be composed of a necked fiber, a creped fiber, a micro-pleated fiber, polymer films or the like, as well as combinations thereof. The fabrics may be woven or nonwoven materials, such as spunbond fabrics. One example of a suitable extensible material is a 60% necked, polypropylene spunbond having a basis weight of about 1.2 osy.

The backsheet also can be expandable, for example when it has one or more folds, e.g., one or more z-folds (not shown), or can be both extensible and expandable. The term expandable as used herein means to enlarge or to increase the extent or area, lateral and/or longitudinal, thereof, e.g., by unfolding one or more folds.

The retention portion 70 is preferably made of an absorbent material, which tends to swell or expand as it absorbs liquid excreted or exuded by the user. For example, the absorbent material can be made of airformed, airlaid and/or wetlaid composites of fibers and high absorbency materials, referred to as superabsorbents. Superabsorbents typically are made of polyacrylic acids, such as FAVOR 880 available from Stockhausen, Inc. of Greensboro, North Carolina. The fibers can be fluff pulp materials, such as Alliance CR-1654, or any combination of crosslinked pulps, hardwood, softwood, and synthetic fibers. Airlaid and wetlaid structures typically include binding agents, which are used to stabilize the structure. In addition, various foams, absorbent films, and superabsorbent fabrics can be used as an absorbent material.

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In one preferred embodiment, an absorbent material is made of fibrous absorbent materials with a relatively high internal integrity, including for example one made with thermoplastic binder fibers in airlaid absorbents, e.g., pulp, bicomponent binding fibers, and superabsorbents, which have higher densities in the folded regions. The higher density and resulting smaller capillary size in these regions promotes better wicking of the liquid. Better wicking, in turn, promotes higher utilization of the absorbent material and tends to result in more uniform swelling throughout the absorbent material as it absorbs the liquid.

10 Various types of wettable, hydrophilic fibrous material can be used to form the component parts of absorbent, and particularly the retention portion 70. Examples of suitable fibers include naturally occurring organic fibers composed of intrinsically wettable material, such as cellulosic fibers; synthetic fibers composed of cellulose or cellulose derivatives, such as rayon fibers; 15 inorganic fibers composed of an inherently wettable material, such as glass fibers; synthetic fibers made from inherently wettable thermoplastic polymers, such as particular polyester or polyamide fibers; and synthetic fibers composed of a nonwettable thermoplastic polymer, such as polypropylene fibers, which have been hydrophilized by appropriate means. The fibers may be 20 hydrophilized, for example, by treatment with silica, treatment with a material which has a suitable hydrophilic moiety and is not readily removable from the fiber, or by sheathing the nonwettable, hydrophobic fiber with a hydrophilic polymer during or after the formation of the fiber. For the purposes of the present invention, it is contemplated that selected blends of the various types of 25 fibers mentioned above may also be employed.

As used herein, the term "hydrophilic" describes fibers or the surfaces of fibers which are wetted by the aqueous liquids in contact with the fibers. The degree of wetting of the materials can, in turn, be described in terms of the contact angles and the surface tensions of the liquids and materials involved. 30 Equipment and techniques suitable for measuring the wettability of particular fiber materials or blends of fiber materials can be provided by a Cahn SFA-222

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Surface Force Analyzer System, or a substantially equivalent system. When measured with such system, fibers having contact angles less than 90° are designated "w ettable", while fibers having contact angles greater than 90° are designated "no nwettable".

5 In particular arrangements, the retention portion of the absorbent may comprise a mixture of superabsorbent hydrogel-forming particles and synthetic polymer meltblown fibers, or a mixture of superabsorbent particles with a fibrous coform material comprising a blend of natural fibers and/or synthetic polymer fibers. The superabsorbent particles may be substantially
10 homogeneously mixed with the hydrophilic fibers, or may be nonuniformly mixed. For example, the concentrations of superabsorbent particles may be arranged in a non-step-wise gradient through a substantial portion of the thickness (z-direction) of the absorbent structure, with lower concentrations toward the bodyside of the absorbent composite and relatively higher
15 concentrations toward the outside of the absorbent structure. Suitable z-gradient configurations are described in U.S.P. 4,699,823 issued October 13, 1987 to Kellenberger et al., the entire disclosure of which is incorporated herein by reference in a manner that is consistent (not in conflict) with the present description. Alternatively, the concentrations of superabsorbent
20 particles may be arranged in a non-step-wise gradient, through a substantial portion of the thickness (z-direction) of the absorbent structure, with higher concentrations toward the bodyside of the absorbent composite and relatively lower concentrations toward the outside of the absorbent structure. The superabsorbent particles may also be arranged in a generally discrete layer
25 within the matrix of hydrophilic fibers. In addition, two or more different types of superabsorbent may be selectively positioned at different locations within or along the fiber matrix.

The high-absorbency material may comprise absorbent gelling materials, such as superabsorbents. Absorbent gelling materials can be natural, synthetic
30 and modified natural polymers and materials. In addition, the absorbent gelling materials can be inorganic materials, such as silica gels, or organic compounds

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such as cross-linked polymers. The term "cross-linked" refers to any means for effectively rendering normally water-soluble materials substantially water insoluble but swellable. Such means can include, for example, physical entanglement, crystalline domains, covalent bonds, ionic complexes and associations, hydrophilic associations, such as hydrogen bonding, and hydrophobic associations or Van der Waals forces.

Examples of synthetic absorbent gelling material polymers include the alkali metal and ammonium salts of poly(acrylic acid) and poly (methacrylic acid), poly(acrylamides), poly(vinyl ethers), maleic anhydride copolymers with vinyl ethers and alpha-olefins, poly(vinyl pyrrolidone), poly(vinylmorpholinone), poly(vinyl alcohol), and mixtures and copolymers thereof. Further polymers suitable for use in the absorbent composite include natural and modified natural polymers, such as hydrolyzed acrylonitrile-grafted starch, acrylic acid grafted starch, methyl cellulose, chitosan, carboxymethyl cellulose, hydroxypropyl cellulose, and the natural gums, such as alginates, xanthan gum, locust bean gum and the like. Mixtures of natural and wholly or partially synthetic absorbent polymers can also be useful in the present invention. Other suitable absorbent gelling materials are disclosed by Assarsson et al. in U.S. Patent No. 3,901,236 issued August 26, 1975, which is hereby incorporated herein by reference. Processes for preparing synthetic absorbent gelling polymers are disclosed in U.S. Patent No. 4,076,663 issued February 28, 1978 to Masuda et al. and U.S. Patent No. 4,286,082 issued August 25, 1981 to Tsubakimoto et al., both of which are hereby incorporated herein by reference.

Synthetic absorbent gelling materials typically are xerogels which form hydrogels when wetted. The term "hydrogel", however, has commonly been used to also refer to both the wetted and unwetted forms of the material.

As mentioned previously, the high-absorbency material used in the absorbent is generally in the form of discrete particles. The particles can be of any desired shape, for example, spiral or semi-spiral, cubic, rod-like, polyhedral, etc. Shapes having a large greatest dimension/smallest dimension

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ration, like needles, flakes and fibers, are also contemplated for use herein. Conglomerates of particles of absorbent gelling material may also be used in the absorbent. Desired for use are particles having an average size of from about 20 microns to about 1 millimeter. "Particle size" as used herein means the

5 hydrophilic fibers and high-absorbency particles can be configured to form an average composite basis weight which is within the range of about 50 -1500 gsm. In certain aspects of the invention, the average composite basis weight is within the range of about 200 - 1200 gsm, and alternatively is within the range of about 200 -1200 gsm, and alternatively is within the range of about 500 -800

10 gsm to provide desired performance. Furthermore, the proportion of high absorbency particles can range from about 0 to about 100% and the proportion of fibrous material from about 0 to about 100%. Additionally, high absorbency fibers can be used such as Oasis Type 121 and Type 122 superabsorbent fibers available from Technical Absorbent Ltd., Grimsby, Lincolnshire, United

15 Kingdom.

The retention portion 70 has laterally opposed side edges 74 and preferably is made of a single layer of material. As shown in FIG. 29, the absorbent composite 50 and retention portion 70 have a generally rectangular shape. Alternatively, as shown in FIGS. 1 and 30, the retention portion 70 has

20 an hour-glass shape, with a narrower middle portion and enlarged end portions. The absorbent composite, and in particular the top sheet and backsheet also can be configured in an hour-glass shape with enlarged end regions. In other alternative embodiments, the retention portion can include a folded or multi-layered configuration. The retention portion preferably has a length

25 substantially equal to, or slightly shorter than, the length of the absorbent composite. The retention portion can include one or more barrier layers attached to the absorbent material. In one embodiment, an upper and lower tissue substrate 88, 90 also can be disposed adjacent the retention portion, or alternatively the tissue can completely envelope the retention position.

30 Referring to FIG. 1, the opposite garment side of the end regions 56, 58 of the absorbent composite, and in particular, the outer, garment side surface of

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the backsheet 68, are secured to the bodyside surface of the longitudinally opposed crotch ends of the first and second body panels 4, 6. Preferably, the garment side surface of the end regions 56, 58 overlap and are connected to the bodyside surface of the body panels along three longitudinally extending, parallel, spaced locations 76, 78. It should be understood that the absorbent composite can be secured using any of the methods of attachment described above, including for example and without limitation, adhesive bonds, sonic bonds, thermal bonds, pinning, stitching or other attachment techniques known in the art, as well as combinations thereof. Moreover, it should be understood that the three locations are meant to be illustrative, and that the lateral width (W) of the absorbent composite defined between the opposite outboard edges of attachment can be secured to the body panels with any configuration of attachment lines, swirls, patterns, spots, etc., or can be a full and continuous attachment therebetween. The outboard attachment locations 76, or the outboard edge of the area of attachment, are preferably spaced inboard from the side edge 52 of the absorbent composite, preferably slightly outboard of the side edges 74 of the retention portion. The retention portion 70 preferably has a lesser lateral width than the overall absorbent composite.

In particular, in the embodiment shown in FIGS. 1-4, the backsheet and topsheet have laterally extending side margins 82, 80 that extend laterally outboard from the side edge 74 of the retention portion and from the location 76 of attachment to the body panels. It should be understood that the term "location" means any region, dot, position or side, and is not limited to the longitudinally extending lines shown in the Figures. For example, the location could comprise a series of longitudinally extending dots or points. Conversely, the location could comprise a continuous region or area attachment extending across the lateral width (W) of the absorbent composite between the outboard edges of the attached region of the absorbent composite. The term "a ttached region" means the region extending between the opposite outboard edge of the attachment locations, and is shown, for example, as having a width W in FIG. 3. The side margins 80, 82 are preferably formed along the entire longitudinal

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extent of the portion of the absorbent composite that overlaps the body panels, and also extend along the crotch and the absorbent composite between the body panels. The side margins 80, 82 are not attached to the body panels 4, 6 and terminate in free edges 84, 86.

5 It should be understood that the side margins may extend along only a portion of the overlapping absorbent composite. For example, and referring to FIGS. 29 and 30, the absorbent composite 50 is connected to each of the body panels 4, 6 with a T-shaped attachment pattern 176, 178, or location. In particular, the garment side surface of the end regions 56, 58 of the absorbent composite overlap and are connected to the body side surface of the body panels 4, 6 along a longitudinally extending location 180, 184 at a center portion of the absorbent composite and of the body panels, and also along laterally extending locations 182, 186 at each end of the absorbent composite, thereby forming the stepped, T-shaped pattern. Preferably, the laterally extending attachment locations 182, 186 at the four corners at the ends of the absorbent composite, in combination with the portion of the longitudinally extending location at the end of the absorbent composite, forms a laterally extending attachment location that extends along substantially the entirety of the width of the absorbent composite at the end thereof. In an alternative embodiment, the absorbent composite 50 is secured to the body panels only at the four corner locations 182, 186, with the space therebetween remaining unattached to the body panels. The length of the laterally extending attachment locations can vary from almost nothing, wherein just the end or edge of the absorbent composite is secured to the body panel at those locations 182, 186, to almost the entirety of the length of the absorbent composite that overlaps the body panel. Indeed, in one alternative embodiment, the entirety of the absorbent composite that overlaps the body panel can be secured thereto.

 A side margin 188, 190 extends laterally outward from each side of the longitudinal location 180, 184 at the center portion and terminates in a free edge 192, 194. In addition, the side margins 188, 190, and the free edges 192, 194, extend longitudinally inward along the length of the absorbent composite from

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the lateral attachment locations 182, 186 at the ends of the absorbent composite. In this way, the four corners 182, 186 of the absorbent composite are secured to the body panels, yet the absorbent composite is provided with opposite side margins extending along the length of the portion of the absorbent composite overlapping the body panels inward from those locations on each side of the absorbent composite. In this way, the side margins are prevented from being folded over the absorbent area of the absorbent composite so as to impede the absorption of exudates. It should be understood that the side margins 188, 190 shown in FIGS. 29 and 30 can be formed from any of the topsheet, backsheet, or combination thereof, or any other component of the absorbent composite, with or without folds, as variously disclosed herein.

In a preferred embodiment, the width of the portion of the side margin overlapping the body panels between the longitudinal location and the free edge remains relatively constant. It should be understood that in other embodiments, the width can vary, as shown for example in FIG. 17 as explained below, or as that width is defined between other non-parallel and/or curvilinear configurations of the attachment locations and free edges.

It should be understood that in an alternative embodiment, the retention portion, or one or more other layers including for example the surge layer or tissue layers, also can have opposite side margins that extend outboard from the locations 76 of attachment to the body panels and are sandwiched between the side margins 80, 82.

The side margins preferably have a lateral width greater than about 3 mm and less than about 75 mm. More preferably, the side margins each have a width of between about 15 mm and about 45 mm, and more preferably a width of between about 25 mm and about 35mm. Preferably, the side margins have a combined lateral width that is at least 3% and not more than about 75% of the total lateral width of the absorbent composite, and more preferably between about 15% and 50% of the total lateral width, and even more preferably between about 25% and 35%. The body panels extend beyond the lateral and longitudinal edges of the side margins of the absorbent composite.

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In the embodiments shown in FIGS. 5-8, 29 and 30, one or more elastic elements 92, shown as three, are secured in the side margins 80, 82 between the topsheet and backsheet, and extend longitudinally along a portion of the side margins on each side of the absorbent composite. Preferably, the elastic elements extend along the side margins of the absorbent composite between the body panels and overlap a portion of each body panel 4, 6. The length of the elastic elements is preferably between about 5% and 100% of the length of the absorbent composite. For example, as shown in FIG. 29, the elastic elements 92 extend along the side margins from the lateral attachment location 182 at the end of the absorbent composite secured to the front body panel 4 across the terminal edge 14 of the rear body panel. The function of the elastic elements 92 in the side margins of the absorbent composite are to shorten the length of the side margin which pulls the side margins inwardly to form a three-dimensional profile so as to seal or gasket against the body of the user. At the same time, in the embodiments of FIGS. 17, 29 and 30, the attachment of the absorbent composite 50 at the four corners thereof prevents the side margins from being folded or drawn over the absorbent area. In addition, assembly of the garment is facilitated since the absorbent composite lies flat when the elastic elements are stretched in the machine direction. The elastic elements can be positioned at various laterally spaced positions, depending on the amount of shortening and upward lift desired. The elastic elements can be made of ribbon, films, sprays of elastic, or other elastic configurations known in the art. It should be understood that elastic elements can be incorporated into any of the other side margin configurations described herein.

In a third embodiment shown in FIGS. 9-12, the topsheet side margin 80 includes a first portion 94 folded over a second portion 96, with a side margin portion 82 of the backsheet disposed between the first and second portions 94, 96 of the topsheet. The folded first and second portions 94, 96 form a folded edge 98 that defines the free edge of the side margin of the absorbent composite. The function of the folded topsheet is to provide a clothlike feel to the portion 82 of the backsheet that forms the side margin. Preferably, the

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topsheel covers at least the free edge 86 of the backsheet, which provides comfort to the user with minimal cost.

In yet another embodiment shown in FIGS. 25-28, the body panel 300 is continuous from the rear of the garment through the crotch region to the front of the garment. In such an embodiment, the absorbent composite can be attached to the front 302, rear 304 and crotch 306 portions of the body panel. In essence, a crotch body panel extends between and connects a front and rear body panel. The body panel 300 is preferably made of continuous sheets or layers that form the three regions, although it should be understood that separate pieces can be joined, e.g., by bonding, stitching etc., to form the full length body panel.

In one embodiment, the two locations 172 of attachment would extend the length of the absorbent composite. In one embodiment, shown in FIG. 26, the body panel width in the crotch region 306, defined by outboard edges 310, extends between the outboard attachment locations; or is preferably substantially the same width as the width "W" of the attached region, and more preferably is substantially the same width as the retention portion. In an alternative embodiment, the body panel extends outboard from the attachment locations, but remains unattached to the side margins of the absorbent composite. Preferably, the absorbent composite extends substantially the entire length of the garment, although it should be understood that it could have a length less than the entire length of the garment, as shown for example in FIG. 1.

In another embodiment, shown in FIGS. 13-16, the side margin is formed only by the topsheet, with the backsheet having side edges terminating proximate the attachment locations. Preferably, the topsheet has a folded first and second portion 94, 96 forming a folded edge 98 that defines the free edge of the side margin. Conversely, it should be understood that the side margin can be formed only by the backsheet, which can be monolayer, or which can have various folds, including for example a folded first and second portion. It should be understood that the first portion can be folded under the second

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portion, as shown in the Figures, or folded over the second portion. It also should be understood that the side margin could have additional folds, formed for example by a third portion interfolded with the first and second portions. Preferably, each side margin or the side margins in combination have a width or
5 range of widths as described above.

In another embodiment, shown in FIGS. 17-20, the side margin 80 is tapered from a first width D1 adjacent a first position 102 at the terminal edge of the body panel to a second width D2 adjacent a second position 104 at the end of the end edge of the absorbent composite. In one embodiment, the
10 second width is zero. Preferably, D1 ranges from not less than about 5% to not greater than about 50% of the total lateral width of the absorbent composite. Preferably, D2 ranges from about 0 to not greater than about 50% of the total lateral width of the absorbent composite. The gradient attachment location 106 allows the marginal side edges of the absorbent composite to fold inwardly in
15 the crotch region during use to gasket with the user, while the attachment at the end regions provides and maintains the area of coverage of the absorbent composite in the front and back panels without affecting the fit of the garment. In particular, as with the embodiments of FIGS. 29 and 30, the four corners of the absorbent composite 50 are secured to the body panels to prevent the side
20 margins 80 from folding over the absorbent area, yet the absorbent composite is provided with opposite side margins extending along the length thereof between those locations on each side of the absorbent composite.

In another embodiment, shown in FIGS. 21-24, the absorbent composite 50 extends substantially the entire length of and defines the length of the
25 absorbent composite and preferably the absorbent garment. Each of the bodyside surfaces of the inboard terminal edges 180, 184 of the front and back side panels 108, 110 are secured to the absorbent composite along a location 172 spaced laterally inboard from the side edge 52 of the absorbent composite so as to form opposite side margins 80, 82. As such, the side margins extend
30 the entire longitudinal length of the body panels and the garment. It should be understood that although the side margins 80, 82 are shown as being formed

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from the backsheet and topsheet, without a folded edge, any of the above-described side margin configurations could be used, including a folded topsheet configuration. Indeed, it should be understood that any of the aforementioned configurations of the side margins, whether formed from one or both of the
5 backsheet and topsheet, with or without folded portions and with or without elastic elements, can be incorporated into an absorbent composite attached to any of the aforementioned body panel configurations, or their equivalents, including without limitation, a continuous one-piece body panel (whether made from one or more layers or plies), a two-piece body panel, or a four piece body
10 panel.

Although the present invention has been described with reference to preferred embodiments, those skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention. As such, it is intended that the foregoing detailed description be
15 regarded as illustrative rather than limiting and that it is the appended claims, including all equivalents thereof, which are intended to define the scope of the invention.

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WHAT IS CLAIMED IS:

1. (Cancelled).
2. (Cancelled).
- 5 3. (Cancelled).
4. (Cancelled).
- 10 5. (Cancelled).
6. (Cancelled).
7. (Cancelled).
- 15 8. (Cancelled).
9. (Cancelled).
- 20 10. (Cancelled).
11. (Cancelled).
12. (Cancelled).
- 25 13. An absorbent garment comprising:
longitudinally spaced first and second body panels each having a body side
surface, a terminal waist edge and a terminal crotch edge, wherein said crotch
edges of said first and second body panels are longitudinally spaced apart and
30 define a gap therebetween and wherein said waist edges of said first and second
body panels are longitudinally spaced apart; and

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an absorbent composite having a longitudinally extending length, a laterally extending width and longitudinally opposed first and second end regions having respective first and second ends, said absorbent composite comprising a backsheet, a topsheet and a retention portion disposed between said backsheet and said topsheet, wherein said absorbent composite bridges said gap between said crotch edges of said first and second body panels and wherein said first end region of said absorbent composite overlaps and is connected to said bodyside surface of said first body panel along a longitudinally extending center portion thereof and across an entirety of said width of said absorbent composite at said first end thereof, and wherein said second end region of said absorbent composite overlaps and is connected to said bodyside surface of said second body panel along a longitudinally extending center portion thereof and across an entirety of said width of said absorbent composite at said second end thereof, wherein said absorbent composite comprises a pair of laterally opposed side margins terminating in opposite, longitudinally extending outboard free edges, respectively, wherein said side margins are not attached to said first and second body panels and wherein said longitudinally extending free edges extend between the connections across said width of said absorbent composite at said first and second ends thereof and said crotch edges of said first and second body panels respectively, and wherein said side margins each have a relatively constant width between said center portion and said free edges.

14. The absorbent garment of claim 13 wherein said first body panel comprises a first pair of side body panels and wherein said second body panel comprises a second pair of side body panels, wherein each of said side body panels comprises an outboard terminal edge and an inboard terminal edge, wherein said inboard terminal edge is connected to said absorbent composite along said center portion thereof.

15. The absorbent garment of claim 13 wherein said side margins are formed from said backsheet.

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16. The absorbent garment of claim 13 wherein said side margins are formed from said topsheet.
- 5 17. The absorbent garment of claim 16 wherein side margins each comprise a first portion of said topsheet folded over a second portion of said topsheet, wherein said folded first and second portions form a folded edge defining said free edge of said side margin.
- 10 18. ~~18~~ The absorbent garment of claim 17 wherein said side margins further comprise a portion of said backsheet disposed between said first and second portions of said topsheet.
- 15 19. The absorbent garment of claim 13 wherein said side margins are formed from said topsheet and said backsheet.
20. The absorbent garment of claim 13 wherein said side margins each comprise a longitudinally extending elastic element.
- 20 21. The absorbent garment of claim 20 wherein each of said elastic element extends along only a portion of said length of said absorbent composite.
22. The absorbent garment of claim 13 wherein said first and second end regions of said absorbent composite are connected to said first and second body panels respectively with T-shaped attachment patterns.
- 25
23. (Cancelled).
24. (Cancelled).
- 30
25. (Cancelled).

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26. (Cancelled).

27. (Cancelled).

5

28. (Cancelled).

29. The absorbent garment of claim 13 wherein the portions of said first and second body panels overlapped respectively by said first and second end regions of said absorbent composite are not elasticized.

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30. The absorbent garment of claim 13 wherein the connection along said center portions is formed as a continuous line of attachment.

ABSTRACT

An absorbent garment includes a body panel and an absorbent composite having a longitudinally extending length and a laterally extending width and including a backsheet, a topsheet and a retention portion disposed between the backsheet and the topsheet. The absorbent composite is connected to the body panel and includes a side margin that is not attached to the body panel and that extends laterally outboard and terminates in a free edge. In one preferred embodiment, the free edge does not extend along the entirety of the length of the absorbent composite. Rather, the entire width of an end of the absorbent composite is secured to the body panel. Preferably, the width of the side margin along the portion of the absorbent composite overlapping the body panel is relatively constant.



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FIG. 1

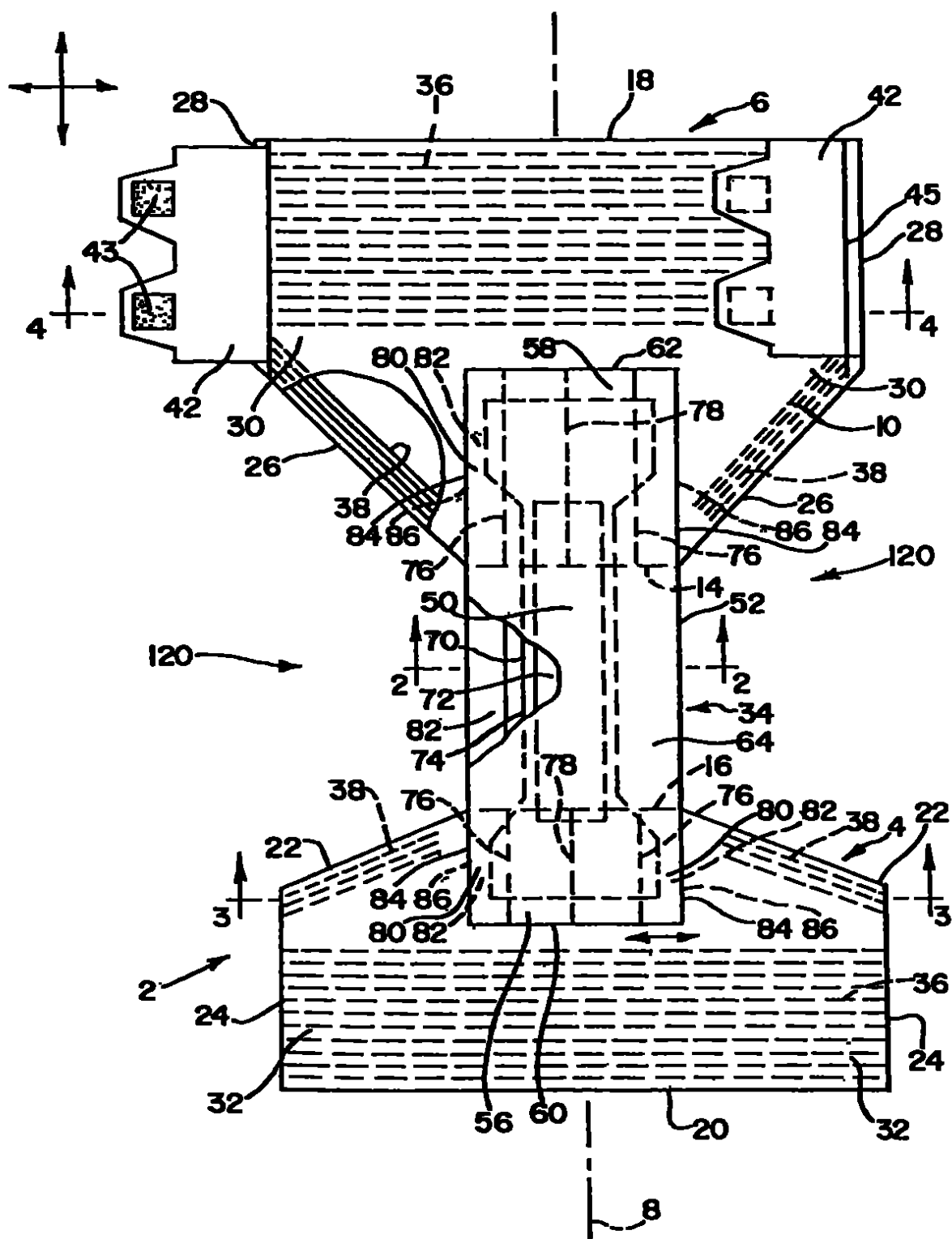


FIG. 2

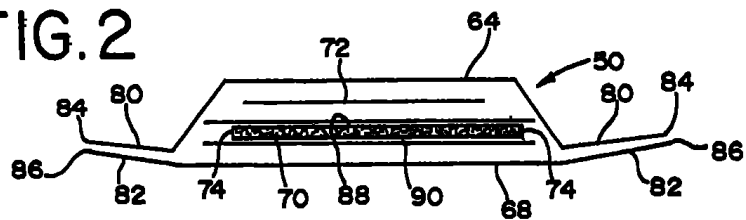


FIG. 3

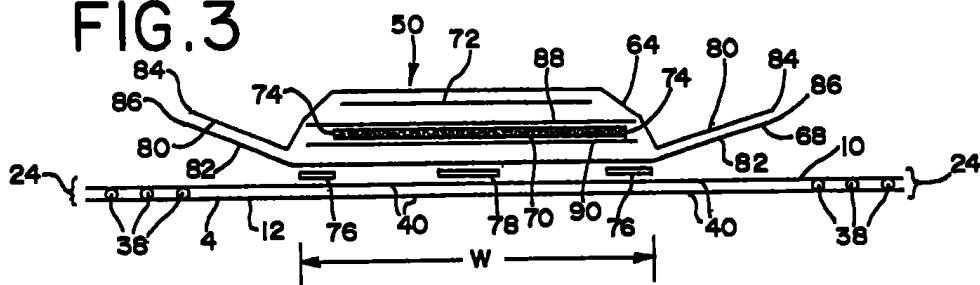
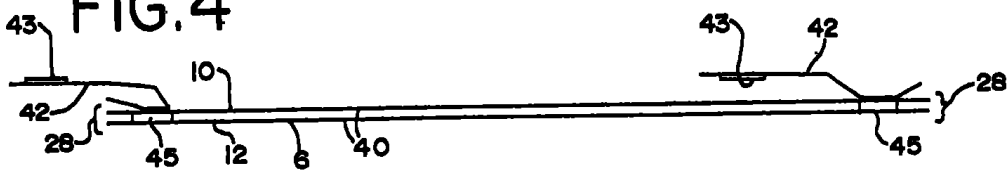
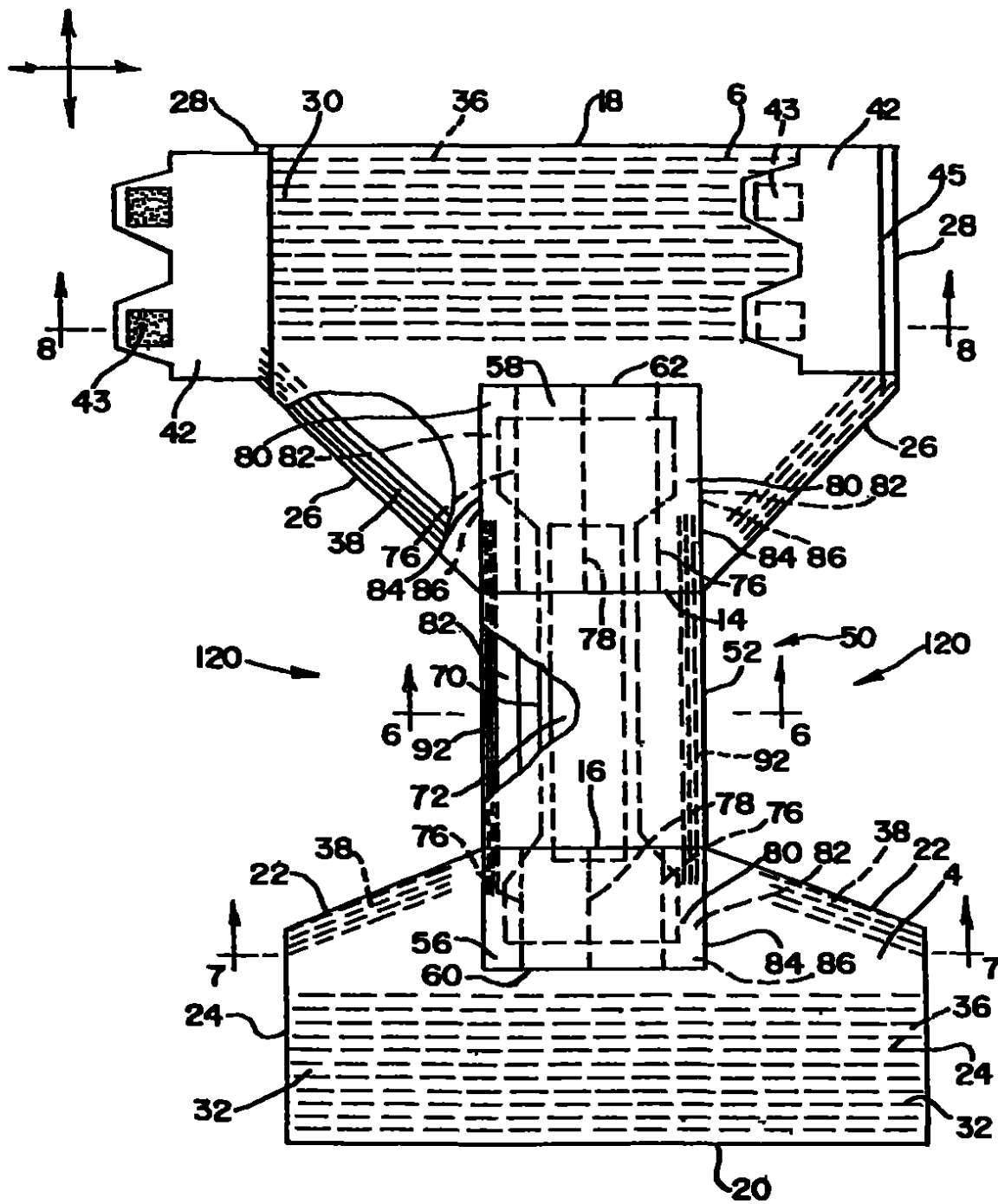


FIG. 4



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FIG. 5



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FIG.6

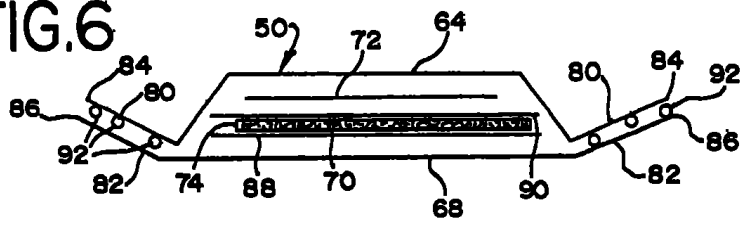


FIG.7

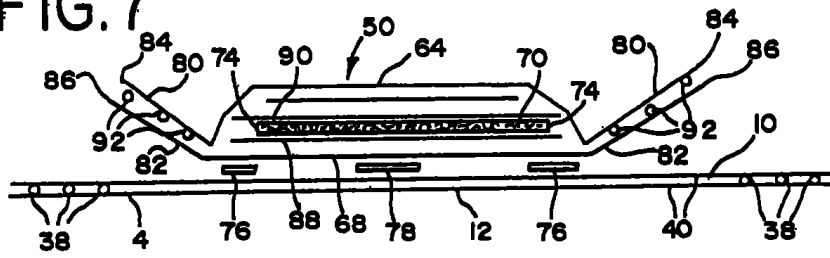
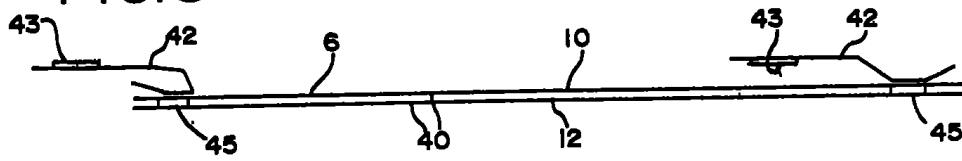


FIG.8



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FIG.9

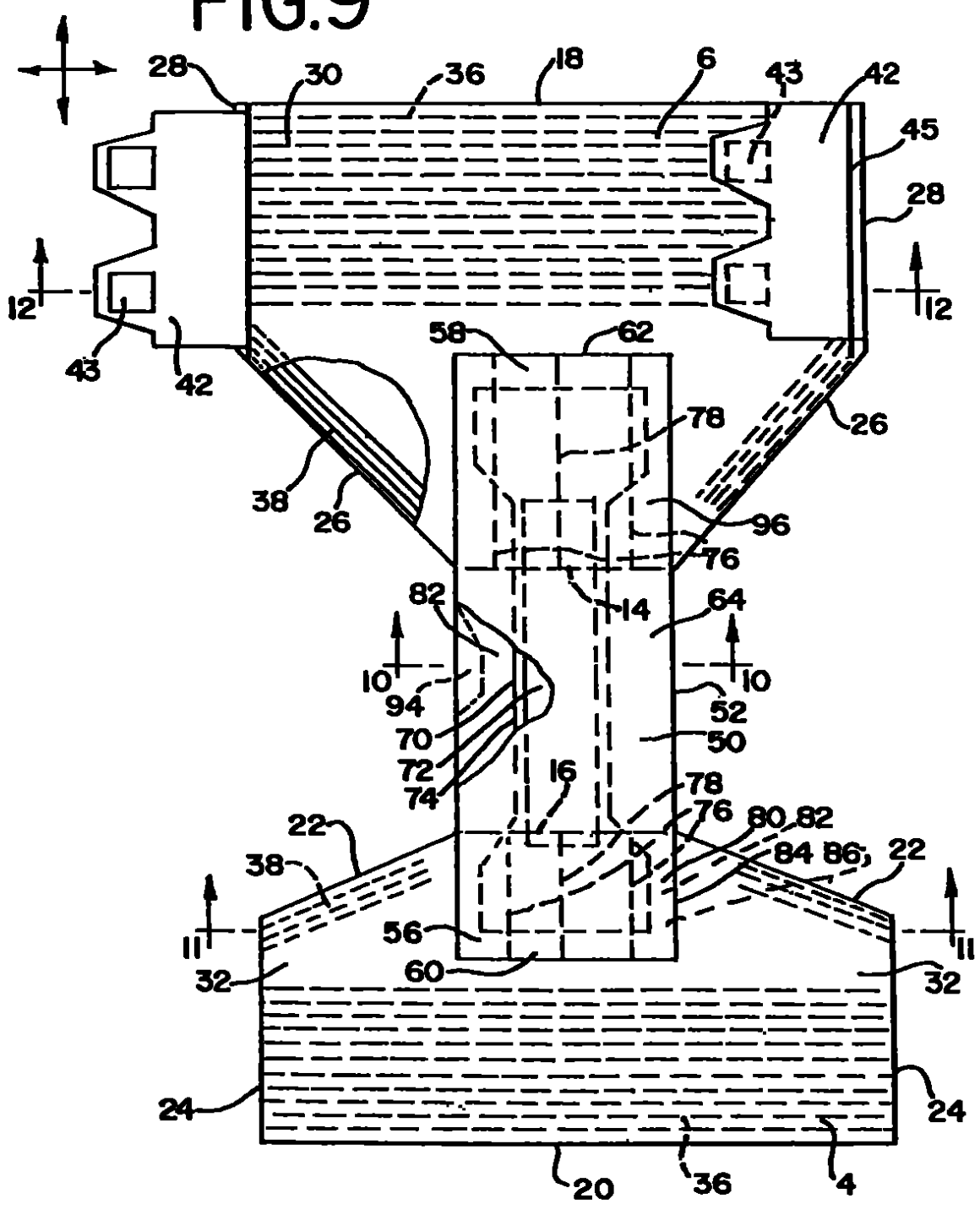


FIG.10

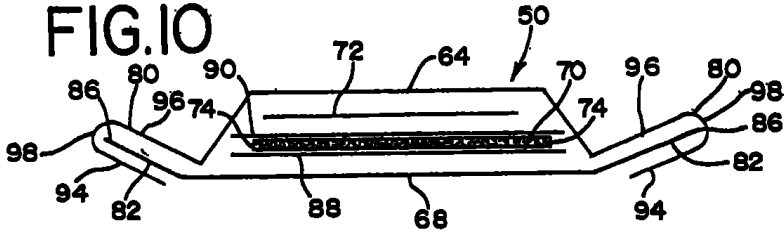


FIG.11

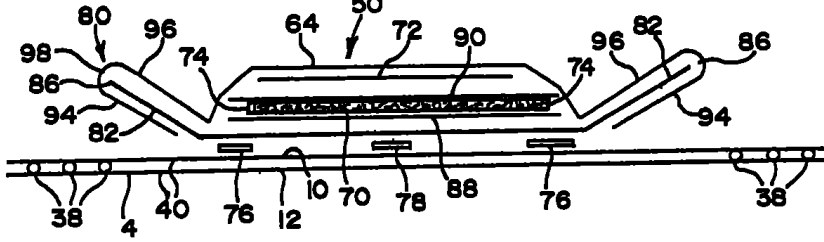
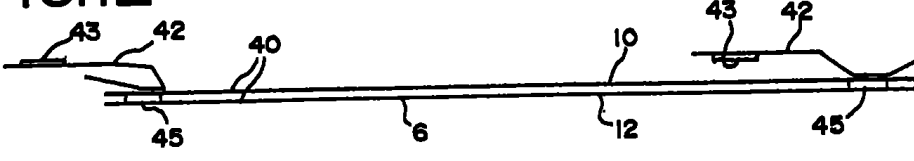


FIG.12



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FIG.14

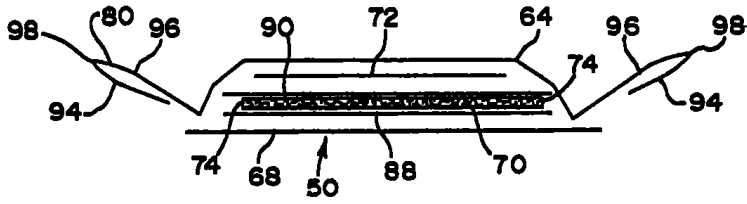


FIG.15

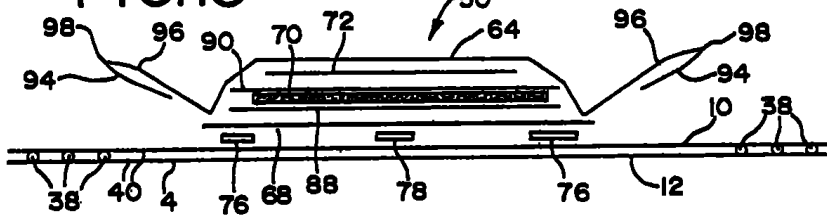
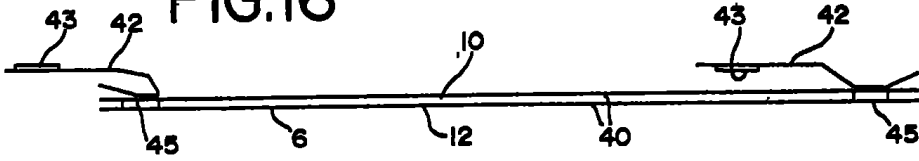


FIG.16



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FIG. 17

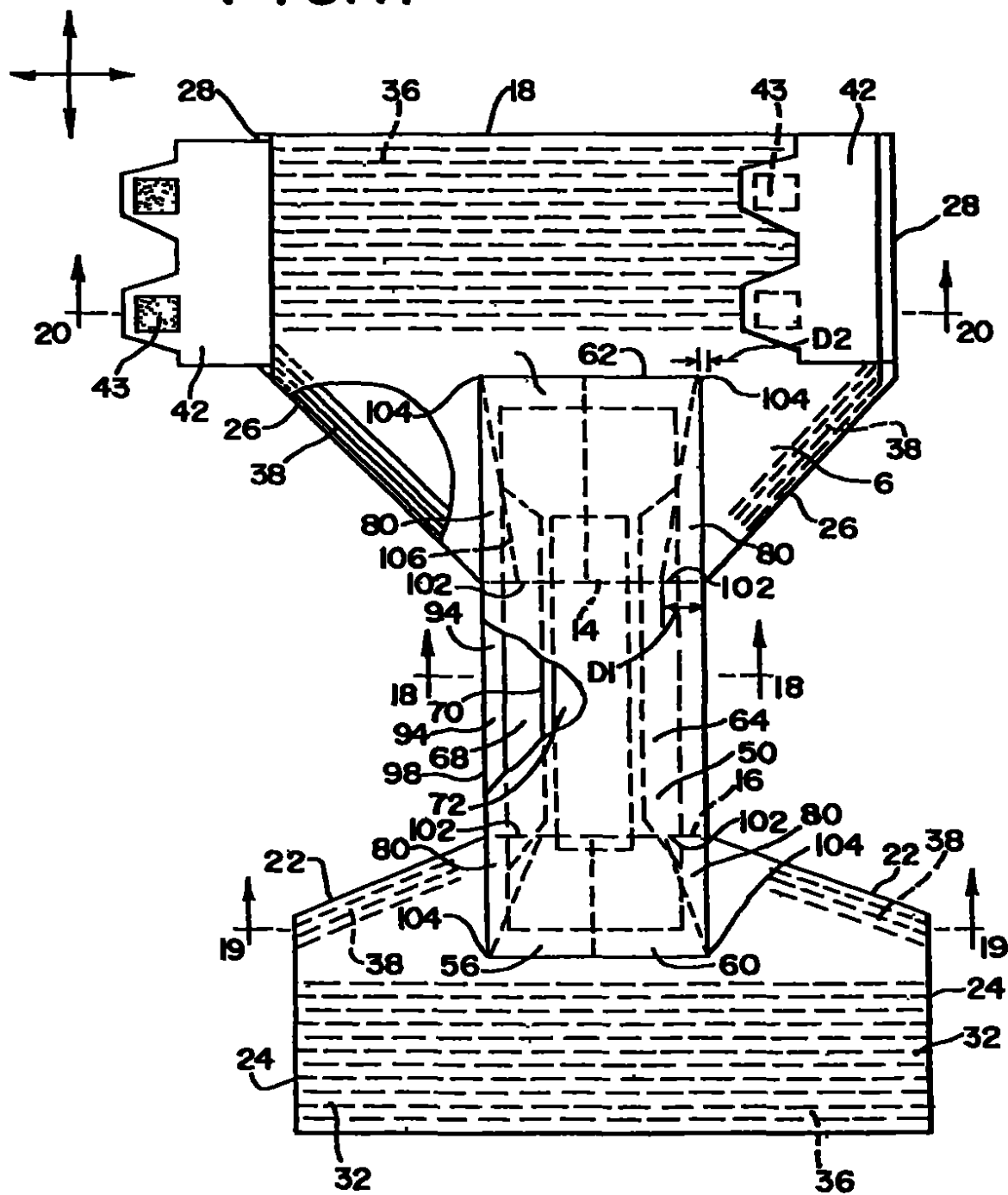


FIG.18

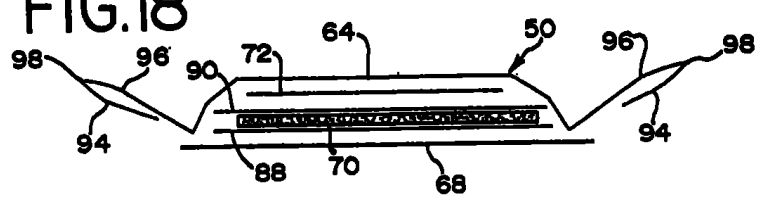


FIG.19

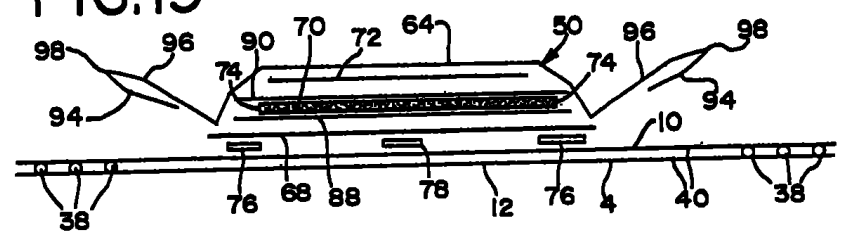
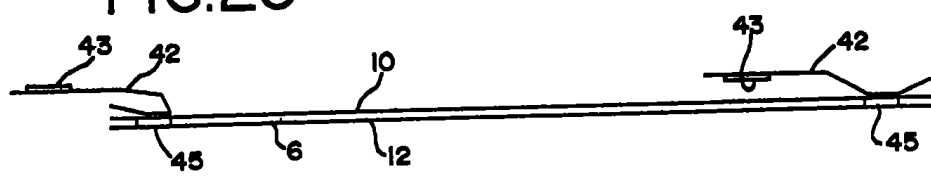


FIG.20



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[Handwritten signature]

FIG.21

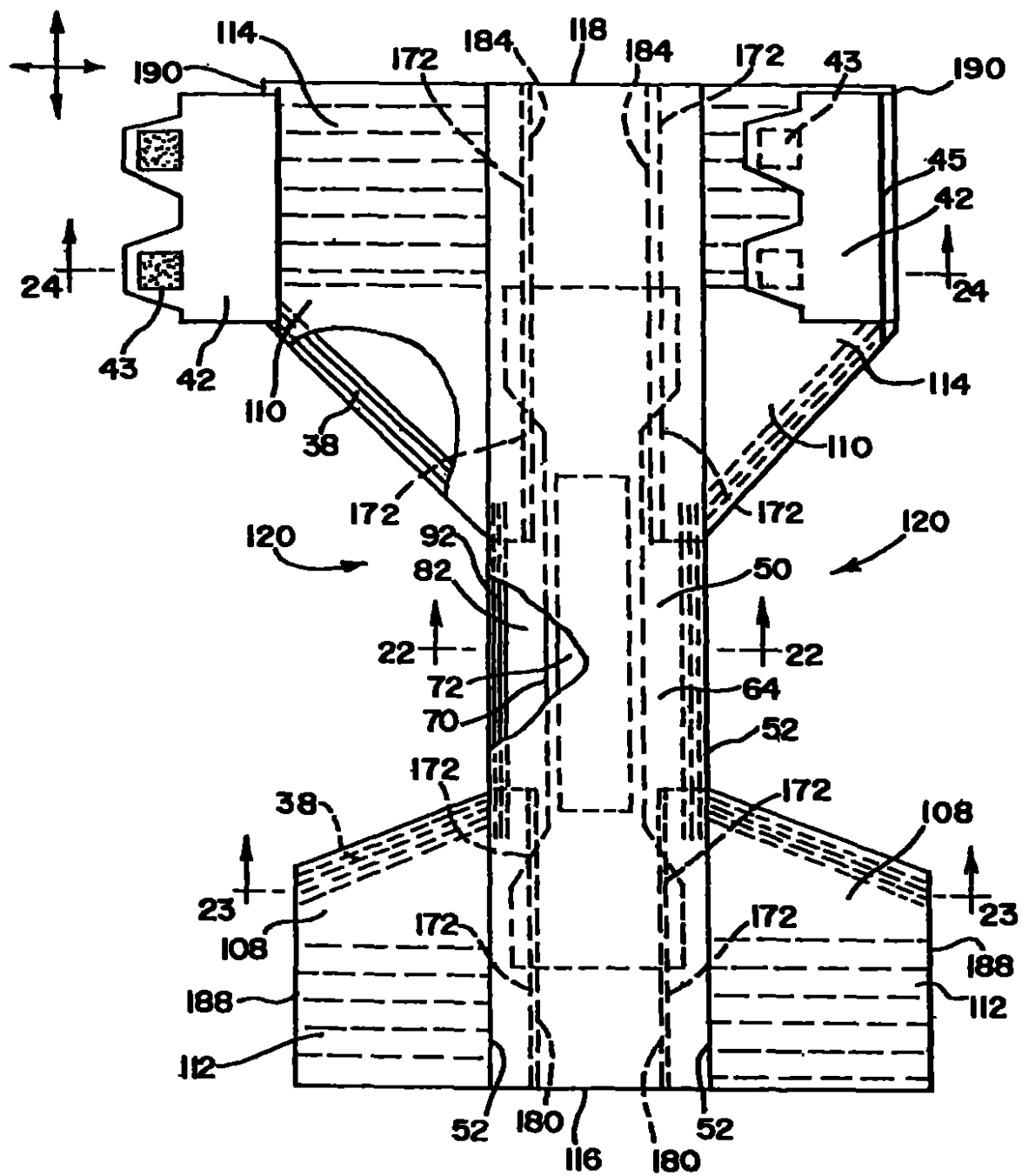


FIG.22

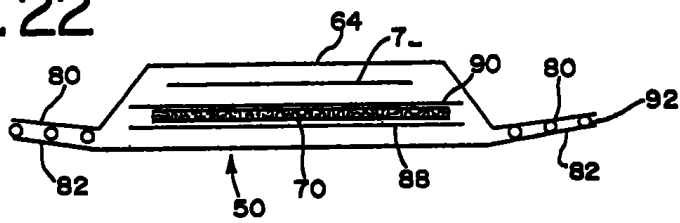


FIG.23

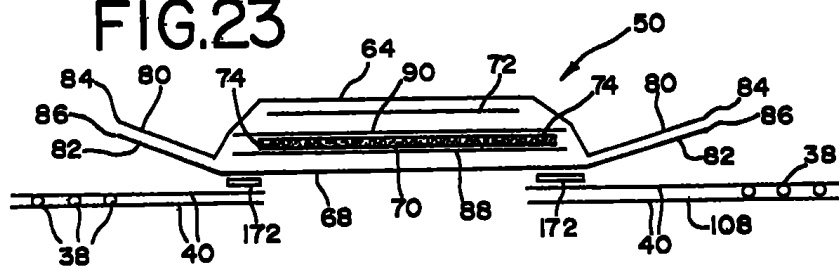
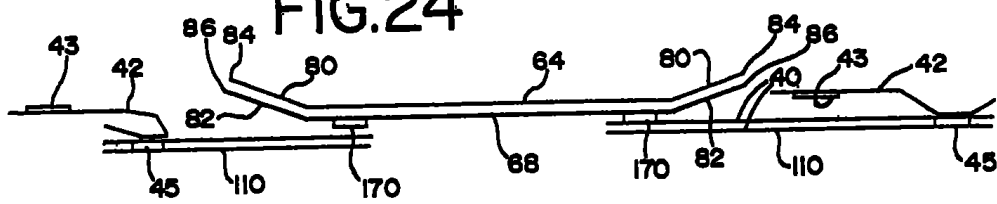


FIG.24



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FIG.25

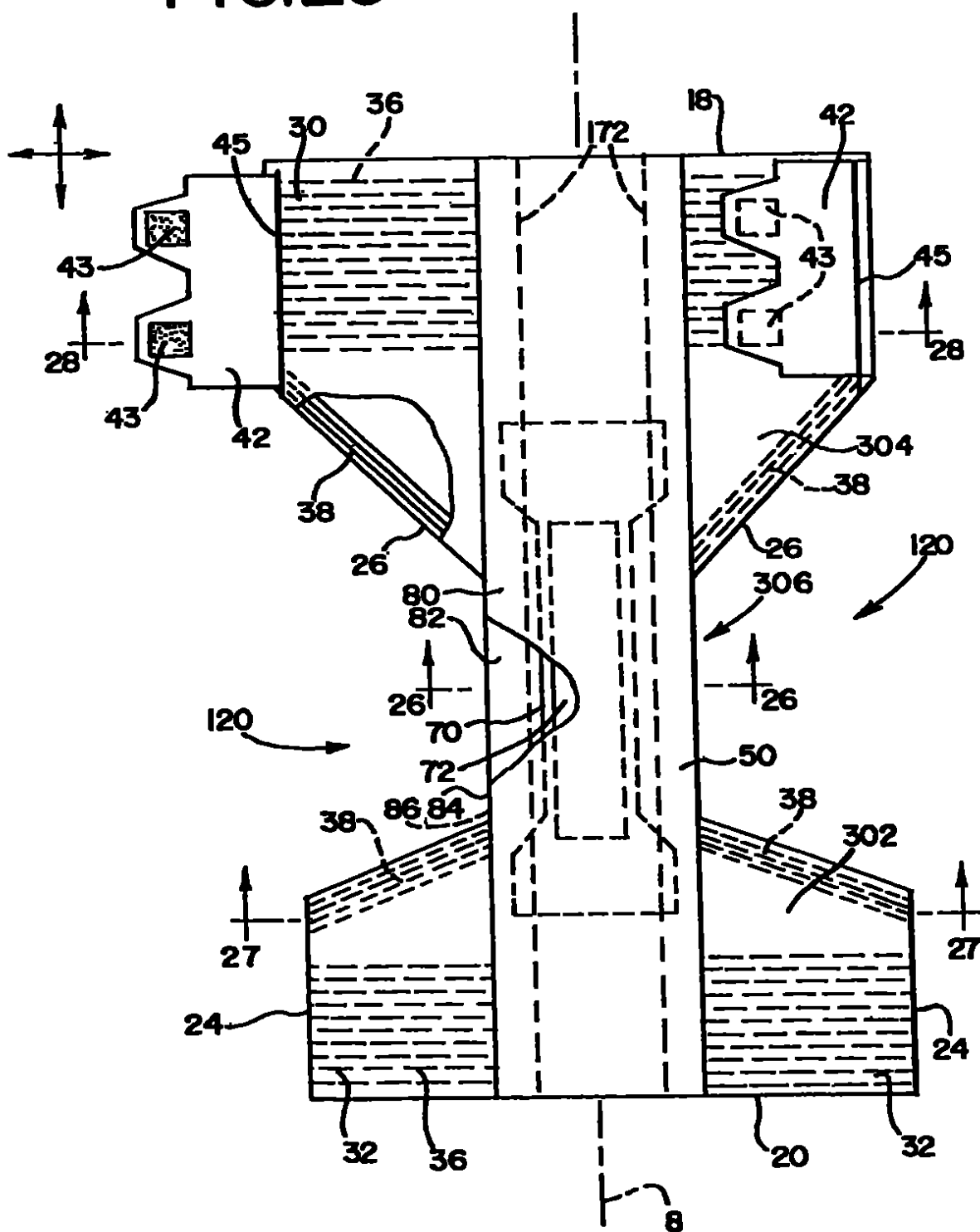


FIG.26

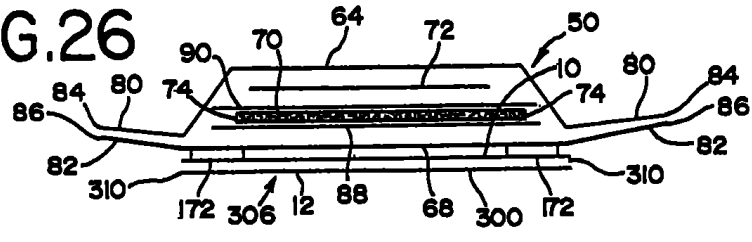


FIG.27

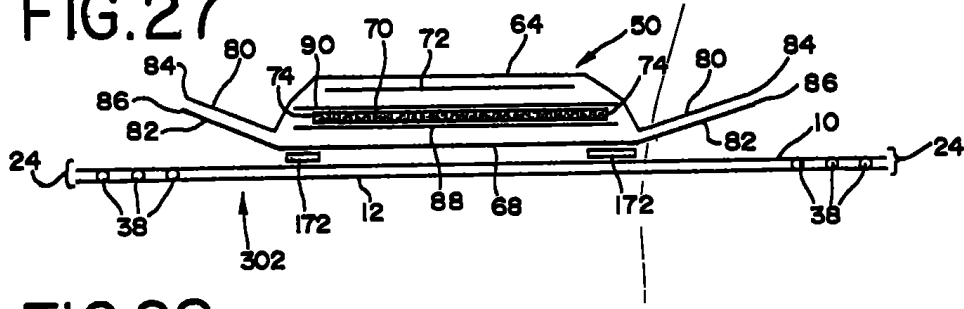
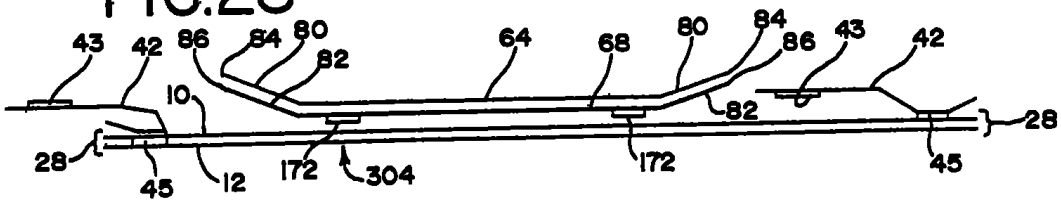


FIG.28



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The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the file.

IPEA/ US

PCT

DEMAND

CHAPTER H

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only			
Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 658/882	
International application No. PCT/US02/26702	International filing date (day/month/year) 22 August 2002 (22.08.02)	(Earliest) Priority date (day/month/year) 02 November 2001 (02.11.01)	
Title of invention ABSORBENT ARTICLE HAVING A BODY CONFORMING ABSORBENT COMPOSITE			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) KIMBERLY-CLARK WORLDWIDE, INC. 401 North Lake Street Neenah, Wisconsin 54956 United States of America		Telephone No.	
		Facsimile No.	
		Teleprinter No.	
		Applicant's registration No. with the Office	
State (that is, country) of nationality: US		State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
☐ Further applicants are indicated on a continuation sheet.			

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative
and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.
☐ is hereby appointed and any earlier appointment of (an) agent(s) /common representative is hereby revoked.
☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: (Family name followed by given name; for a legal entity, full official
The address must include postal code and name of country.)

STOVER, Andrew D.
BRINKS HOFER GILSON & LIONE
NBC Tower - Suite 3600
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Chicago, Illinois 60611
United States of America

Telephone No.
312-321-4200

Facsimile No.
312-321-4299

Teleprinter No.

Agent's registration No. with the Office
38,629

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed.

the description ☒ as originally filed
☐ as amended under Article 34

the claims ☒ as originally filed
☐ as amended under Article 19 (together with any accompanying statement)
☐ as amended under Article 34

the drawings ☒ as originally filed
☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (This check-box may be marked only where the time limit under Article 19 has not yet expired.)

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: **ENGLISH**

- ☒ which is the language in which the international application was filed.
☐ which is the language of a translation furnished for the purposes of international search.
☐ which is the language of publication of the international application.
☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT)

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

			For International Preliminary Examining Authority use only	
			received	not received
1.	translation of international application	sheets	☐	☐
2.	amendments under Article 34	sheets	☐	☐
3.	copy (or, where required, translation) of amendments under Article 19	sheets	☐	☐
4.	copy (or, where required, translation) of statement under Article 19	sheets	☐	☐
5.	letter	sheets	☐	☐
6.	other (specify)	sheets	☐	☐

The demand is also accompanied by the item(s) marked below:

- | | |
|--|--|
| 1. ☒ fee calculation sheet | 5. ☐ statement explaining lack of signature |
| 2. ☐ original separate power of attorney | 6. ☐ sequence listing in computer readable form |
| 3. ☐ original general power of attorney | 7. ☒ other (specify): cert of service, cheque and postcard |
| 4. ☐ copy of general power of attorney; reference number, if any: | |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


 Andrew B. Slover
 Attorney for Applicant

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PCT

FEE CALCULATION SHEET

Annex to the Demand

International application No. PCT/US02/26702		For International Preliminary Examining Authority use only	
Applicant's or agent's file reference 659/982		Date stamp of the IPEA	
Applicant KIMBERLY-CLARK WORLDWIDE, INC.			
CALCULATION OF PRESCRIBED FEES			
1. Preliminary examination fee		750.00	P
2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i>		146.00	H
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box		896.00	
		TOTAL	
MODE OF PAYMENT			
☐ authorization to charge deposit account with the IPEA (see below)	☐ cash		
☒ cheque	☐ revenue stamps		
☐ postal money order	☐ coupons		
☐ bank draft	☐ other (specify):		
AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT <i>(This mode of payment may not be available at all IPEAs)</i>			
☐ Authorization to charge the total fees indicated above.	IPEA/ US	Deposit Account No.: 23-1925	
☒ <i>(This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.</i>	Date: April 10, 2003	Name: Andrew D. Stover	
	Signature: 		

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PCT REQUEST

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0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.92 (updated 01.06.2002)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	United States Patent and Trademark Office (USPTO) (RO/US)
0-7	Applicant's or agent's file reference	17585
I	Title of invention	ABSORBENT GARMENT HAVING A BODY CONFORMING ABSORBENT COMPOSITE
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States
II-4	Name	KIMBERLY-CLARK WORLDWIDE, INC.
II-5	Address:	401 N. Lake Street Neenah, WI 54956 United States of America
II-6	State of nationality	US
II-7	State of residence	US
II-8	Telephone No.	(920) 721-2447
II-9	Facsimile No.	(920) 721-7339
III-1	Applicant and/or inventor	
III-1-1	This person is:	inventor only
III-1-4	Name (LAST, First)	BALOGH, Bridget, A.
III-1-5	Address:	349 Cleveland Street Menasha, WI 54952 United States of America
III-2	Applicant and/or inventor	
III-2-1	This person is:	inventor only
III-2-4	Name (LAST, First)	BISHOP, David, F.
III-2-5	Address:	N9632 Darboy Drive Appleton, WI 54915 United States of America

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III-3	Applicant and/or inventor	
III-3-1	This person is:	inventor only
III-3-4	Name (LAST, First)	MINNICH, Danielle, K.
III-3-5	Address:	111 East Water Street, Apt. #203 Appleton, WI 54911 United States of America
IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	STOVER, Andrew, D.
IV-1-2	Address:	BRINKS HOFER GILSON & LIONE NBC Tower - Suite 3600 455 North Cityfront Plaza Drive Chicago, IL 60611 United States of America
IV-1-3	Telephone No.	(312) 321-4200
IV-1-4	Facsimile No.	(312) 321-4299
IV-1-5	Agent's registration No.	38629
IV-2	Additional agent(s)	agent
IV-2-1	Name (LAST, First)	CONNELLY, Thomas, J.
IV-2-2	Address:	401 N. Lake Street Neenah, WI 54956 United States of America
IV-2-3	Telephone No.	(920) 721-2455
IV-2-4	Facsimile No.	(920) 721-7339
IV-2-6	Agent's registration No.	28404
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW NZ SD SL SZ TZ UG ZM ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE BG CH&LI CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT

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V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH&LI CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW
V-3	Precautionary Designation Statement In addition to the designations made under Items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under Item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI-1	Priority claim of earlier national application	
VI-1-1	Filing date	02 November 2001 (02.11.2001)
VI-1-2	Number	10/053,251
VI-1-3	Country	US
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)
VIII	Declarations	Number of declarations
VIII-1	Declaration as to the identity of the inventor	-
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	1
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	1
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-

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VIII-2-1	Declaration: Entitlement to apply for and be granted a patent Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(II) and 51bis.1(a)(II)), in a case where the declaration under Rule 4.17(IV) is not appropriate: Name:	in relation to this international application KIMBERLY-CLARK WORLDWIDE, INC. is entitled to apply for and be granted a patent by virtue of the following:
VIII-2-1 (iv)		an assignment from BALOGH, Bridget, A. to KIMBERLY-CLARK WORLDWIDE, INC., dated 04 April 2002 (04.04.2002)
VIII-2-1 (iv)		an assignment from BISHOP, David, F. to KIMBERLY-CLARK WORLDWIDE, INC., dated 10 April 2002 (10.04.2002)
VIII-2-1 (iv)		an assignment from MINNICH, Danielle, K. to KIMBERLY-CLARK WORLDWIDE, INC., dated 04 April 2002 (04.04.2002)
VIII-2-1 (ix)	This declaration is made for the purposes of:	all designations

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VIII-3-1	Declaration: Entitlement to claim priority Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(II) and 51bis.1(a)(II)): Name:	in relation to this international application KIMBERLY-CLARK WORLDWIDE, INC. is entitled to claim priority of earlier application No. 10/053,251 by virtue of the following:
VIII-3-1 (iv)		an assignment from BALOGH, Bridget, A. to KIMBERLY-CLARK WORLDWIDE, INC., dated 04 April 2002 (04.04.2002)
VIII-3-1 (iv)		an assignment from BISHOP, David, F. to KIMBERLY-CLARK WORLDWIDE, INC., dated 10 April 2002 (10.04.2002)
VIII-3-1 (iv)		an assignment from MINNICH, Danielle, K. to KIMBERLY-CLARK WORLDWIDE, INC., dated 04 April 2002 (04.04.2002)
VIII-3-1 (b)	This declaration is made for the purposes of:	all designations

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IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	6	-
IX-2	Description	26	-
IX-3	Claims	6	-
IX-4	Abstract	1	EZABST00.TXT
IX-5	Drawings	15	-
IX-7	TOTAL	54	
	Accompanying items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-9	Original separate power of attorney	✓	-
IX-17	PCT-EASY diskette	-	Diskette
IX-18	Other (specified):	Post Card	-
IX-19	Figure of the drawings which should accompany the abstract	29	
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative	<i>Thomas J. Connelly</i>	
X-1-1	Name (LAST, First)	CONNELLY, Thomas, J.	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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PCT (ANNEX - FEE CALCULATION SHEET)

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(This sheet is not part of and does not count as a sheet of the International application)

0	For receiving Office use only	
0-1	International Application No.	
0-2	Date stamp of the receiving Office	
0-4	Form - PCT/RO/101 (Annex) PCT Fee Calculation Sheet Prepared using	PCT-EASY Version 2.92 (updated 01.06.2002)
0-9	Applicant's or agent's file reference	17585
2	Applicant	KIMBERLY-CLARK WORLDWIDE, INC.
12	Calculation of prescribed fees	fee amount/multiplier Total amounts (USD)
12-1	Transmittal fee T	⇒ 240
12-2-1	Search fee S	⇒ 866
12-2-2	International search to be carried out by	EP
12-3	International fee	
	Basic fee (first 30 sheets) b1	407
12-4	Remaining sheets	24
12-5	Additional amount (X)	9
12-6	Total additional amount b2	216
12-7	b1 + b2 = B	623
12-8	Designation fees	
	Number of designations contained in international application	93
12-9	Number of designation fees payable (maximum 5)	5
12-10	Amount of designation fee (X)	88
12-11	Total designation fees D	440
12-12	PCT-EASY fee reduction R	-125
12-13	Total international fee (B+D-R) I	⇒ 938
12-14	Fee for priority document	
	Number of priority documents requested	1
12-15	Fee per document (X)	15
12-16	Total priority document fee P	⇒ 15
12-17	TOTAL FEES PAYABLE (T+S+I+P)	⇒ 2,059
12-18	Mode of payment	authorization to charge deposit account
12-20	Deposit account instructions	
	The receiving Office:	United States Patent and Trademark Office (USPTO) (RO/US)
12-20-1	Authorization to charge the total fees indicated above.	✓

PCT (ANNEX - FEE CALCULATION SHEET)

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12-20-2	Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	✓
12-20-3	Authorization to charge the fee for priority document.	✓
12-21	Deposit account No.	11-0875
12-22	Date	22 August 2002 (22.08.2002)
12-23	Name and signature	CONNELLY, Thomas, J. <i>Thomas J. Connelly</i>

VALIDATION LOG AND REMARKS

13-2-2	Validation messages States	Green? More designations could be made. The following States have not been designated: US. Please verify.
13-2-8	Validation messages Fees	Green? Please confirm that fee schedule utilized is the latest available
13-2-9	Validation messages Payment	Green? Please ensure that you have a valid deposit account with the receiving Office selected.

(43) Date of A publication 02.08.1992

(21) Application No 9203945.8

(22) Date of filing 10.02.1992

6904 **Priority date**

(81) 630-50-400

(32) 01.02.1001

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(51) INT CL¹
ADIF 13/72

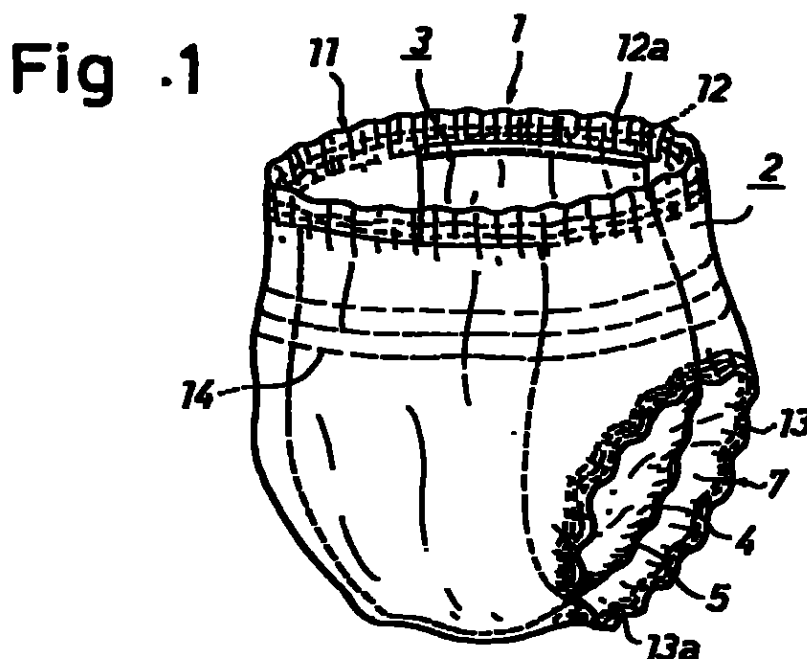
(52) UK CL (Edition I)
A3V V1B3B V3C4 V3H1

(56) Documents cited
GB 2163991 A GB 2124072 A GB 1629749 A
EP 0274763 A2 WO 88/07337 A1

(99) Field of search
 LK CL (Edition K) A3V
 INT CL⁶ A91F 13/72

(54) Diaper of the briole type

(57) A diaper includes an absorbent body 3 and a water impermeable outermost layer 2 to which the absorbent body is fastened and which holds the absorbent body against the body of the user. The absorbent body comprises a liquid impermeable outer sheet (18, Fig. 3), a liquid permeable inner sheet (15) and an absorbent member (17) therebetween. The outermost layer 2 has front and rear portions whose edges (8, 9, Fig. 2) are connected together, e.g. by welding, so that it is in the form of a pair of brisls with a waist opening 11 and two leg openings 7. The outermost layer 2 carries at least one extensible elastic member 12, 13 around the waist opening and the leg openings which form gathers around those openings. The absorbent body 3 may be removably fastened to outermost layer 2, e.g. by peelable adhesive connections (A).



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Fig .1

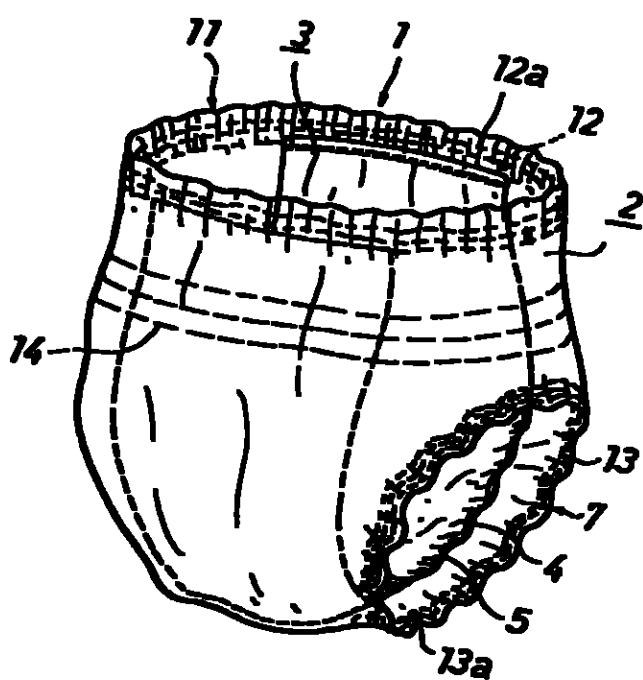
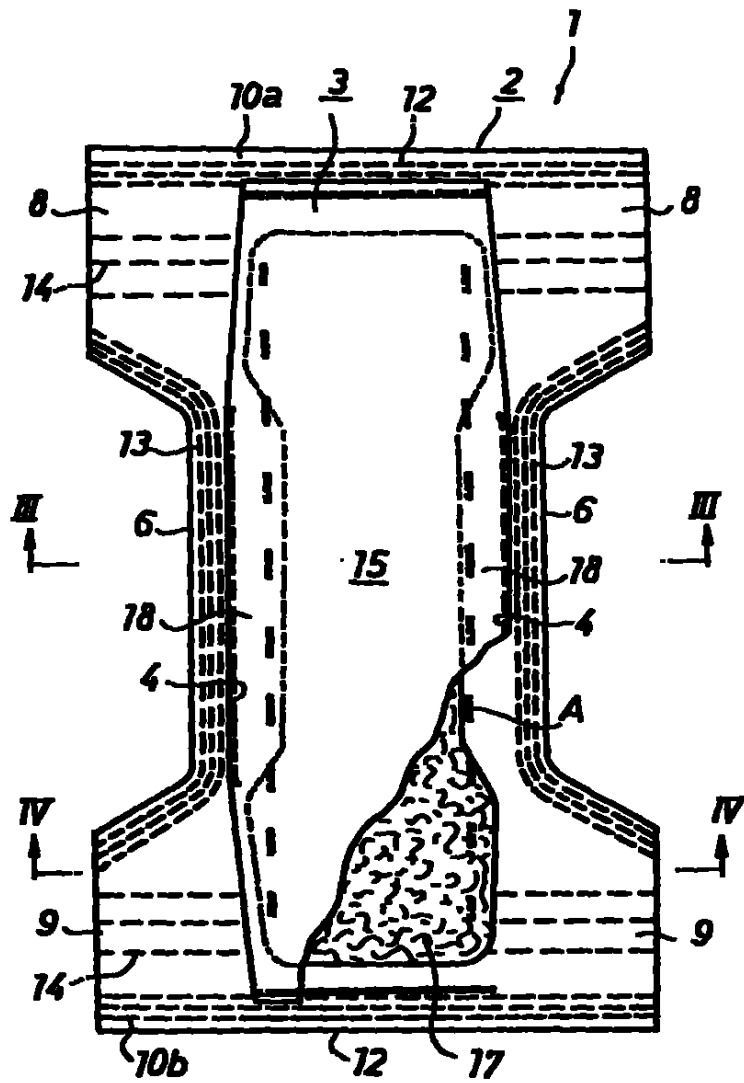


Fig. 2



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Fig .3

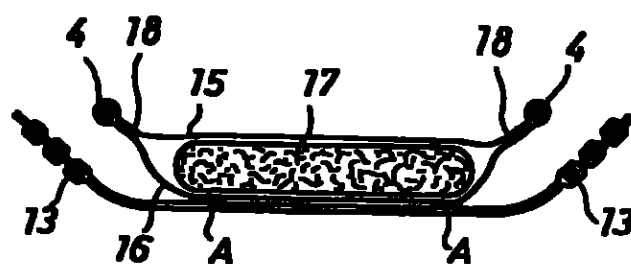
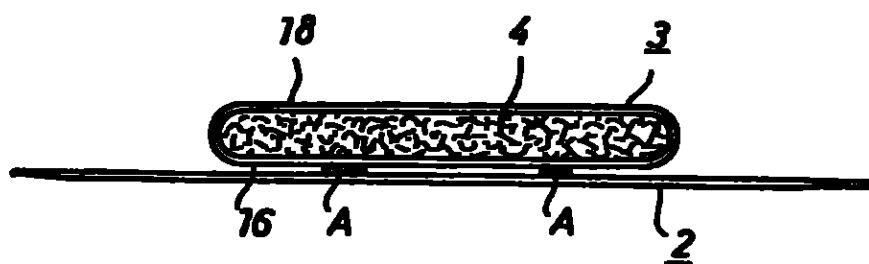


Fig .4



DIAPERS

The invention relates to diapers for use by babies, children or incontinent adults and is concerned with that type of diaper which is of briefs type, that is to say is in the form of a pair of pants or shorts.

The most widely used type of disposable diaper is of so-called flat type, as disclosed for example in Japanese Patent Publication No. Sho 52-40267, which has a main body comprising a liquid permeable inner sheet, a liquid impermeable outer sheet and an absorbent member disposed therebetween. The main body is provided with a side flap extending laterally from each side edge thereof. Each side flap is provided with an expansible member forming a gather. Each side flap is further provided with fastener means on the rear surface of its side edge in order to provide adjustability so as to improve the fit and anti-leakage properties of the diaper. Another known diaper is of the type disclosed in Japanese Patent Early Laid-open Publication No. Sho 62-250201, in which three dimensional gathers are formed on the leg portions and a flap portion around the absorbent member is provided with a water-repellent treatment in order to improve the anti-leakage characteristics.

In order to improve the fit and ease of wear, a disposable diaper of so-called briefs type has recently been proposed in Japanese Patent Early Laid-open Publication No. Sho 57-77304. In this diaper, a front area and a back area of a pair of side flaps are connected together in order to form a pair of leg

opening portions and a waist opening portion. The leg opening portions and the waist opening portion are designed to be expansible in order to facilitate an easy fit to the wearer's body. Such a briefs type disposable diaper can usually be worn by a wearer in a standing posture. Therefore, it is often conveniently used as training wear for infants who need a training to do without a diaper, or as underwear for incontinent persons or adults who find it impossible to walk.

However, since the above-mentioned briefs type disposable diaper is necessarily relatively narrow in the under-crotch portion, the expansible elastic member cannot be positioned remote from the absorbent member. As a result, the intended expansibility of the elastic member is not available due to the effect of the rigidity of the absorbent member. Furthermore, the connected portion of the front and back areas are readily wrinkled and spaced apart because of the provision of the expansible elastic member, thus providing a route for the leakage of waste materials. Furthermore, it was found not to be possible to provide a three-dimensional structure of the leg gathers, which is very effective for anti-leakage purposes, due to the narrowness of the under-crotch portion and manufacturing difficulties.

The effective technique for making the peripheral portions water-repellent in order to prevent leakage, particularly of urine, was unable to exhibit its full effect in a briefs type diaper because in practice the narrow under-crotch portion prohibited the formation of clearly separate hydrophilic and water-repellent

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portions. Moreover, the conventional method for making a briefs type diaper rendered it impossible to provide a water-repellent portion around the waist portion.

It is only in the vicinity of the urine discharge point that the conventional disposable diaper functions to absorb and return waste materials. Therefore, only the vicinity of the urine discharge point becomes soiled, and other portions, such as the side portions of the waist, do not become substantially soiled. It is, therefore, wasteful and uneconomical to dispose of the whole diaper.

It is therefore an object of the present invention to provide a disposable diaper of briefs type which is capable of reliably preventing leakage of waste materials, which has an excellent fit and which may be worn by wearers of various sizes.

Another object of the invention is to provide a disposable diaper which allows the exchange and disposal of only that portion which becomes soiled with waste materials.

According to the present invention a diaper includes an absorbent body comprising a liquid permeable inner sheet, a liquid impermeable outer sheet and an absorbent member disposed therebetween, and a water impermeable outermost layer to which the absorbent body is fastened and which, in use, holds the absorbent body against the body of the user, the outermost layer having front and rear portions whose edges are connected together so that it is in the form of a pair

openings 7 when the flaps 8 and 9 are connected to form the briefs, as shown in Figure 1. As shown in Figures 2 to 4, the absorbent body 3 is of generally elongate rectangular shape smaller than the outermost layer 2 and extends over the crotch portion of the sheet 2 between points adjacent the ends of the sheet 2. Each side edge of the absorbent body 3 is provided with a first elastic member 4 extending over the length of the associated concavity 6 thereby forming a leg gather 5 on the absorbent body 3.

The absorbent body 3 is secured peelably and generally centrally in the longitudinal direction, to the inner surface of the outermost layer sheet 2 by two parallel interrupted lines of adhesive material A.

As mentioned above, the edges of the side flaps 8 are connected to those of the side flaps 9, e.g. by welding to make the diaper of briefs type. Between the ends of the absorbent body 3 and the associated ends of the outermost layer 2 there are waist flaps 10a, 10b extending outwardly of the absorbent body 3, which define a waist opening 11 when the diaper is in the configuration of a pair of briefs. Extending around each of the waist flaps 10a and 10b are stretched second elastic members 12 which form a waist gather 12a around the waist opening 11. Extending along the edges of each concave portion 6, laterally outside the associated side edge of the absorbent body 3, are third elastic members 13 which form gathers 13a around each leg opening 7. The fit of the diaper to the wearer is thus improved and slipping down of the diaper is prevented when it is worn. A number of fourth elastic

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members 14 extend in or on the front and back portions of the outermost layer 2 at positions between the waist opening 11 and the leg opening portions 7, so that the diaper fits the wearer better, particularly around the body.

The absorbent main body 3 is positioned such that when it is adhered to the outermost layer 2, the gather 13a around each leg opening caused by the third elastic members 13 does not overlap with the associated gather 5 in the body 3. The absorbent body 3 comprises a liquid permeable inner sheet 15 which, in use, contacts the wearer's skin, a liquid impermeable outer sheet 16 and an absorbent member 17 interposed therebetween. The absorbent body 3 is provided with main body flaps 18 extending laterally from each side edge of the absorbent member 17, and the first elastic members 4 for forming the gathers 5 are provided in the side edges of the main body flaps 18 and are stretched in the longitudinal direction of the absorbent body 3.

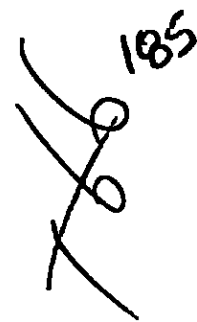
The absorbent main body 3 is adhered at its bottom surface, i.e. at the outer sheet 16, to the outermost layer 2 by the adhesive A which is inside the body flaps 18 so that the leg gathers 5 can be easily formed.

The inner sheet 15 is liquid permeable so as to permit waste materials to permeate therethrough into the absorbent member 17 and to have a feel approximating to that of conventional underwear. Examples of such liquid permeable sheets are woven fabrics, nonwoven fabrics, perforated films and the like. Leakage of

urine, etc. through the peripheral portion of the inner sheet 15 can be prevented by applying a water-repellent treatment to the peripheral portion thereof, e.g. by applying a hydrophobic compound such as oil solution of the silicon series, paraffin wax or the like to the peripheral portion 2 or applying a hydrophilic compound, such as an alkyl phosphate, to the entire inner sheet 15 and then cleaning the peripheral portion with warm water.

The outer sheet 16 is a liquid impermeable sheet, e.g. formed by stretching a thermoplastic resin with an added filler and having moisture permeable properties or a sheet having a feel similar to that of the wearer's underwear, such as a composite material composed of a film and a non-woven fabric or a film and a woven fabric.

The absorbent material 17 is preferably formed chiefly of an open cell pulp but also of a high molecular weight absorbent polymer. Another preferred composition of the absorbent member 17 is a mixture of a thermoplastic resin, a cellulosic fibre, and a high molecular weight water absorbent polymer subjected to heat treatment. The high molecular weight water absorbent polymer may be located in any of the upper layer, intermediate layer and lower layer of the absorbent body and it may also be mixed with a pulp. The high molecular weight water absorbent polymer is preferably in granular form and able to absorb and retain more than twenty times its own weight of liquid and able to be gelled. Examples of such high molecular weight water absorbent polymers are

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starch-acrylic (salt) graft copolymer, a saponified material of starch-acrylonitrile copolymer, bridged material of sodium carboxymethylcellulose, acrylic (salt) polymer and the like. The absorbent member 17 is preferably of hourglass shape, as shown in Figure 2, but it may also be rectangular.

The outermost layer or sheet 2 is preferably a highly flexible sheet which is liquid impermeable but air permeable and which has a feel similar to that of conventional underwear. Examples of such a sheet are woven fabrics, non-woven fabrics and the like. which have been subjected to a water-repellent treatment. A highly flexible sheet, one or both surfaces of which are laminated with a non-woven fabric, is particularly preferred because it has a comfortable feel and an excellent ability to prevent oozing or leakage of urine.

The first, second, third and fourth elastic members 4, 12, 13 and 14 are connected to the absorbent body 3 and the outermost sheet 2 in generally stretched states by means known in the art, such as ultrasonic welding, heat welding, adhesive etc. Any material known in the art, such as yarn rubber, flat rubber, film type rubber or tape-like foam polyurethane can be used, and each elastic member may be unitary or multipart construction. The stress is particularly preferably 70 to 100g when they are stretched by 150%.

A known peelable adhesive material may be used as the adhesive material A, and such adhesive material A is adhered at a plurality of spots or linearly on the

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inner surface of the absorbent body 3.

Operation of the diaper is as follows:

The side edges of the side flaps 8 and 9 of the outermost sheet 2, as seen in the expanded state shown in Figure 2, are connected together to form a briefs type diaper having a waist opening 11 and a pair of leg openings 7. The absorbent main body 3 is peelably adhered to the inner surface of the sheet 2.

The legs of the wearer are inserted into the waist opening 11 and the diaper is then pulled up in order to insert the legs into the leg openings 7. When being worn, gathers are formed at the waist opening 11 of the outermost sheet 2 and at the leg openings 7 in order to improve the fit and compliance to the wearer and to prevent leakage. Moreover, the fit around the body is improved by virtue of the provision of the fourth elastic members 14 around the body.

The absorbent body 3 is also provided with leg gathers 5 so that waste materials may not leak from the absorbent body 3 onto the outermost layer 2. Since there are double gathers around each leg, i.e. the gathers 5 and 7, a reliable prevention of leakage through the leg openings is ensured.

After the absorbent member 17 has been soiled, the absorbent body 3 is peeled off the outermost sheet 2 and a new absorbent body 3 is adhered in its place. Thus only the soiled absorbent body 3 need be replaced and not the entire diaper.

It will be appreciated that the present invention is not limited to the embodiment described above, but can be modified in various ways.

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CLAIMS

1. A diaper including an absorbent body comprising a liquid permeable inner sheet, a liquid impermeable outer sheet and an absorbent member disposed therebetween, and a water impermeable outermost layer to which the absorbent body is fastened and which, in use, holds the absorbent body against the body of the user, the outermost layer having front and rear portions whose edges are connected together so that it is in the form of a pair of briefs with a waist opening and two leg openings, the outermost layer carrying at least one expansible elastic member around each leg opening which forms a gather around that opening.

2. A diaper as claimed in claim 1 in which the outermost layer includes a crotch portion connecting the front and rear portions and the absorbent body is elongate and overlies at least a proportion of the front, rear and crotch portions, each side edge of the absorbent body being unconnected to the outermost layer and being provided with at least one expansible member which forms a gather in the side edge, at least in that portion thereof which overlies the crotch portion.

3. A diaper as claimed in claim 1 or claim 2 in which the outermost layer carries a least one expansible elastic member around the waist opening which forms a gather around that opening.

4. A diaper as claimed in any one of claims 1 to 3 in which the outermost layer carries at least one expansible elastic member which extends across the

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front and rear portions at a position between the waist and leg openings and serves, in use, to tighten the outermost layer against the body of the wearer.

5. A diaper as claimed in any one of the preceding claims in which the outer sheet has water-repellent properties.

6. A diaper as claimed in any one of the preceding claims in which the absorbent body is removably fastened to the outermost layer.

7. A diaper as claimed in claim 6 in which the absorbent body is fastened to the outermost layer by a peelable adhesive connection.

8. A diaper substantially as specifically herein described with reference to the accompanying drawings.

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Relevant Technical fields

(i) UK Cl (Edition K) A3V

(ii) Int CL (Edition 5) A61F 13/72

Search Examiner

D BUCKLEY

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

24 APRIL 1992

Documents considered relevant following a search in respect of claims

1 TO 8

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB A 2183991 (PROCESS IMPROVEMENTS) whole document	1, 3, 5, 6 and 7
X	GB A 2124072 (DISPOSABLE DEVELOPMENTS) whole document	1, 3, 5 and 6
X	GB 1520740 (COURTAULDS) whole document	1 and 3 to 7
X	EP A2 0274753 (KIMBERLY-CLARK) see eg Claim 1 and lines 14 to 50 of column 11	1 to 3 at least
X	WO A1 88/07357 (KIMBERLY-CLARK) see eg Claim 1 and lines 3 to 5 of page 12	1 to 3 at least
		

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Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

- | | |
|---|---|
| X: Document indicating lack of novelty or of inventive step. | P: Document published on or after the declared priority date but before the filing date of the present application. |
| Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: Document indicating technological background and/or state of the art. | &: Member of the same patent family, corresponding document. |

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

United States Patent [19]

Saisaka et al.

[11] Patent Number: 5,624,424

[45] Date of Patent: Apr. 29, 1997

[54] DISPOSABLE DIAPER

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Japan

[21] Appl. No.: 391,649

[22] Filed: Feb. 21, 1995

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Nov. 11, 1994	[JP]	Japan	6-301694
Jan. 6, 1995	[JP]	Japan	7-015600

[51] Int. Cl.⁶ A61F 13/15

[52] U.S. Cl. 604/385.2; 604/385.1

[58] Field of Search 604/385.1, 385.2,
604/367, 358, 378

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6-43074	3/1994	Japan

Primary Examiner—Mary Beth Jones
Assistant Examiner—David I. Cho
Attorney, Agent, or Firm—Armstrong, Westerman, Hattori,
McClelland & Naughton

[57] ABSTRACT

A disposable diaper having an excellent fit to the wearer has an outer member (2) having front and back waist sections (4, 5) and crotch sections (6), and a liquid absorbent member (3), wherein the outer member includes an outermost sheet layer (21) and a pair of side liner sheet layers (22), and the liquid absorbent member includes a liquid non-permeable back sheet layer (13), a liquid permeable top sheet layer (14) and a liquid absorbent pad layer (15) interposed between the back and top sheet layers, each side liner sheet layer being formed from a composite sheet including an elastic sheet ply capable of expansion and contraction in the transversal direction of the diaper and at least one non-elastic sheet ply laminated on at least one surface of the elastic sheet ply and capable of elongation in the transversal direction of the diaper.

12 Claims, 9 Drawing Sheets

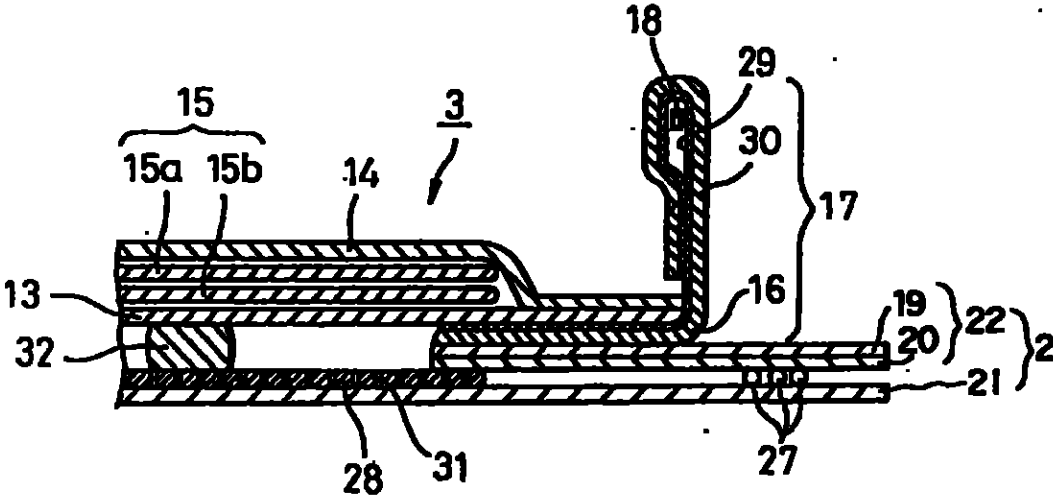


Fig.1

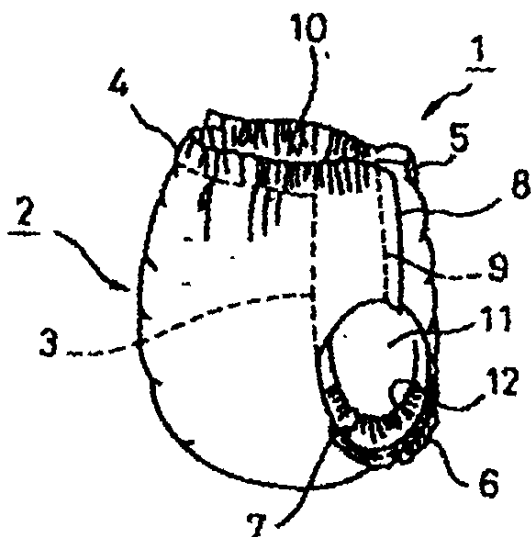
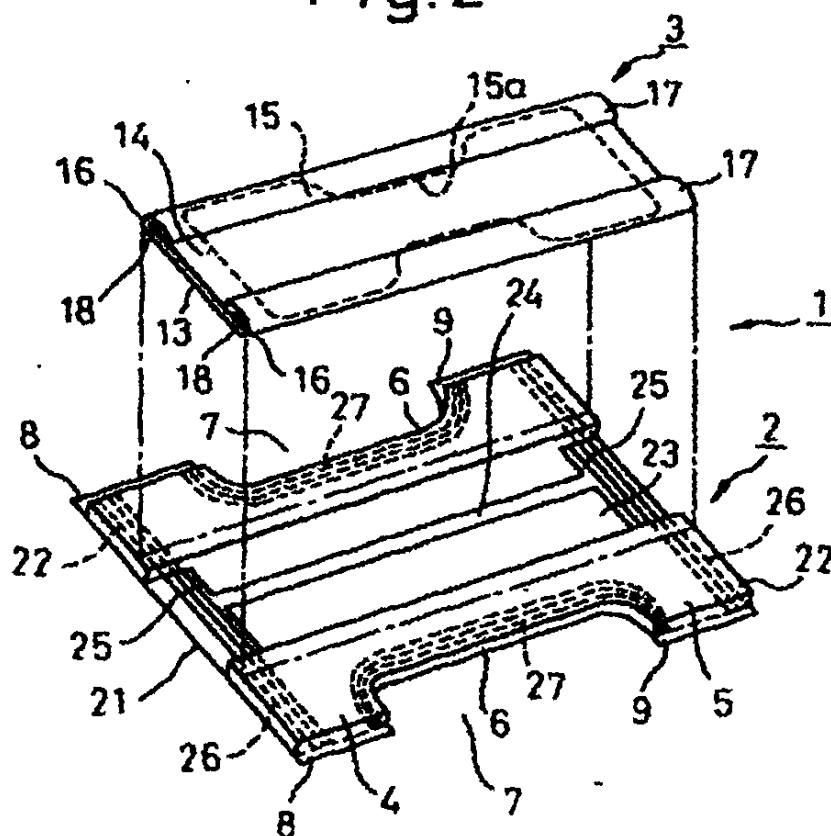


Fig. 2-



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Fig. 3

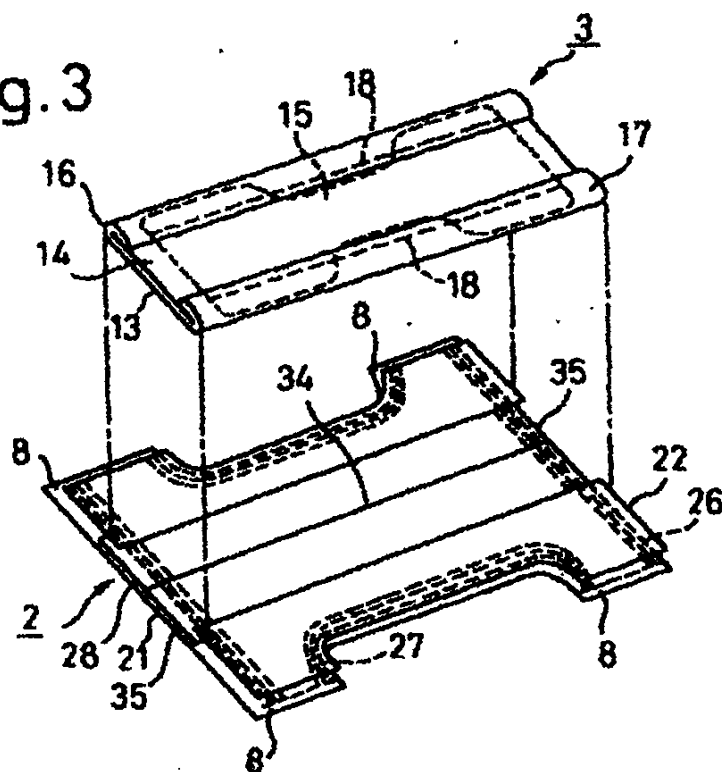
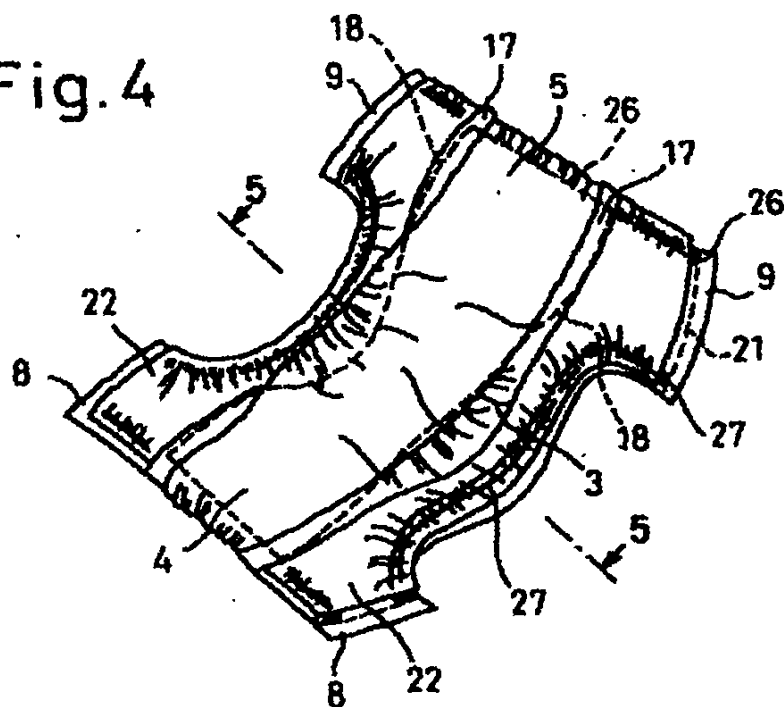


Fig. 4



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Fig. 7

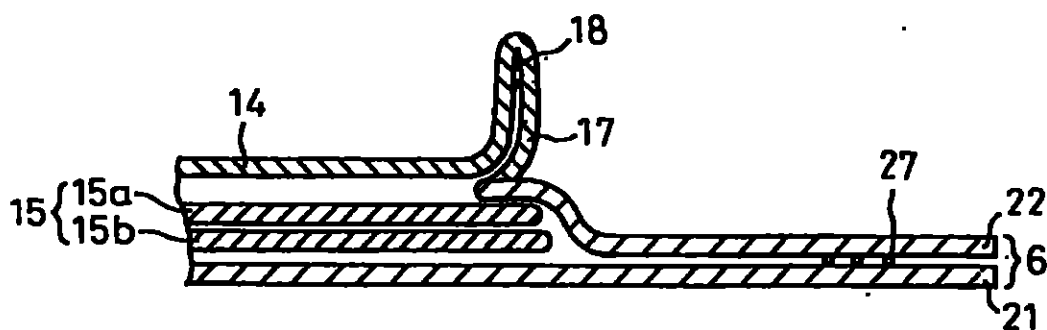
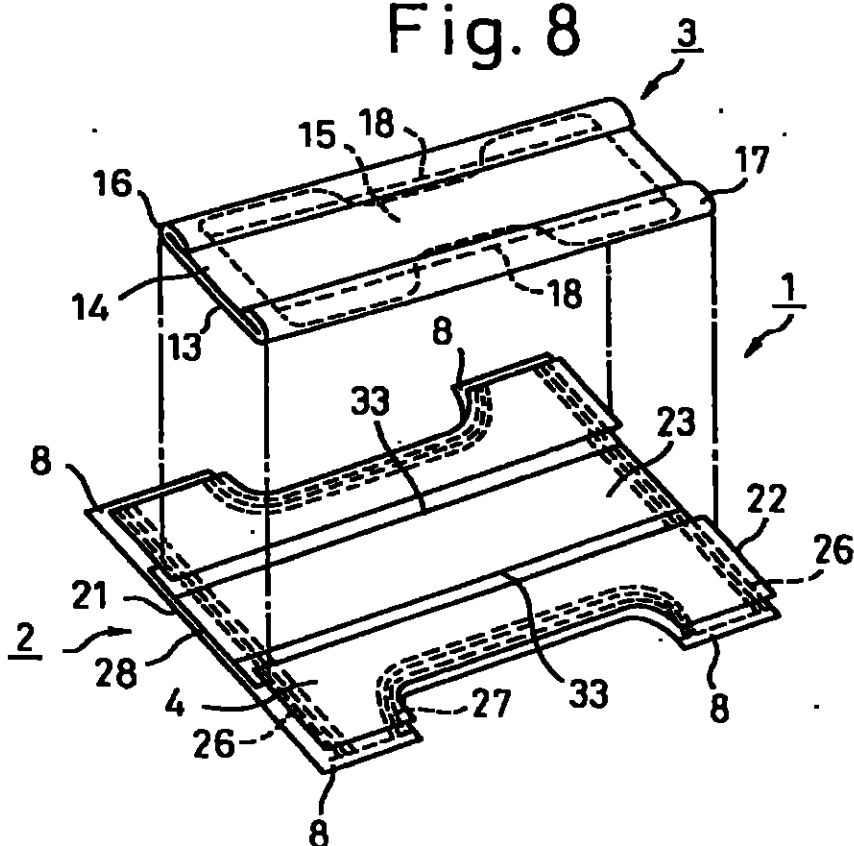


Fig. 8



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Fig. 9

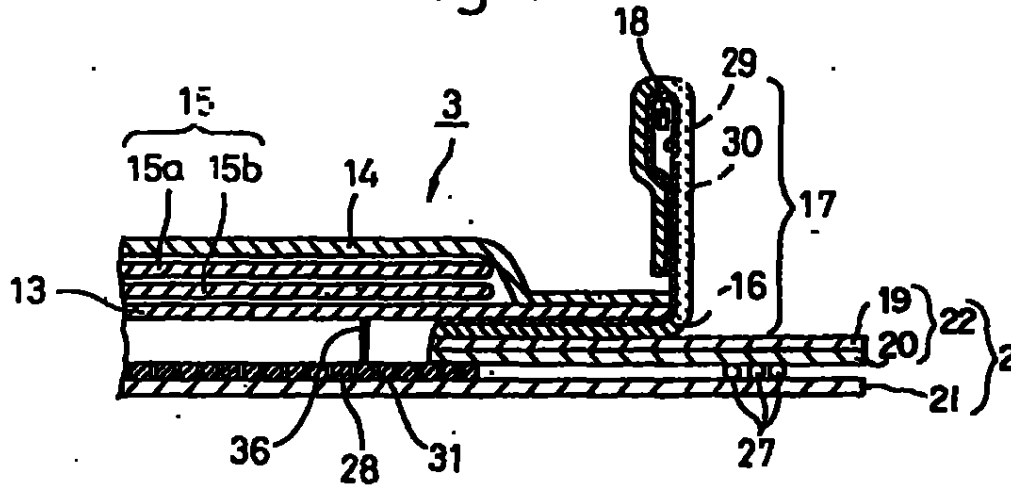
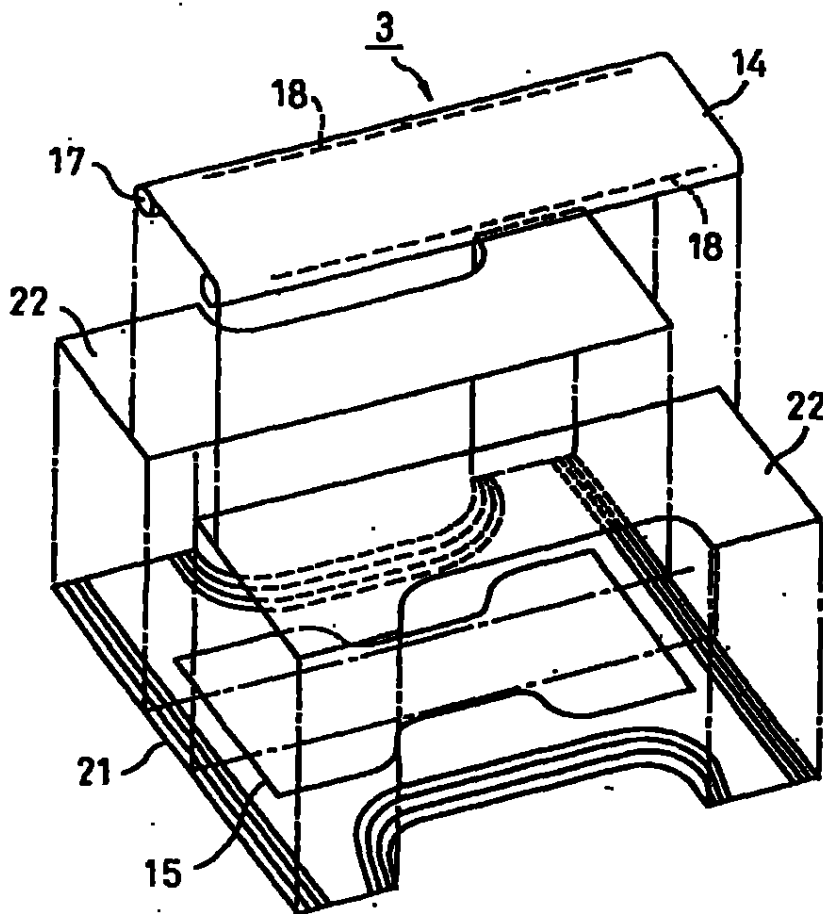


Fig. 10



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Fig.11

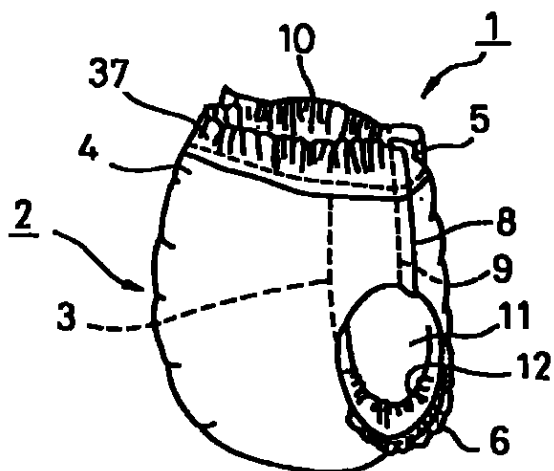
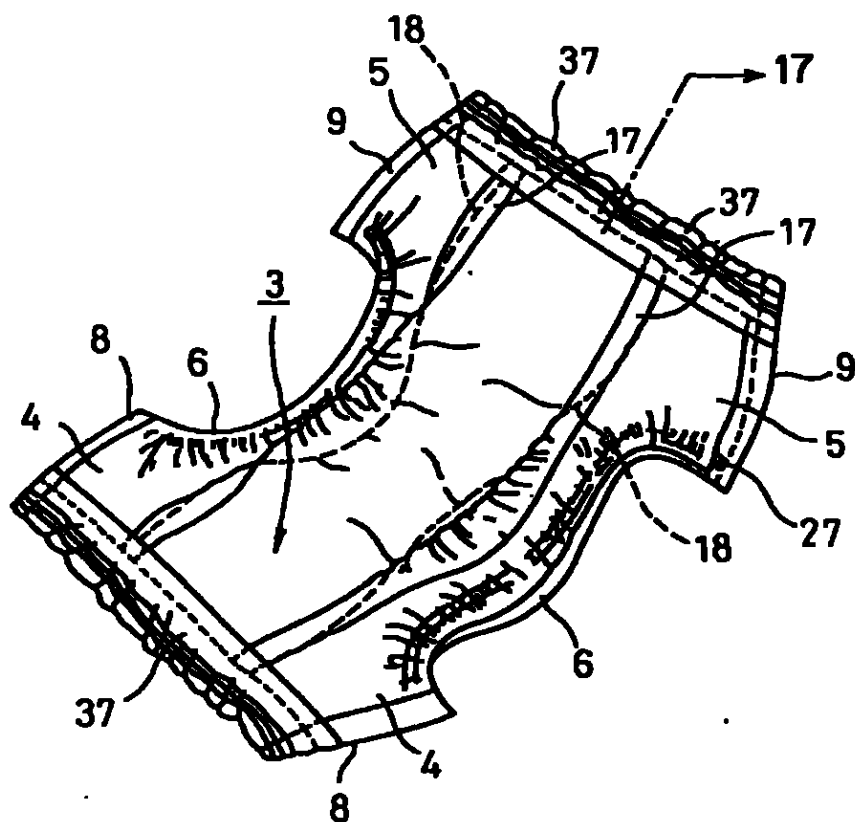
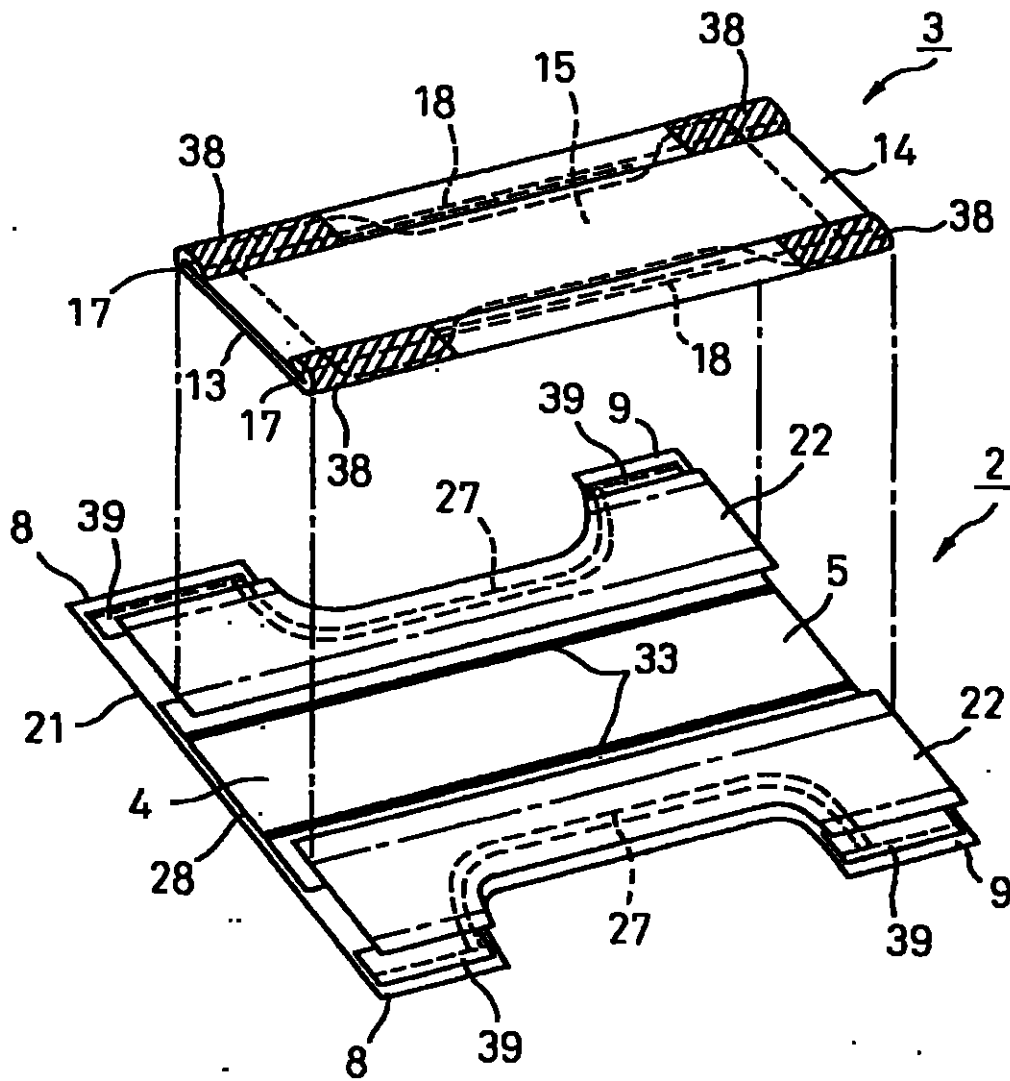


Fig.12



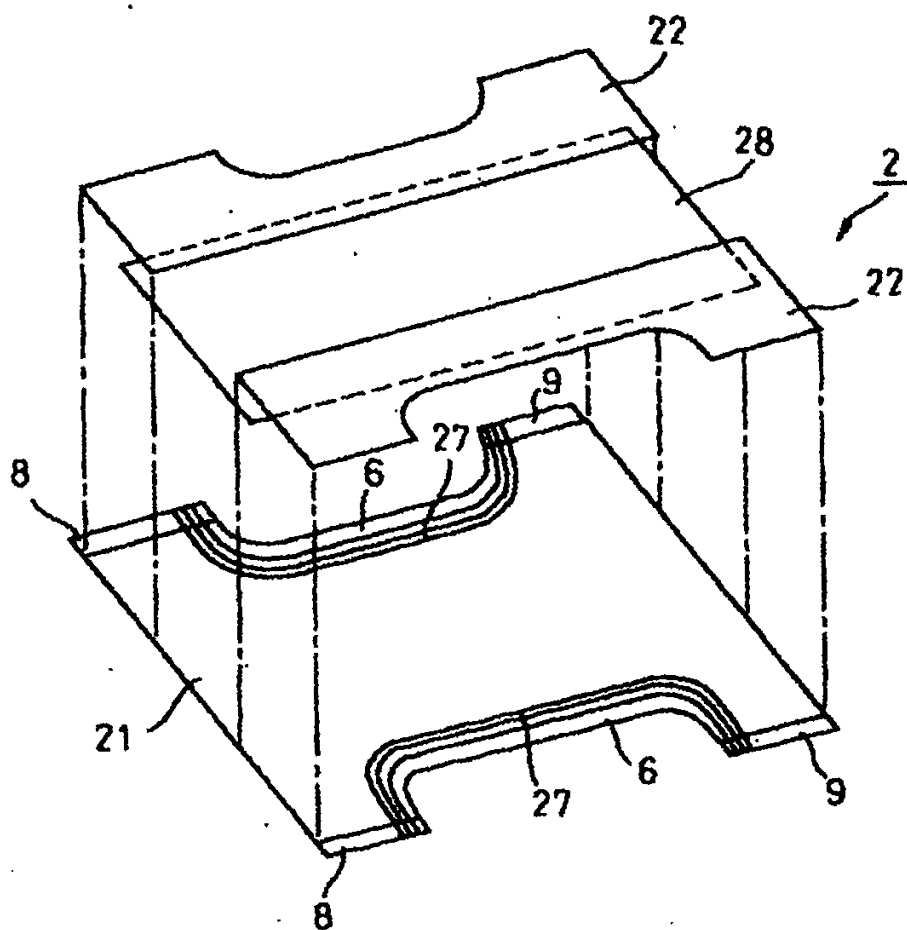
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Fig. 13



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Fig.14



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Fig.15

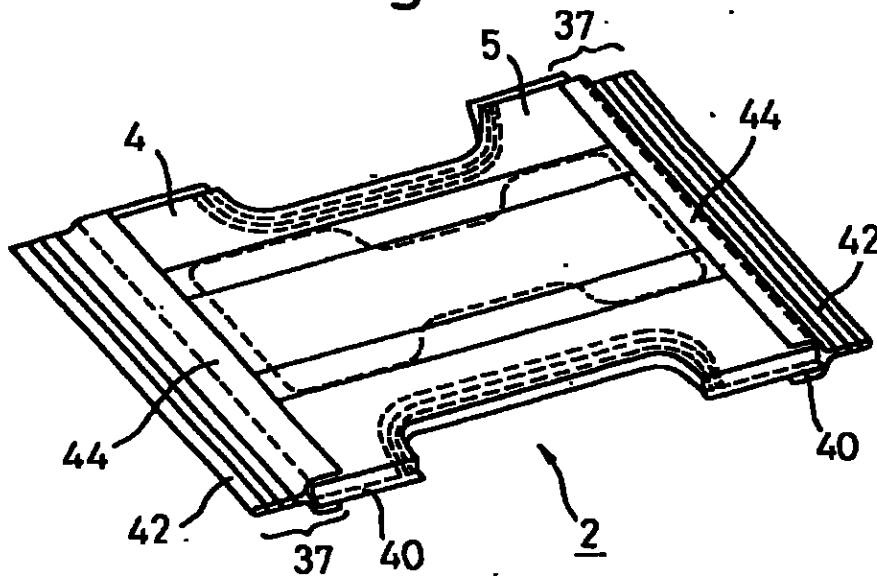


Fig.16

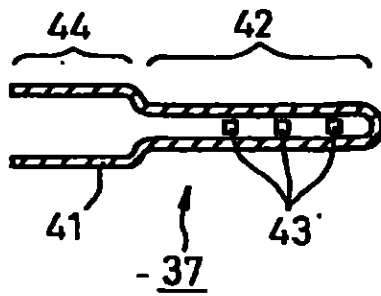
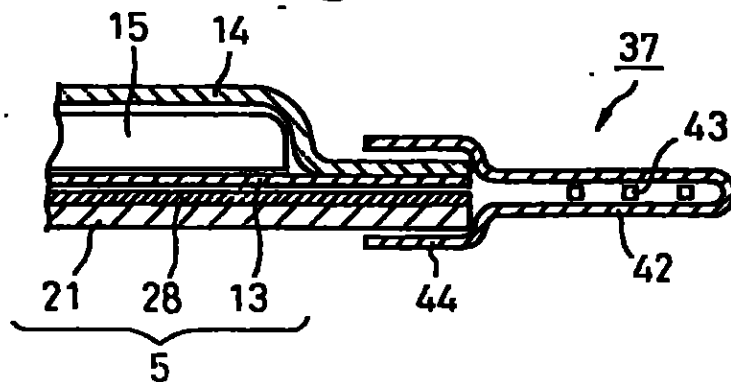


Fig.17



of the diaper and (b) a pair of side liner sheet layers covering both the side portions of the outermost sheet layer and extending along the longitudinal direction of the diaper, and

the liquid absorbent member (B) comprises (c) a liquid non-permeable back sheet layer located on the middle portion of the outermost sheet layer (A), (d) a liquid permeable top sheet layer superposed on the liquid non-permeable back sheet layer (c), and (e) a liquid absorbent pad layer interposed between the liquid non-permeable back sheet layer (c) and the liquid permeable top sheet layer (d).

Each of the side liner sheet layers (b) consisting of a composite sheet which comprises (i) an elastic sheet ply capable of expansion and contraction in the transverse direction of the diaper and (ii) at least one non-elastic sheet ply laminated on at least one surface of the elastic sheet ply (i) and capable of elongation in the transverse direction of the diaper.

In an embodiment of the diaper of the present invention, the composite sheet for the side liner sheet layer (b) exhibits an elastic stress of 300 g/25 mm or less under an elongation of 50% in a direction in which the elastic sheet layer is capable of expansion and contraction, and a recovery of 80% or more from expansion when the elastic stress is released.

In the composite sheet for the side liner sheet layer (b) of this embodiment, preferably, the elastic sheet ply (i) consists of an elastic, non-porous polyurethane resin film having a moisture-permeability of 2000 to 6000 g/m²·24 hr, and the non-elastic sheet ply (ii) consists of a nonwoven fabric.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an embodiment of the underpants type disposable diaper of the present invention.

FIG. 2 is an exploded perspective explanatory view of an embodiment of the underpants type disposable diaper of the present invention which has a liquid absorbent member and an outer member and is now opened and flattened.

FIG. 3 is an exploded perspective explanatory view of still another embodiment of the underpants type disposable diaper of the present invention now opened and flattened.

FIG. 4 is a perspective explanatory view of the opened underpants type disposable diaper of FIG. 3.

FIG. 5 is an explanatory transverse cross-sectional partial view of the underpants type disposable diaper of FIG. 4, along the line A-A' in FIG. 4.

FIG. 6 is an exploded perspective explanatory view of another embodiment of the underpants type disposable diaper of the present invention now opened and flattened.

FIG. 7 is an explanatory transverse cross-sectional partial view of the underpants type disposable diaper of FIG. 6.

FIG. 8 is an exploded perspective explanatory view of still another embodiment of the underpants type disposable diaper of the present invention now opened and flattened.

FIG. 9 is an explanatory transverse cross-sectional partial view of the underpants type disposable diaper of FIG. 8.

FIG. 10 is an exploded perspective explanatory view of still another embodiment of the underpants type disposable diaper of the present invention now opened and flattened.

FIG. 11 is a perspective view of still another embodiment of the underpants type disposable diaper of the present invention, which has elastic ribbon members attached to the front and back waist sections.

FIG. 12 is a perspective view of the underpants type disposable diaper of FIG. 11 now opened and flattened.

FIG. 13 is an exploded perspective explanatory view of the underpants type disposable diaper of FIG. 11 now opened and flattened.

FIG. 14 is an exploded perspective explanatory view of an outer member of underpants type disposable diaper of FIG. 11 now opened and flattened.

FIG. 15 is a perspective explanatory view of the underpants type disposable diaper of FIG. 11 having elastic ribbon members and now opened and flattened.

FIG. 16 is a cross-sectional explanatory view of the elastic ribbon member shown in FIG. 15 in a longitudinal direction of the diaper.

FIG. 17 is a cross-sectional explanatory view of the elastic ribbon member attached to a longitudinal end portion of the underpants type disposable diaper of FIG. 15, along a line A of FIG. 12.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the disposable diaper of the present invention is shown in FIG. 1.

In FIG. 1, an underpants type disposable diaper 1 comprises an outer member 2 and a liquid absorbent member 3 arranged on a middle portion of the inside surface of the outer member 2 and extending along the longitudinal direction of the diaper 1. The outer member 2 has a front waist section 4 and a back waist section 5 located at the front and back end portions of the outer member 2 and a pair of crotch sections 6 each having an inwardly indicated portion 7. When the side edge portions 8 of the front waist section 4 are joined, for example, by sewing, to side edge portion 9 of the back waist section 5, a waist opening 10 and a pair of crotch openings 11 are formed. The diaper 1 has a pair of flaps 12 extending from the inside surface of the diaper 1.

The front and back waist sections 4 and 5 and the crotch sections 6 are capable of expansion and contraction.

In the disposable diaper of the present invention, the outer member comprises an outermost sheet layer capable of elongation in the transverse direction of the diaper and a pair of side liner sheet layers covering both the side portions of the outermost sheet layer, extending along the longitudinal direction of the diaper. The pair of side liner sheet layers are separated and spaced from each other through the middle portion of the outermost sheet layer.

The liquid absorbent member comprises a liquid non-permeable back sheet layer located on the middle portion of the outer member, a liquid permeable top sheet layer superposed on the liquid non-permeable back sheet layer, and a liquid absorbent pad layer interposed between the liquid non-permeable bottom sheet layer and the liquid permeable top sheet layer.

FIG. 2 is an explanatory exploded view of the disposable diaper of the present invention, when the diaper is opened and flattened. In FIG. 2, the diaper 1 comprises an outer member 2 and a liquid absorbent member 3 which is indicated separately from the outer member 2.

The liquid absorbent member 3 comprises a liquid non-permeable back sheet layer 13, a liquid permeable top sheet layer 14 superposed on the back sheet layer 13 and a liquid absorbent pad 15 interposed between the back sheet layer 13 and the top sheet layer 14. The liquid absorbent pad 15 is in the shape of, for example, a dumbbell as shown by dotted lines 15a in FIG. 2, or in a rectangular form, and has a largest width and largest length which are respectively smaller than the width and length of the top sheet layer 14.

Thus, the liquid absorbent pad 15 does not extend to the outside of the top sheet layer 14.

At the side edges 16 of the liquid absorbent member 3, a pair of flaps 17 is formed from the side edge portions of the liquid non-permeable back sheet layer 13. The side edge portions of the back sheet layer 13 are folded to provide spaces for receiving elastic members 18 which are attached to the flaps 17 and make the flaps 17 capable of expansion and contraction.

When the flaps 17 contract, the flaps 17 rise at the side edge 16, and the liquid absorbent member 3 bends so as to form together with the flaps 17 a bag. In this bag, the flaps 17 serve as gathering side walls.

The elastic members 18 may be attached to the side edge portions of the back sheet layer 13, without folding the side edge portions. Each elastic member 18 may consist of one or two or more elastic threads or tapes.

In the liquid absorbent member, the top sheet layer is formed from a liquid permeable nonwoven fabric comprising a thermoplastic fibers, for example, polyethylene or polypropylene fibers.

Preferably, the nonwoven fabric for the top sheet layer has a thickness of 200 to 500 μm .

The back sheet layer is formed from a liquid non-permeable thermoplastic resin film, for example, polyethylene film or polypropylene film. The liquid non-permeable film is preferably moisture-permeable. Namely, the liquid non-permeable, moisture permeable film has a plurality of very fine holes which allow moisture to pass therethrough but not allow a liquid to pass therethrough. The liquid non-permeable, moisture permeable thermoplastic resin film can be produced by forming an undrawn thermoplastic resin film comprising a thermoplastic resin matrix and a plurality of fine solid filler particles and drawing the undrawn film in at least one direction. This liquid non-permeable, moisture permeable sheet layer effectively prevents the undesirable stiffness of the wearer of the diaper. The liquid non-permeable sheet layer preferably has a thickness of 20 to 40 μm .

The liquid absorbent pad preferably comprises fluff pulp fibers and a high water-absorbent polymeric material, for example, starch, copolymers of starch with grafted acrylic acid, and polyacrylates. The liquid absorbent pad may be formed from a high liquid absorbent paper sheet alone containing the high water absorbent polymeric material blended with the fluff pulp fibers and optionally heat-fusible synthetic fibers, or a laminate of two or more of the high liquid absorbent paper sheets. Also, the laminate may consist of a lower sheet layer formed from a blend or laminate of the fluff pulp fibers and the high water absorbent polymeric material, an upper sheet layer formed from the fluff pulp fibers, and a packing sheet by which the laminate of the upper and lower sheet layers is wrapped. As mentioned above, the liquid absorbent pad may be in a dumbbell or hourglass shape or a rectangular shape. Usually, the dumbbell shape liquid absorbent pad is preferred to improve the fit of the resultant diaper to the wearer.

The flaps of the liquid absorbent member are preferably formed from side edge portions of the liquid non-permeable sheet layers, extending from the side edges of the liquid absorbent member to the outside thereof. The flaps may be formed from a liquid non-permeable sheet other than that for the liquid non-permeable sheet layer.

The flaps may be formed from a laminate sheet consisting of a liquid non-permeable film having a smaller thickness of 5 to 20 μm and a higher surface than those of the liquid

non-permeable film for the back sheet layer and a nonwoven fabric made from synthetic hydrophobic fibers and having a basis weight of 10 to 25 g/m^2 .

In the laminate sheet for the flaps, the liquid non-permeable film may be laminated on the entire surface of the nonwoven fabric, or on a portion of the surface of the nonwoven fabric. Also, in the laminate sheet for the flaps, the side edges of the liquid non-permeable film may completely meet with the side edges of the nonwoven fabric laminated on the liquid non-permeable film, or the side edge portions of the nonwoven fabric may extend to the outside of the side edges of the liquid non-permeable film. The lamination of the liquid non-permeable film and the nonwoven fabric on each other can be carried out by a conventional laminating method, for example, an extrusion-laminating method, dry laminating method, two-pressure bonding method by a heat-embossing machine, a hot melt bond-laminating method or an ultrasonic bond-laminating method.

The elastic members for the flaps may comprise conventional elastic material for conventional disposable diaper, for example, a polyurethane film or tape, polyurethane thread, a polyurethane foam or rubber thread. The elastic member is adhered in an expanded (or stretched) condition thereof to the terminal portions of the flaps through a hot melt adhesive.

In FIG. 2, the outer member 2 comprises an outermost sheet layer 21 and a pair of side liner sheet layers 22 covering both side portions of the outermost sheet layer 21 and extending along the longitudinal direction of the diaper 1.

The outer member 2 (the outermost sheet layer 21 and the side liner sheet layers 22) has a pair of inwardly tapered portions 7 to form the crotch openings 11 when the front and back waist sections 4 and 5 of the outer member 2 are joined at the side edge portions thereof to each other.

The outermost sheet layer 21 is formed from a non-elastic sheet, for example, a nonwoven fabric comprising at least one member selected from, for example, polyester fibers, for example, polyethylene terephthalate fibers, polyamide fibers, for example, nylon 66 fibers, cellulose fibers, for example, cotton fibers or wood pulp fibers, and produced by, for example, water jet-entangling the fibers with each other. The nonwoven fabric may be hydrophilic or hydrophobic. The non woven fabric can be elongated under a stretching load, but cannot elastically contract when released from the stretching load.

The liquid absorbent member 3 is placed on the middle portion 23 of the outermost sheet layer 21 and adhered thereto, for example, at a central adhering region 24 extending in the longitudinal direction and a pair of terminal adhering regions 25 extending in the transverse direction of the middle portion 23.

The adhesion of the liquid absorbent member 3 to the middle portion 23 of the outermost sheet layer 21 by using a hot melt adhesive. The adhesive may be applied to the entire surface area of the middle portion 23 of the outermost sheet layer 21. However, to enhance the skin feeling of the resultant diaper for the wearer, it is preferred that the adhesive be applied to specific regions of the middle portion 23 of the outermost sheet layer 21. The adhering regions on the middle portion 23 may be in any form, for example, in the form of a straight line, a broken line, a plurality of dots, a curved line or a spiral line. Preferably, the adhering regions are located in the longitudinal center portion 24 and both the transverse terminal portions 25 of the middle portion 23 and

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invention now opened and flattened, in which diaper, the outermost sheet consists of the composite sheet.

The composite sheet for the outermost sheet consists of an elastic sheet ply capable of expansion and contraction in the transverse direction of the diaper and at least one non-elastic sheet ply laminated on at least one surface of the elastic sheet ply and capable of elongation in the transverse direction of the diaper. The elastic sheet ply is non-porous and liquid non-permeable, and serves as a liquid non-permeable back sheet layer of the liquid absorbent member.

The composite sheet for the outermost sheet layer preferably exhibits an elastic stress of 300 g/25 mm or less under an elongation of 50% in a direction in which the elastic sheet ply is capable of expansion and contraction and a recovery of 80% or more from expansion when the elastic stress is released.

In the composite sheet for the outermost sheet layer, the elastic sheet ply preferably consists of an elastic, non-porous (liquid non-permeable) polyurethane resin film having a moisture-permeability of 2000 to 6000 g/m²·24 hr, and the non-elastic sheet ply consists of a non-woven fabric.

The nonwoven fabric for the non-elastic sheet ply is preferably produced by forming a web from a plurality of fibers or filaments and spouting fluid streams against the web under high pressure so as to entangle the fibers or filaments with each other.

In the preparation of the composite sheet, the elastic sheet, for example, the elastic polyurethane film, is adhered to the non-elastic sheet, for example, the nonwoven fabric, through a hot melt adhesive while the elastic sheet is maintained in a non-expanded condition.

In FIGS. 6 and 7, a liquid absorbent pad layer 15 is directly arranged on a middle portion of an outermost sheet layer 21 and covered by a liquid permeable top sheet layer 14, to form a liquid absorbent member. A flap 17 is formed from the same liquid permeable sheet as that for the top sheet 14. A side liner sheet layer 22 is formed from a non-elastic nonwoven fabric capable of expansion in the transverse direction of the diaper. The inside edge portion of the side liner sheet layer 22 is inserted between the liquid absorbent pad layer 15 and the top sheet 14 so as to cover the outside edge portions of the liquid absorbent pads 15a and 15b. In the flap 17, an elastic member 18 is attached so as to elasticize the flap 17.

In the disposable diaper as shown in FIG. 8, an intermediate sheet layer 28 is placed on a middle portion 23 of an outermost sheet layer 21 and a pair of side liner sheet layers 22 are arranged on a pair of side portions of the outermost sheet layer 21 in such a manner that the inside edge portions of the side liner sheet layer 22 overlap with both the outside edge portions of the intermediate sheet layer 28, and these edge portions are adhered to each other.

A liquid absorbent member 3 is superposed on the intermediate sheet layer 28 and fixed thereto at a pair of adhering regions 33 by an adhesive.

The constitution of the disposable diaper shown in FIG. 9 is the same as that of FIG. 5, except that the liquid absorbent member 3 is adhered to the intermediate sheet layer 28 at an adhering region 36 located in the outside edge portion of the intermediate sheet layer 28.

The disposable diaper shown in FIG. 10 is the same as that of FIG. 6, except that in the liquid absorbent member 3, a pair of elastic members 18 is located in the middle portions of the flaps 17.

The disposable diaper shown in FIGS. 11 and 12 is the same as that of FIGS. 1, and 4, except that a pair of elastic

ribbon members 37 is attached to the outer end portions of the front and back waist sections 4 and 5 of the outer member 2, so as to extend outside of the front and back waist sections 4 and 5, in the longitudinal direction of the diaper and surround the waist opening 10 formed by joining the side edge portions of the front waist section 4 to the side edge portions of the back waist portion 5.

The disposable diaper shown in FIG. 13 is the same as that of FIG. 8, except that the liquid absorbent member 3 is composed of a liquid non-permeable back sheet layer 13, a liquid permeable top sheet layer 14, superposed on the back sheet layer 13, a liquid absorbent pad layer 15 interposed between the top and back sheet layer 13 and 14, a pair of flaps 17 extending from the side edges of the liquid absorbent member 3 and having elastic members 18 attached to the flaps 17, the side edge portions of the top sheet layer 14 and the back sheet layer 13 and the elastic members 18 are adhered and fixed to each other in the side edge adhering regions 38, by an adhesive (not shown in FIG. 13). When the elastic members 18 are released from elastic stress, it causes the flaps 17 to be elasticized and form gathers as shown in FIG. 12.

The flaps 17 may be formed from side edge portions of the back sheet layer 13 or the top sheet layer 14 or from another sheet material.

In the outer member 2 of FIG. 13, the outermost sheet layer 21 may have four sealing tape members 39 adhered to the side edge portions 8 and 9 of the front and back waist sections 4 and 5. The side edge portions 8 of the front waist section 4 can be joined to the side edge portions 9 of the back waist section 5 through the sealing tape members 39.

FIG. 14 shows an exploded perspective explanatory view of an embodiment of the outer member of the underpants type disposable diaper of FIG. 13.

In FIG. 14, the intermediate sheet layer 28 is placed on a middle portion of the outermost sheet layer 21 and a pair of side liner sheet layers 22 is placed on side portions of the outermost sheet layer 21, and inside edge portions of the side liner sheet layers 22 are overlapped on and adhered to the outside edge portions of the intermediate sheet layer 28. Between the outermost sheet layer 21 and side liner sheet layers 22 and in the inwardly indicated crotch sections 6, a pair of elastic members 27 are attached so as to elasticize the crotch sections 27.

In FIG. 15 showing a perspective explanatory view of another embodiment of the disposable diaper of the present invention having a pair of elastic ribbon members and now opened and flattened, a pair of elastic ribbon members 37 are attached to the outer end portions 40 of the outer member 2 so as to cover the outer end portions 40.

As shown in FIG. 16, the elastic ribbon member 37 is formed from a sheet 41 which is folded at a center portion thereof to form a waist flap 42 consisting of the folded two plies facing each other. In the waist flap 42, an elastic member 43 consisting of, for example, three elastic threads is contained between the facing two plies and fixed therein. In another end portion 44 of the elastic ribbon member 37, two end portions of the sheet 41 are free from each other and face each other. The facing end portion 44 forms a grasping belt portion of the elastic ribbon member 37.

In the grasping belt portion 44, an outer end portion 40 of the front or back waist section 4 or 5 is inserted between the two facing end portions of the folded sheet 41 and fixed thereto.

In FIG. 17, an outer end portion of the back waist section 5 is inserted into and fixed to the grasping belt portion 44 of the elastic ribbon member 37.

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When the wearer, particularly a child wears the underpants type diaper by himself, it is important that the diaper can be easily worn and taken off. Also, to enhance the appearance of the wearer and to prevent slipping down of the diaper, it is necessary that the diaper closely fit to the waist and hip of the wearer. For this purpose, the elastic ribbon members are attached to the outer end portions of the front and back waist sections, while maintaining both the elastic ribbon members and the outer end portions of the front and back waist sections under tensioned conditions in the transverse direction of the diaper. When the front and back waist sections are released from tension, the waist flap portions of the elastic ribbon members are elasticized so as to enhance the freedom of the front and back waist sections from expansion and contraction, and form gathers in the ribbon members. Also, the waist opening of the underpants type diaper can be easily enlarged and thus the diaper can be easily worn or taken off by the wearer.

Optionally, other elastic members are attached to the grasping belt portions of the elastic ribbon members, in addition to the elastic members attached to the waist flap portions thereof.

The elastic members for the waist flap portions and optionally for the grasping belt portions are fixed thereto by an adhesive, for example, a hot melt adhesive.

The sheet for the elastic ribbon members is preferably selected from nonwoven fabrics of thermoplastic fibers, for example, polyethylene fibers, polypropylene fibers and polyester fibers. To enhance the fit of the waist sections to the wearer, the nonwoven fabric preferably has a high bulkiness and softness. The waist flap portions of the elastic ribbon members preferably have a width of 5 to 50 mm, more preferably 20 to 30 mm. If the width is less than 5 mm, the elastic pressure of the waist sections may be applied locally to the wearer and a pressed mark is formed on the waist. If the width is more than 50 mm, sometimes, the appearance of the resultant diaper becomes unsatisfactory and the resultant elastic ribbon members are easily folded inwardly during wearing. Also, the grasping belt portions preferably have a width large enough to firmly adhere the grasping belt portions the waist sections, preferably 5 to 20 mm when they are adhered to each other by a hot melt adhesive.

In the disposable diaper of the present invention, it is preferable to fix the side edges of the front waist section to the side edge of the back waist section so as to form an underpants type diaper, by means of an adhesive or seam. However, the side edges of the front waist section may be repeatedly fastened and removed from the side edges of the back waist section by using fasteners.

In the disposable diaper of the present invention, since the side liner sheet layers are formed from a specific composite sheet, the resultant diaper has a satisfactory fit to the wearer, an excellent moisture permeability and a good touch feeling and can prevent an undesirable leaking of liquid and a stuffy feeling.

We claim:

1. A disposable diaper comprising:

- (A) an outer member having front and back waist sections located at the front and back end portions of the outer member and a pair of crotch sections each having an inwardly indented portion by which a crotch opening is formed when side edge portions of the front waist section are connected to side edge portions of the back waist sections, and comprising (a) an outermost sheet layer capable of elongation in a transverse direction of

the diaper and (b) a pair of side liner sheet layers covering both side portions of the outermost sheet layer and extending along a longitudinal direction of the diaper; and

- (B) a liquid absorbent member arranged on a middle portion of the outer member, extending along the longitudinal direction of the diaper, and comprising (c) a liquid non-permeable back sheet layer located on a middle portion of the outermost sheet layer (a), (d) a liquid permeable top sheet layer superposed on the liquid non-permeable back sheet layer (c), and (e) a liquid absorbent pad layer interposed between the liquid non-permeable back sheet layer (c) and the liquid permeable top sheet layer (d).

wherein

each of the side liner sheet layers (b) consists of a composite sheet which consists of (I) an elastic sheet ply capable of expansion and contraction in the transverse direction of the diaper and (II) at least one non-elastic sheet ply laminated on at least one surface of the elastic sheet ply (I) and capable of elongation in the transverse direction of the diaper.

the composite sheet for the side liner sheet layers (b) exhibits an elastic stress of 300 g/25 mm or less under an elongation of 50% in a direction in which the elastic sheet ply is capable of expansion and contraction, and a recovery of 80% or more from the elongation when the elastic stress is released,

the elastic sheet ply (I) of the composite sheet consists of an elastic, non-porous polyurethane resin film having a moisture-permeability of 2000 to 6000 g/m²·24 hr. and the non-elastic sheet ply (II) consists of a nonwoven fabric, and

a non-elastic intermediate sheet layer is interposed between a middle portion of the outermost sheet layer (a) and the liquid absorbent member (B) and connected to the side liner sheet layers (b).

2. The disposable diaper as claimed in claim 1, wherein the elastic sheet ply (I) of the composite sheet for the side liner sheet layers (b) is adhered to the non-elastic sheet ply (II) through a hot melt adhesive while the elastic sheet is maintained in a non-expanded condition.

3. The disposable diaper as claimed in claim 1, wherein the outermost sheet layer (a) consists of a composite sheet which consists of (I) an elastic sheet ply capable of expansion and contraction in the transverse direction of the diaper and (II) at least one non-elastic sheet ply laminated on at least one surface of the elastic sheet ply (I) and capable of elongation in the transverse direction of the diaper.

4. The disposable diaper as claimed in claim 3, wherein the composite sheet for the outermost sheet layer (a) exhibits an elastic stress of 300 g/25 mm or less under an elongation of 50% in a direction in which the elastic sheet ply (I) is capable of expansion and contraction, and a recovery of 80% or more from expansion when the elastic stress is released.

5. The disposable diaper as claimed in claim 3, wherein the elastic sheet ply (I) of the composite sheet for the outermost sheet layer (a), consists of an elastic, non-porous polyurethane resin film having a moisture-permeability of 2000 to 600 g/m²·24 hr. and the non-elastic sheet ply (II) consists of a nonwoven fabric.

6. The disposable diaper as claimed in claim 5, wherein the elastic sheet of the composite sheet for the outermost sheet layer (a), is adhered to the non-elastic sheet through a hot melt adhesive while the elastic sheet is maintained in a non-expanded condition.

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7. The disposable diaper as claimed in claim 1, wherein each of the front and back waist sections of the outer member (A) has an elastic member by which the front and back waist sections are elasticized.

8. The disposable diaper as claimed in claim 1, wherein each of the pair of crotch sections has an elastic member by which each crotch section is elasticized.

9. The disposable diaper as claimed in claim 1, wherein the front and back waist sections are connected in side edge portions thereof to each other.

10. The disposable diaper as claimed in claim 1, wherein a pair of liquid-non-permeable flaps are attached to both side edge portions of the liquid absorbent section and extend substantially along a longitudinal axis of the diaper.

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11. The disposable diaper as claimed in claim 1, wherein a pair of elastic ribbon members are attached to the outer end portions of the front and back waist sections of the outer member.

12. The disposable diaper as claimed in claim 11, wherein each elastic ribbon member comprises a waist flap portion having an elastic member by which the waist flap portion is elasticized, and a pair of grasping belt portions extending from the waist flap portion and facing each other, between which one of the outer end portions of the front and back waist sections is interposed and fixed.

* * * * *

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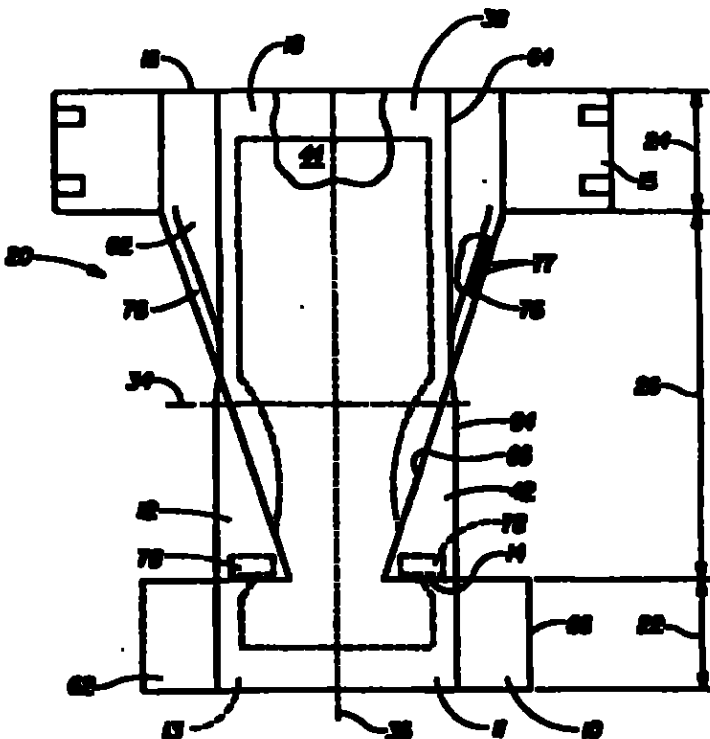
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(54) Title: **ABSORBENT ARTICLE HAVING INFLECTED BARRIER CUFFS AND METHOD FOR MAKING THE SAME**

(57) Abstract

Absorbent articles having side panels that provide inflected barrier cuffs which promote better containment and fit. The absorbent article has a front waist region, a rear waist region, a crotch region and a pair of longitudinal edges. The absorbent article further comprises a channel including a pair of longitudinally extending side panels, each of the side panels having a front ear flap section; a barrier cuff section having a first end edge located longitudinally inboard of the front ear flap section; a second end edge located in the rear waist region; a proximal edge and a distal edge; spacing means joined with each barrier cuff section; and closing means for securing at least a portion of the barrier cuff section juxtaposed the first end edge to the absorbent article inboard of the proximal edge. The distal edges are unsecured to any underlying structure of the absorbent article in the front and rear waist regions such that the distal edges form the longitudinal edges in the front and rear waist regions. The distal edge of the barrier cuff section is secured laterally inboard of the proximal edge in the crotch region such that the second end edges of the side panels located in the rear waist region are inverted relative to the first end edges to form an inflected barrier cuff that stands up in the crotch region when the absorbent article is fitted to a wearer.



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**ABSORBENT ARTICLE HAVING INFLECTED BARRIER CUFFS
AND METHOD FOR MAKING THE SAME**

FIELD OF THE INVENTION

The present invention relates to absorbent articles such as disposable diapers, incontinence briefs, undergarment absorbent inserts, feminine hygiene garments, and, more particularly, to absorbent articles having side panels that become inflected when the absorbent article is fitted to the wearer to provide barrier cuffs which improve the containment characteristics and fit of the absorbent article.

BACKGROUND OF THE INVENTION

The major function of absorbent articles such as disposable diapers and incontinence briefs or undergarments is to absorb and contain body exudates. Such articles are thus intended to prevent body exudates from soiling, wetting, or otherwise contaminating clothing or other articles, such as bedding, that come in contact with the wearer. The most common mode of failure for such products occurs when body exudates leak out of the gaps between the article and the wearer's leg or waist to adjacent clothing because they are not immediately absorbed within the article and the absorbent article is not able to sustain a good fit on the wearer such that gaps are created allowing the exudates to leak out of the absorbent article. For example, urine tends to be deposited onto the topsheet

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more rapidly than it can be absorbed and, therefore, the urine migrates to the gaps in the absorbent article where it can come in contact with clothing or other articles and can be absorbed by these articles. Additionally, loose fecal material that is not easily absorbed by the absorbent article tends to "float" on the liquid-receiving surface and work its way past the gaps in the article in the legs or waist of the wearer.

Contemporary disposable diapers have a topsheet, a backsheet, an absorbent core, and elasticized leg flaps generally formed from an elastic member being enclosed in the continuous topsheet and backsheet which extend beyond the edges of the absorbent core. These elasticized leg flaps prove effective generally to prevent wicking and overflow from the fluid laden diaper to clothing contacting the edges of the diaper in that the elasticized leg flaps present a fluid impervious barrier between the edge of the diaper and the contacting clothing, and in addition, provide a gasketing action about the legs of the wearer to maintain a seal about the leg and minimize gapping. However, leakage along the perimeter of the diaper may still occur. As the diaper is worn for longer periods of time, forces tend to act on the diaper to degrade the initial fit on the wearer. Large gaps and sagging of the diaper in the legs and waist are formed by the degradation in fit. Thus, as liquids are deposited onto the topsheet, some of the liquid is not immediately absorbed through the topsheet and migrates toward the edges of the diaper where it can leak through or past the gaps in the diaper and come in contact with clothing or undergarments where it can be absorbed by and wicked into such garments.

Disposable diapers may be provided with barrier cuffs which inhibit loose fecal material or gushes of urine or liquids from soiling the wearer's clothing. The barrier cuffs restrain the free flow of this material and provide a structure to hold such material within the diaper so that as such material freely floats or flows on the topsheet of the diaper, it is contained within the diaper. Despite the effectiveness of such structures in containing such material, it has been found that liquids can leak beyond the barrier cuffs and soil the wearer's clothing because the diaper construction does not promote a sustained fit of the diaper on the wearer. Additionally, the barrier cuffs may not be properly applied to the wearer such that good initial fit is not achieved and the sustained fit is often worse.

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Examples of some disposable diapers and absorbent articles described in the patent literature are:

U.S. Patent No. Re 26,151 which reissued Jan. 31, 1967 (originally U.S. Patent No. 3,180,335, dated Apr. 27, 1965) to Robert C. Duncan discloses a disposable diaper having inwardly folded side flaps and means to fasten the ends of the inwardly folded edges of the side flaps in position over the face of the absorbent pad of the diaper.

U.S. Patent No. 3,860,003 which issued to Kenneth Barclay Buell on Jan. 24, 1985 discloses contractible side portions for disposable diapers. Such diapers have outwardly extending side flaps and elastic members forming seals about the leg.

U.S. Patent No. 4,490,148 which issued Dec. 25, 1984 to Bo Beckstrom discloses an incontinence brief or diaper that has inwardly folded side flaps that are fixed at their ends to the backsheet, and which side flaps have elasticized free edges. The Beckstrom patent follows the Duncan teaching that the side flaps are not secured in the crotch area. Beckstrom positions the points of fastening at the ends of the side flaps behind the waistband edges of the absorbent core, and fastens them to underlying portions of the backsheet.

U.S. Patent No. 4,964,860 issued to Gipson et al. on October 23, 1990 discloses a detachable two piece absorbent article having a disposable element having inflected side panels (Fig. 2). The disposable element is temporarily secured to a refastenable belt which holds the disposable assembly against the waist of the wearer.

U.S. Patent No. 5,087,255 issued to Bret A. Sims on Feb. 11, 1992 discloses an absorbent article having an inflected barrier leg cuff which provides improved waist containment and fit. While this absorbent article has been effective, it is not economical to manufacture. The barrier leg cuff is manufactured independent of the absorbent core, backsheet and topsheet, and must be positioned and affixed to the topsheet as part of the manufacturing process.

Therefore, it is an object of the present invention to provide an absorbent

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article which has the improved containment characteristics of the inflected barrier cuff described in the Sims patent and the two piece garment of Glipson et al. but which is more convenient and efficient to manufacture and use.

It is an additional object of the present invention to provide an absorbent article having an inflected barrier cuff which acts as a restraint against the leakage of body exudates.

It is a still further object of the present invention to provide an absorbent article that is easy to apply to the wearer and promotes better containment by being less sensitive to variations in the application of the diaper and providing improved sustained fit.

These and other objects of the invention will be more readily apparent when considered in reference to the following description and when taken in connection with the accompanying drawings.

SUMMARY OF THE INVENTION

The present invention provides absorbent articles such as disposable diapers, incontinence briefs, diaper holders, training pants, feminine hygiene garments, and the like, having inflected barrier cuffs that improve the fit and containment characteristics of the absorbent article which are more convenient and economical to manufacture and use than products currently on the market. The absorbent article of the present invention preferably comprises a chassis having a front waist region; a rear waist region; a crotch region; a liquid pervious topsheet; a liquid impervious backsheet associated with the topsheet; an absorbent core positioned between the topsheet and the backsheet; and a pair of longitudinally extending side panels preferably formed from extensions of the topsheet, the backsheet, or both. The side panels each have a distal edge and a proximal edge, and extend longitudinally from the front waist region through the crotch region to the rear waist region. The side panels further comprise a spacing means disposed adjacent the distal edge of each side panel in the crotch region.

In one preferred embodiment, the side panels are folded inwardly and

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bonded to the topsheet in the crotch region, while the side panels are outwardly folded in at least the rear waist region. Thus, when fitted to the wearer, the side panels become inflected along their length. This transitions the side panels from their snug, gasketing fit about the buttocks of the wearer to their stand-up configuration in the "no motion zones" of the crotch region. The resulting "inflected barrier cuff" positioned in the no motion zones of the crotch region of the wearer provides improved fit and containment characteristics throughout the time of use. The side panels can also be extended laterally outwardly in the front waist region to form front ear flaps that provide for better containment and a wider range of wearer sizes.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as forming the present invention, it is believed that the invention will be better understood from the following descriptions which are taken in conjunction with the accompanying drawings in which like designations are used to designate substantially identical elements, and in which:

Figure 1 is a perspective view of a disposable diaper embodiment of the present invention having portions cut away to reveal underlying structure, the body-facing surface of the diaper facing the viewer;

Figure 2 is a fragmentary sectional view taken along section line 2-2 of Figure 1;

Figure 3 is a fragmentary sectional view taken along section line 3-3 of Figure 1;

Figure 4 is a fragmentary sectional view of an absorbent article in accordance with an alternative embodiment of the invention;

Figure 5a is a fragmentary sectional view of an alternative embodiment of the invention;

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Figure 5b is a fragmentary sectional view of another alternative embodiment of the invention;

Figure 6 is a fragmentary sectional view of another alternative embodiment of the invention;

Figure 7 is a perspective view illustrating another absorbent article in accordance with the present invention in which the side panels are inflected in the crotch region of the garment, the body-facing surface of the diaper facing the viewer;

Figure 8 is a perspective view of another disposable diaper embodiment of the present invention having ear flaps in the rear waist region, the body-facing surface of the diaper facing the viewer;

Figure 9 is a perspective view of the garment of Figure 1 with the side panels folded inward for packaging;

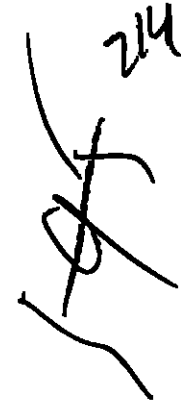
Figure 10a is a perspective view of an alternative embodiment of the present invention having a belt;

Figure 10b is a perspective view of an alternative embodiment of the present invention having a reusable belt;

Figure 11 is a perspective view of an alternative embodiment of the present invention having an attachment system in the front and rear waist regions, the garment-facing surface of the diaper facing the viewer;

Figure 12a is a perspective view of an alternative embodiment of the present invention wherein the side panels are separated between the front waist region and the crotch region, the body-facing side of the diaper faces the viewer; and

Figure 12b is a perspective view of an alternative embodiment of the diaper shown in Figure 12a wherein the separation in the side panels between the front waist region and the rear waist region is curvilinear, the body-facing side of the diaper faces the viewer.

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DETAILED DESCRIPTION OF THE INVENTION

As used herein, the term "absorbent article" refers to articles which absorb and contain body exudates and more specifically refers to articles which are placed against or in proximity to the body of the wearer to absorb and contain the various exudates discharged from the body. Absorbent articles are typically differentiated by whether they are reusable or disposable. "Disposable" refers to articles which are intended to be discarded after a single use (i.e., they are not intended to be laundered or otherwise restored or reused). The absorbent articles of the present invention are preferably disposable absorbent articles. The absorbent articles may be further defined by whether they are "unitary" such that they do not require separate manipulative parts or whether they comprise an element of a diaper system such as a separate holder and liner. The absorbent articles of the present invention are preferably unitary. A preferred embodiment of a unitary disposable absorbent article of the present invention, diaper 20, is shown in Figure 1. As used herein, the term "diaper" refers to a garment generally worn by infants and incontinent persons about the lower torso of the wearer. It should be understood, however, that the present invention is also applicable to other disposable absorbent articles such as incontinence briefs, undergarment absorbent inserts, disposable training pants, belted diapers, diaper holders, sanitary napkins, and the like.

Figure 1 is a plan view of one preferred embodiment of diaper 20 of the present invention in its flat-out, uncontracted state (i.e., with all elastic induced contraction pulled out) with portions of the structure being cut-away to more clearly show the construction of the diaper 20 and with the portion of the diaper 20 which contacts the wearer facing the viewer. The diaper 20 is shown in Figure 1 to have a body-facing surface 40 (facing the viewer in Figure 1), a garment-facing surface 41 opposed to the body-facing surface 40, a front waist region 22, a rear waist region 24, a crotch region 26, and a periphery which is defined by the outer edges of the diaper 20 in which the longitudinal edges are designated 30 and the end edges are designated 32. The waist regions generally comprise those portions of the diaper 20 which, when worn, encircle the waist of the wearer. The waist regions may include an elastic element such that they gather about the waist of the wearer. The crotch region 26 is that portion of the diaper 20

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positioned between the front waist region 22 and the rear waist region 24, and comprises that portion which, when worn, is positioned between the legs of the wearer and covers the lower torso of the wearer. The diaper 20 also has a lateral centerline which is designated 34 and a longitudinal centerline which is designated 36.

The diaper 20 comprises a liquid pervious topsheet 38; a liquid impervious backsheet 42 having an inner surface 23 (shown in Figures 2-4) and an outer surface 28 opposed to the inner surface 23; an absorbent core 44 having side edges that are designated side edges 50 and waist edges 52; side panels 62 each having a proximal edge 64, a distal edge 66, a first end 72, and a second end 74; spacing means 76 such as elastic members 77 for spacing the distal edge 66 away from the body-facing surface 40; and closing means 78 for securing at least a portion of the side panel 62 inboard of the proximal edge 64 in the front waist region 22.

In a preferred embodiment of the diaper 20 in which the backsheet 42 has length and width dimensions generally larger than those of the absorbent core 44, the backsheet 42 extends beyond the edges of the absorbent core 44 to thereby form the periphery of the diaper 20 and the side panels 62. The periphery defines the outer perimeter or, in other words, the edges of the diaper 20. The periphery comprises the longitudinal edges 30 and the end edges 32. As shown in Figures 1 and 2, the topsheet 38 may be coterminous with the backsheet 42 along the end edges 32 as well as the longitudinal edges 30 of the diaper 20.

Preferably, the proximal edge 64 of the side panel 62 defines the longitudinal edge 30 of the diaper 20 in the front waist region 22, and preferably comprises an extension of the topsheet 38 or the backsheet 42, or both. The distal edge 66 of each side panel 62 defines the longitudinal edge 30 of the diaper 20 in the rear waist region 24. The distal edge 66 is preferably not secured to any underlying elements of the diaper 20 in the crotch region 26 or the rear waist region 24. However, the distal edge 66 is preferably secured to the underlying structure (topsheet 38) of the diaper 20 laterally inboard of the proximal edge 64 in the front waist region 22 by the closing means 78, which preferably comprises an adhesive. (As used herein, the term "laterally inboard" is defined as the

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direction toward the longitudinal centerline 36 of the diaper 20.) Therefore, the distal edge 66 is closed in the front waist region 22 (i.e., it is not open nor capable of being spaced away from the body-facing surface 40).

Figure 2 is a fragmentary sectional view taken along line 2-2 of Figure 1 and depicts one preferred construction of the side panel 62 showing the topsheet 38, the backsheet 42, the absorbent core 44, and the elastic members 77. The absorbent core 44 is disposed between the topsheet 38 and the backsheet 42; the topsheet 38 and the backsheet 42 extending beyond the side edge 50 of the absorbent core 44 to form the side panel 62. In the embodiment shown, the topsheet 38 is secured to the backsheet 42 along the distal edge 66 by a bead of adhesive 35. Preferably, a layer of adhesive 37 is used to secure the absorbent core 44 to the backsheet as described later. The spacing means 76, such as a plurality of elastic members 77, is joined adjacent the distal edge 66 of each side panel 62. Preferably, an elastic attachment means 86 joins the elastic members 77 to the diaper 20. The distal edge 66 is thus spaced away from the body-facing surface 40 of the topsheet 38 by the elastic gathering action of the elastic members 77; a channel 88 being thereby formed between the proximal edge 64 and the distal edge 66.

Figure 3 is a fragmentary sectional view taken along line 3-3 of Figure 1 and depicts one preferred construction of the side panels 62 in the front waist region 22. The topsheet 38 and the backsheet 42 extend beyond the side edge 50 of the absorbent core 44 to form the side panels 62. As shown in Fig. 3, the topsheet 38 is folded upon itself and secured by the first closing means 78. In the embodiment shown, the outer surface 28 of the backsheet 42 is adjacent the skin of the wearer when the garment is donned. Therefore, it is desirable to adopt designs in which the outer surface 28 is formed from or is covered with cloth or a cloth-like substitute such that a skin-friendly surface is provided against the wearer's skin.

The absorbent core 44 may be any absorbent material which is generally compressible, conformable, non-irritating to the wearer's skin, and capable of absorbing and retaining liquids and certain body exudates. The absorbent core 44 may be manufactured in a wide variety of sizes and shapes (e.g., rectangular,

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hourglass, asymmetric, etc.) and from a wide variety of liquid absorbent materials commonly used in disposable diapers and other absorbent articles, such as comminuted wood pulp which is generally referred to as airfelt. Examples of other suitable absorbent materials include creped cellulose wadding, absorbent foams, absorbent sponges, superabsorbent polymers, absorbent gelling materials, or any equivalent materials or combination of materials. The total absorbent capacity of the absorbent core 44 should, however, be compatible with the design exudate loading and the intended use of the diaper 20. Further, the absorbent capacity and configuration of the absorbent core 44 may be varied to accommodate wearers ranging from infants through adults (e.g., the absorbent core may have a varying caliper, or a hydrophilic gradient, a capillary differential, low density zones, or may or may not contain absorbent gelling materials).

The absorbent core 44 may comprise a layer of absorbent material comprising hydrophilic fibers and particles of absorbent gelling material (hydrogel) such as the absorbent structure described in U.S. Patent 4,610,678 entitled "High-Density Absorbent Structure" which issued to Paul T. Wiseman and Steven A. Goldman on September 9, 1986 and which patent is incorporated herein by reference. Preferred embodiments of the absorbent core 44 are generally described in U.S. Patent No. 5,234,423 entitled "Absorbent Article With Elastic Waist Feature and Enhanced Absorbency", issued to Alman et al. on August 10, 1993; and U.S. Patent No. 5,217,445 entitled "Absorbent Structures Containing Superabsorbent Material and Web of Wetlaid Stiffened Fibers" issued to Young et al. on June 8, 1993, which are incorporated herein by reference. Other exemplary absorbent cores useful in the present invention are described in U.S. Patent No. 5,124,188 entitled "Porous, Absorbent, Polymeric Macrostructures and Methods of Making the Same", issued to Roe et al., on June 23, 1992; U.S. Patent No. 5,137,537 entitled "Absorbent Structure Containing Individualized, Polycarboxylic Acid Crosslinked Wood Pulp Cellulose Fibers", issued to Herron et al., on August 11, 1992; U.S. Patent No. 5,180,622 entitled "Absorbent Members Containing Interparticle Crosslinked Aggregates", issued to Berg, et al., on January 19, 1993; U.S. Patent 5,260,345 entitled "Absorbent Foam Materials for Aqueous Body Fluids and Absorbent Articles Containing Such Materials" issued to DesMarnis et al., on November 9, 1993; U.S. Patent

4,673,402 entitled "Absorbent Article With Dual-Layered Cores" which issued to Paul T. Weisman, Dawn L. Houghton and Dale A. Gellert on June 16; and PCT Publication No. WO 92/11830, published on July 23, 1992, entitled "Absorbent Article Having Rapid Acquiring, Multiple Layer Absorbent Core". All of these patents and patent applications are incorporated herein by reference.

The backsheet 42 is positioned adjacent the absorbent core 44 adjacent the surface that faces away from the wearer and is preferably secured thereto by core attachment means 37 such as those well known in the art. For example, the backsheet 42 may be secured to the absorbent core 44 by a uniform continuous layer of adhesive, a patterned layer of adhesive, or an array of separate lines or spots of adhesive. A adhesive which has been found to be satisfactory is manufactured by H.B. Fuller Company of St. Paul Minn. and marketed as HL-1258. The core attachment means preferably comprise an open pattern network of filaments of adhesive as is shown in U.S. Patent 4,573,986 entitled "Disposable Waste-Containment Garment" which issued to J. A. Minetola and David R. Tucker on March 4, 1986, and which is incorporated herein by reference. An exemplary attachment means of an open pattern network of filaments comprises several lines of adhesive filaments swirled into a pattern such as is illustrated by the apparatus and methods shown in U.S. Patent No. 3,911,173 issued to Sprague, Jr. on Oct. 7, 1975; U.S. Patent No. 4,785,996 issued to Zieckler, et al. on Nov. 22, 1978; and U.S. Patent No. 4,842,666 issued to Werenicz on June 27, 1989. Each of these patents are incorporated herein by reference. Alternatively, the attachment means may comprise heat bonds, pressure bonds, ultrasonic bonds, dynamic mechanical bonds, or any other suitable attachment means or combinations of these attachment means as are known in the art.

The backsheet 42 is impervious to liquids and is preferably manufactured from a thin plastic film, although other flexible liquid impervious materials may also be used. The backsheet 42 prevents the exudates absorbed and contained in the absorbent core 44 from wetting articles which contact the diaper 20 such as bedsheets and undergarments. Further, the backsheet 42 may permit vapors to escape from the absorbent core 44 while still preventing exudates from passing through the backsheet 42. The backsheet 42 may thus comprise a woven or nonwoven material, polymeric films such as thermoplastic films of, for example,

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polyethylene or polypropylene, or composite materials such as film-coated nonwoven materials. Alternatively, the backsheet 42 may comprise a laminate of a nonwoven layer and a polymeric film, including embodiments wherein the nonwoven layer extends beyond the dimensions of the polymeric film. An exemplary backsheet 42 is a polyethylene film having a thickness of from about 0.012 mm (0.5 mil) to about 0.051 cm (2.0 mils). As used herein, the term "flexible" refers to materials which are compliant and which will readily conform to the general shape and contours of the human body. A suitable polyethylene film is manufactured by Tredegar Film Products, Inc. of Terre Haute, IN, and is marketed in the trade as Tredegar X8526. The backsheet 42 is preferably embossed and/or matte finished to provide a more cloth like appearance.

The topsheet 38 is compliant, soft feeling, and non-irritating to the wearer's skin. Further, the topsheet 38 is liquid pervious permitting liquids to readily penetrate through its thickness. A suitable topsheet may be manufactured from a wide range of materials, such as porous foams, reticulated foams, formed films, apertured plastic films, natural fibers (e.g., wood or cotton fibers), synthetic fibers (e.g., polyester or polypropylene fibers) or from a combination of natural and synthetic fibers. There are a number of manufacturing techniques which may be used to manufacture the topsheet 38. For example, the topsheet 38 may be woven, non-woven, spunbonded, carded, or the like. One preferred topsheet 38 comprises staple length polypropylene fibers having a denier of about 2.2, such as P-8, manufactured by Veratex, Inc., a Division of the International Paper Company, of Walpole, Massachusetts. As used herein, the term "staple length fibers" refers to those fibers having a length of at least about 15.9 mm (0.625 inches). A preferred topsheet 38 is carded, and thermally bonded by means well known to those skilled in the fabrics art.

In a preferred embodiment, the topsheet 38 is made of a hydrophobic material to isolate the wearer's skin from liquids in the absorbent core 44. If the topsheet 38 is made of a hydrophobic material, at least the upper surface of the topsheet 38 is treated to be hydrophilic so that liquids will transfer through the topsheet 38 more rapidly. This diminishes the likelihood that body exudates will flow off the topsheet 38 rather than being drawn through the topsheet 38 and being absorbed by the absorbent core 44. The topsheet 38 can be rendered

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hydrophilic by treating it with a surfactant including spraying the topsheet 38 material with a surfactant or immersing the material into the surfactant. A more detailed discussion of such a treatment is contained in U.S. Patents 4,988,344 entitled "Absorbent Articles with Multiple Layer Absorbent Layers" issued to Reising et al., on January 29, 1991, and U.S. Patent 4,988,345 entitled "Absorbent Articles with Rapid Acquiring Absorbent Cores" issued to Reising on January 29, 1991, each of which is incorporated herein by reference.

The topsheet 38 and the backsheet 42 may be joined together in any suitable manner as is well known in the diaper manufacturing art. As used herein, the term "joined" encompasses configurations whereby the topsheet 38 is directly joined to the backsheet 42 by affixing the topsheet 38 directly to the backsheet 42, and configurations whereby the topsheet 38 is indirectly joined to the backsheet 42 by affixing the topsheet 38 to intermediate members which in turn are affixed to the backsheet 42. In a preferred embodiment, the topsheet 38 and the backsheet 42 are joined directly to each other in the diaper periphery by attachment means 35 such as an adhesive or any other attachment means as is known in the art. Suitable attachment means are discussed previously with regard to the backsheet 42.

The diaper 20 further comprises a pair of side panels 62 that provide a structure to restrain the free flow of body exudates along the body-facing surface 40 of the diaper 20, and to hold and contain such exudates within the diaper 20. In a preferred embodiment, the side panels 62 are liquid impermeable. Thus, in the front waist region 22, where the side panels 62 are folded over the body-facing surface 48 of the absorbent core 44, the side panels 62 prevent liquid deposited on the topsheet 38 from migrating beyond the absorbent core 44. This helps ensure that any liquids not immediately absorbed by the absorbent core 44 will be absorbed before they migrate to areas from which the liquids can leak out of the diaper 20. In the crotch region 26, the side panels 62 stand-up in the "no motion" zones of the wearer and provide a liquid impermeable barrier cuff that conforms to the wearer's body providing containment of body exudates well beyond when the diaper 20 has been loaded. In the rear waist region 24, the side panels 62 provide a gasketing action about the buttocks of the wearer that helps prevent gapping that can lead to leaks.

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Each side panel 62 is a flexible member having a proximal edge 64 and a distal edge 66. The distal edge 66 of the side panel 62 is that part of the side panel 62 that is spaced laterally outwardly from the absorbent core 44 when the side panel 62 is in a flat-out state (before the side panel 62 is folded and joined to the topsheet 38 in the front waist region 22). The distal edge 66 of each side panel 62 is preferably not secured to any underlying elements of the diaper 20 in at least the rear waist region 24, preferably in both the rear waist region 24 and the crotch region 26. The distal edge 66 is preferably spaced away from the body-facing surface 40 in the crotch region 26 so that the side panel 62 may form a channel 88 (as shown in Fig. 2) to enhance the containment of the diaper 20. As used herein, "spaced" includes embodiments wherein the distal edges 66 may assume one or more positions relative to the body-facing surface 40 including at some times assuming a position adjacent the body-facing surface 40. In a preferred embodiment, as shown in Figure 1, the distal edge 66 of each side panel 62 is disposed laterally inboard of the proximal edge 64 in the front waist region 22 so as to present a more effective barrier against the flow of exudates. The distal edges 66 are maintained inboard of the proximal edges 64 in the front waist region 22 by the first closing means 78 so as to obviate their inversion.

The proximal edge 64 is that portion of the side panel 62 that is disposed adjacent the side edges 50 of the absorbent core 44. (When the side panels 62 are in a flat-out configuration, the proximal edge 64 is spaced laterally inboard from the distal edge 66.) The distal edge 66 is spaced apart from the proximal edge 64 and their spatial relationship to each other defines the effective width of each of the side panels 62. The proximal edges 64 and the distal edges 66 may be in a parallel, nonparallel, rectilinear or curvilinear relationship. In addition, each of the side panels 62 may have a variety of different cross-sectional areas including circular, square, rectangular or any other shape. Preferably, the proximal edge 64 is spaced from the distal edge 66 in a parallel and rectilinear relationship. The effective width of the side panel 62 is an important parameter in reducing leakage of body exudates out of the diaper 20. If the effective width of the side panel is too small, then gaps will be formed between the leg of the wearer and the distal edge 66 such that liquids may flow over the distal edge 66 to the periphery of the diaper 20.

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As shown in Figure 1, the distal edges 66 are preferably laterally spaced apart from each other in the front waist region 22. However, the lateral spacing between the distal edges 66 can range from being crossed over each other to abutting each other to being laterally spaced apart up to the width of the proximal edges in the front waist region 22. Thus, in a preferred embodiment as shown in Figure 1, the distal edges 66 may be laterally spaced apart from about -25 mm (-1 inch) (overlapping edges) up to about 150 mm (6 inches). Preferably, the distal edges 66 are spaced apart so that the side panel will fit in the innermost leg crease of the wearer rather than ride along the wearer's outer thigh.

The distal edges 66 are also shown in Figure 1 to be disposed parallel to each other and perpendicular to the end edge 32 of the diaper 20 in the front waist region 22. While this is a preferred embodiment, the distal edges 66 may alternatively be angled toward or away from each other, preferably toward each other, such that the distal edges 66 are disposed non-perpendicular to the end edges 32. Angling the side panels 62 relative to the end edge 32 may assist in allowing the side panel 62 to remain spaced from the body-facing surface 40 in the crotch region 26 during use.

The distal edges 66 are preferably laterally spaced apart from each other in the crotch region 26. The lateral spacing of the distal edges 66 is especially important in the crotch region 26 to prevent body exudates, especially urine, from leaking out of the diaper 20 in the leg regions of the wearer. If the distal edges 66 are laterally spaced too far from each other, then the side panels 62 have an increased tendency to "flip out" in the crotch region 26 such that urine can flow over the side panels 62. If the distal edges 66 are spaced too close to each other, then the side panels 62 provide a reduced area for deposition of exudates such that exudates could be deposited directly onto the side panels 62 and flow to the edges of the diaper 20.

The distal edge 66 of each side panel 62 is preferably disposed laterally outboard of each proximal edge 64 in the rear waist region 24 of the diaper 20 when the diaper 20 is in a flat-out uncontracted condition. The term "outboard" is defined as the direction away from the longitudinal centerline 36 of the diaper 20. (i.e., the direction opposite from the direction defined by the term "inboard.")

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Thus, the side panel 62 extends laterally outwardly in the rear waist region 24 when the diaper 20 is in a flat-out uncontracted condition. The laterally extending portion of the side panel 62 promotes better containment that is less sensitive to application variations and provides a sustained contoured fit about the buttocks of the wearer.

Because the distal edge 66 is disposed inboard of the proximal edge 64 in the front waist region 22 and outboard of the proximal edge 64 in the rear waist region 24, the distal edge 66 becomes "inflected" along its length when the diaper 20 is fitted to a wearer. This inflection transitions the side panels 62 from snugly fitting about the buttocks (the laterally outwardly extending portion) to standing up in the "no motion" zone of the crotch region 26 for better containment. The resultant "inflected barrier cuff" is easier to apply to the wearer and ensures that the fit of the side panel 62 is in the "no motion" zone in the crotch region 26 with a snug fit about the wearer's buttocks in at least the rear waist region 24.

It has been found that the inflected barrier cuff thus provides both a gasketing action about the buttocks of the wearer to provide a sustained snug fit which reduces leakage of body exudates, especially runny BM, and a stand-up barrier cuff in the crotch region 26 and the front waist region 22 to constrain, contain and hold body exudates within the diaper along the channel 88. However, it has been found that if the side panel 62 is "flipped out" too far toward the front waist region 22 along the length of the side panel 62, then body exudates will tend to flow over the side panels 62. Thus, it is preferred that the inflected barrier cuffs, in use, provide a gasketing action about the buttocks of the wearer to provide a snug fit (i.e., the flipped out portion of the barrier cuffs is positioned) in less than about 50% of the length of the diaper, more preferably less than about 40% of the length of the diaper 20, and most preferably only in the rear waist region 24. (The percent length of the flipped out portion is defined as that length of the diaper in which the side panel is flipped out divided by the total length of the diaper times 100%.) Thus, the stand-up portion of the side panel (distal edge 66 disposed inboard of the proximal edge 64) is provided, in use, in at least about 50% of the length of the diaper, preferably at least about 60% of the length of the diaper, and most preferably from the front waist region 22 to and throughout the crotch region 26.

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The flipped out portion of the side panel 62 can be maintained in less than about 50% of the length of the diaper 20 in a number of different ways. For example, the closure means 78 can be extended in the longitudinal direction, thus ensuring that the flipped out portion is maintained in less than about 50% of the length of the diaper 20. Alternatively, as shown in Figure 7, a crotch attachment means 100 may be disposed in the crotch region 26 of the diaper 20 for securing the distal edge 66 inboard of the proximal edge 64.

The crotch attachment means 100 can comprise any attachment means as is known in the art, including those described below with respect to the closure means 78 that maintains the distal edges 66 inboard of the longitudinal edges 30 in the front waist region 22. Further, the bond provided by crotch attachment means 100 may be breakable such that the user may release all or a portion of the distal edge 66 in the crotch region 26 to obtain the desired fit.

The closing means 78 for securing the first end 72 of the side panels 62 closed is shown in Figure 1. The closing means 78 provides a more comfortable fit for the wearer and secure the distal edges 66 of the side panels 62 in the proper position to form an inflected barrier cuff. In a preferred embodiment as shown in Figure 1, the closing means 78 is disposed in the front waist region 22. The remaining portions of the distal edges 66 are preferably not secured to any underlying structure of the diaper 20 so that the distal edges 66 are left freely openable. In a preferred embodiment, the length of the closure means 78 is from about 25 mm (about 1 inch) to about 100 mm (about 4 inches), more preferably between about 35 mm (about 1.5 inches) and about 75 mm (about 3 inches). This construction is preferred so as to create a snug fit about the buttocks of the wearer to especially prevent leakage of loose fecal material.

While each of the closing means 78 may comprise any of several securement means as are known in the art such as ultrasonic bonds or heat/pressure bonds or seals using a variety of bonding patterns, or adhesives and/or glues, the closing means are preferably adhesive bonds consisting of adhesive such as manufactured by H.B. Fuller Company of St. Paul Minn. and marketed as HL-1258.

As shown in Figure 1, the spacing means 76 preferably comprise elastic

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members 77 that are operatively associated with each of the side panels 62 adjacent the distal edge 66. The elastic members 77 are preferably secured to the side panels 62 in an elastically contractible condition so that in a normally unrestrained configuration, the elastic members 77 effectively contract or gather the distal edge 66 of the side panels 62. The elastic members 77 can be secured to the side panels 62 in an elastically contractible condition in at least two ways as is discussed in U.S. Patent 3,860,003 entitled "Contractible Side Portion For Disposable Diaper", which issued to Kenneth B. Buell on January 26, 1974, which is incorporated by reference herein. In addition, the length of the elastic member 77 in general is dictated by the diaper design. In the embodiment illustrated in Figure 1, the elastic member 77 extends along essentially the entire length of the side panels 62 in the crotch region 26, although other lengths are cognizable. The elastic members 77 are preferably not disposed in the front waist region 22. The lack of gathering of the distal edge 66 adjacent the end edge 32 helps reduce the forces which tend to pull the diaper 20 downward, resulting in sagging and gapping of the diaper 20 in the waist regions.

As shown in Figure 2, the elastic member 77 is operatively associated with the side panels 62 by securing it to or within the side panels 62 with an elastic attachment means 86. The elastic attachment means 86 should be flexible and of sufficient adhesiveness to hold the elastic member 77 in its stretched condition. While the elastic members 77 may be secured to the side panels 62 adjacent only the ends of the elastic member 77, it is preferable to secure the entire length of the elastic member 77 to the side panels 62. (In one preferred embodiment of the present invention, wherein the absorbent article comprises ear flaps 54 (as shown in Fig. 8), the elastic members 77 may be joined to the ear flaps 54 in the rear waist region 24.) The elastic attachment means 86 herein are preferably glue beads made of hot melt adhesive such as marketed by Findley Adhesives Incorporated, Elmhurst, Wisconsin, as Findley Adhesives 581, although the elastic members 77 may be affixed to the side panels 62 in any of several other ways which are well known in the art. For example, the elastic members 77 may be ultrasonically bonded or heat/pressure sealed into the side panels 62 using a variety of bonding patterns, or the elastic members 77 may simply be glued to the side panels 62. A more detailed description of the manner in which the elastic members 77 may be positioned and secured to the side panels 62 can be found in

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U.S. Patent 4,081,301, entitled "Method and Apparatus for Continuously Attaching Discrete, Stretched Elastic Strands to Predetermined Isolated Portions of Disposable Absorbent Products" which issued to Kenneth B. Buell on March 28, 1978, and in U.S. Patent 4,253,461, entitled "Absorbent Brief" issued to Danny L. Strickland and Ronald B. Vischer on March 3, 1981, both of which are incorporated herein by reference. It should be noted that one or more (a plurality of) elastic members 77 can be used to elasticize each side panel 62. Preferably, three elastic members 77 are used to elasticize each side panel 62.

An elastic member 77 which has been found suitable is an elastic strand having a cross section of 0.18 mm by 1.5 mm and made from natural rubber as available from Easthampton Rubber Company of Stewart, Virginia, under the trademark L-1900 Rubber Compound. Other suitable elastic members 77 can be made from natural rubber, such as elastic tape sold under the trademark Fulflex 9411 by Fulflex Company of Middletown, Rhode Island. The elastic member 77 may also comprise any heat shrinkable material as is well known in the art. Other suitable elastic materials may comprise a wide variety of materials as are well known in the art include elastomeric films, polyurethane films, Lycra, elastomeric adhesives, elastomeric foams and formed elastic scrim. In addition, the elastic members 77 may take a multitude of configurations. For example, the width of the elastic members 77 may be varied; the elastic members may comprise a single strand or several parallel or non-parallel strands of elastic material; or the elastic members 77 may be rectilinear or curvilinear.

The spacing means 76 may alternatively comprise several other elements. For example, the side panels 62 may have stiffening means disposed in or on each side panel 62. The stiffening means must be sufficiently stiff so that the distal edge 66 is spaced away from the body-facing surface 40. Suitable materials for the stiffening means include foams, nonwoven fabrics, batting, polyethylene film, formed films, spray glues, foamed elastomerics, polyester, polyurethane, or high loft material.

The spacing means 76 may also comprise means for shortening the length of the distal edge 66 in comparison to the length of the edge of the diaper 20. The distal edge 66 can be shortened by making a fold or pleat in the distal edge 66.

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This fold or pleat is secured by any of the holding means well known to those of ordinary skill in the art, such as adhesives, or heat sealing. Alternatively, a section may be cut out of the distal edge 66 and the resultant edges brought together to form a butt or lap joint. The distal edge 66 may also be shortened by attaching a length of the distal edge 66 to the topsheet 38 at a position different from where the distal edge 66 would lie when the diaper 20 is in a flattened out condition. Other shortening means as are known in the art can also be used.

The manner in which the diaper 20 is applied to a wearer will vary depending on the embodiment that is being used. Thus, the preferred methods for using the different embodiments are described in more detail below. In each case, however, the distal edges 66 of the side panels 62 are pulled laterally outwardly such that the distal edges 66 are disposed outboard of the proximal edges 64 in the rear waist region 26. This provides a gasketing configuration about the buttocks of the wearer. The distal edges 66 of the side panels 62 remain inboard of the longitudinal edges 30 in the front waist region 22. Thus, the side panels 62 become inflected, forming barrier cuffs that stand-up in the wearer's "no motion" zone in the crotch region 26.

Figure 4 is a fragmentary sectional view of an alternative embodiment of the present invention taken in the front waist region 22. In this embodiment, the topsheet 38 folds around the side edges 50 of the absorbent core 44. Preferably, at least a portion of the topsheet 38 extends between the backsheet 42 and the garment-facing side 46 of the absorbent core 44. The topsheet 38 and the absorbent core 44 are preferably joined to the backsheet 42 using a layer of adhesive 37 or any other means as are known in the art. Further, as shown in Figure 4, the backsheet 42 includes a longitudinal hem 33 enclosing the elastic members 77. The hem 33 is preferably formed by wrapping a portion of the backsheet 42 around the elastic members 77 and securing the backsheet 42 to itself, inboard of the elastic members 77, with a bead of adhesive 35. Preferably, the backsheet 42 is wrapped around the elastic members 77 such that the inner surface 23 of the backsheet 42 contacts the elastic members 77 and the adhesive bead 35. This configuration helps prevent any liquid that is deposited on the inner surface 23 of the backsheet 42 from migrating beyond the distal edges 66 of the side panels 62 in the rear waist region 24 and the crotch region 26. This

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embodiment is generally considered less desirable than other embodiments, however, because only one ply of material is present in the side panels 62. Particularly, the side panels 62 come under substantial stress when the garment is worn. Depending on the nature of the backsheet 42, single ply side panels 62 may not be strong enough for active wearers.

Figure 5a illustrates another embodiment of the present invention. In this embodiment, the topsheet 38 comprises lateral extensions 21a which wrap around the backsheet 42 and are preferably secured to the outer surface 28 of the backsheet 42 with an adhesive bead 39 or other bonding means (e.g., pressure, heat, ultrasonics, etc.). This embodiment is particularly useful when the backsheet 42 is formed from a plastic film. Since most wearers do not like the feel of plastic next to their skin, covering the backsheet 42 with the extension 21a of the topsheet 38, which is typically made from a nonwoven fabric, presents a fabric effect on the body-facing surface 40 of the inwardly folded side panels 62 and provides the feel of cloth against the skin. (A particularly desirable material for use as the backsheet 42 is a polyfilm lined nonwoven, however, the backsheet 42 may comprise a woven or nonwoven material, polymeric films such as thermoplastic films or polyethylene or polypropylene, or composite materials such as film-coated nonwoven materials.) Another suitable construction of the side panels 62 provides the backsheet 42 comprising a laminate of a nonwoven and a polymeric film, wherein the nonwoven extends beyond the dimensions of the polymeric film to form the side panels 62.

Figure 5b is yet another alternative embodiment of the present invention wherein the topsheet 38 has lateral extensions 21b that comprise separate members joined to the topsheet 38. The lateral extensions 21b wrap around the backsheet 42 and are preferably secured to the outer surface 28 of the backsheet 42 with an adhesive bead 39 or other bonding means (e.g., pressure, heat, ultrasonics, etc.). In a preferred embodiment, the lateral extensions 21b comprise nonwoven materials that are hydrophobic, and thus, prevent liquids deposited on the topsheet 38 from wicking beyond the liquid impervious backsheet 42 disposed in the side panels 62. The lateral extensions 21b may be joined to the topsheet 38 by any means that are well known in the art, including, but not limited to, adhesives and dynamical mechanical bonding as described in U.S. Patent 4,919,783 entitled

"Dynamic Mechanical Bonding Method and Apparatus" issued to Ball et al., on April 24, 1990, which is herein incorporated by reference.

Figure 6 illustrates another embodiment of the present invention wherein the backsheet 42 includes a portion 25 which is wrapped around the elastic members 77 forming a longitudinal hem 33. The hem 33 is preferably formed by wrapping a portion of the backsheet 42 around the elastic members 77 and securing the backsheet 42 to itself, inboard of the elastic members 77, with a bead of adhesive 35. Preferably, the backsheet 42 is wrapped around the elastic members 77 such that the inner surface 23 of the backsheet 42 contacts the elastic members 77 and the adhesive bead 35. This configuration helps prevent any liquid that is deposited on the inner surface 23 of the backsheet 42 from migrating beyond the distal edges 66 of the side panels 62 in the rear waist region 24 and the crotch region 26. The topsheet 38 is preferably secured to the outer surface 28 of the portion 25 of the backsheet 42 that wraps around the elastic members 77 with an adhesive layer 39 or another suitable bonding means. In this configuration, the topsheet 38 will be presented against the skin of the wearer in at least the rear waist region 24.

Figure 8 shows one alternative embodiment of the present invention having ear flaps 54 extending laterally outwardly from the distal edges 66 of the side panels 62 in the rear waist region 24. The ear flaps 54 provide a structure which, along with the front waist region 22 and the rear waist region 24, encircle the waist of the wearer. Each ear flap 54 has a proximal edge 51 and a distal edge 53. In a preferred embodiment, at least one ear flap 54 is joined to each of the side panels 62. The proximal edge 51 of the ear flap 54 is preferably joined to distal edge 66 of the side panel 62. The proximal edge 51 of the ear flap 54 may be joined to garment-facing surface 41 of the backsheet 42, or to the body-facing surface 40 of the topsheet 38, or between the topsheet 38 and the backsheet 42. The ear flaps may be joined to the side panels 62 by any means as are known in the art; for example, the ear flaps 54 may be continuously or intermittently bonded to the side panels 62 using heated or unheated adhesive, heat bonding, pressure bonding, ultrasonic bonding, dynamic mechanical bonding or any other method that is known in the art.

The ear flaps 54 may take on a number of different sizes, shapes, configurations and materials. In a preferred embodiment, as shown in Fig. 9, the ear flaps may be generally rectangular in shape, having dimensions of between about 2 and 8 inches in the lateral direction and between about 2 and 8 inches in the longitudinal direction; the dimensions being measured while the ear flaps 54 are in a relaxed or unextended condition. Further, the ear flaps 54 may comprise a single piece of material or two or more pieces of material operatively associated to form each ear flap 54.

The ear flaps 54 are preferably joined to the distal edges 66 of the side panels 62 in the rear waist region 24 by attachment means (not shown) such as those well known in the art. A suitable means for attaching each ear flap 54 to the side panel 62 is fusion bonding (e.g. ultrasonic, heat or pressure bonding). Alternatively, the ear flaps 54 may be intermittently or continuously bonded to the side panels 62 using adhesive, dynamic mechanical bonding or any other method that is known in the art.

The ear flaps 54 are preferably extensible in at least the lateral direction, and may be formed from any suitable extensible, stretchable, or elastomeric material. (As used herein, the term "extensible" refers to materials that can increase in at least one dimension. The term "stretchable" refers to materials that are extensible when stretching forces are applied to the material, and offer some resistance to extension. The term "elastomeric" refers to materials that extend in at least one direction when a force is applied and return to approximately their original dimensions after the force is released.) One elastomeric material that has been found to be especially suitable for use in the ear flaps 54 is a laminate of two coverstock layers with an elastomeric film sandwiched between the coverstock layers. As used herein, the term "coverstock" may include any woven or nonwoven materials. An example of a suitable coverstock material is the nonwoven material manufactured by Veratec, Inc., a Division of the International Paper Company, of Walpole, Mass., designated P-8. An example of a suitable film to be sandwiched between coverstock layers is the elastomeric film, EXX-500, manufactured by the Exxon Chemical Company of Lake Zurich, IL. Suitable alternative materials for use as the ear flaps 54 include woven webs; nonwoven webs; films, including polymeric films; foams; laminate materials,

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including film laminates, nonwoven laminates, or zero strain laminates; elastomers; elastomeric scrim; composites; structural elastic-like film webs; or any combination of materials as are known in the art. U.S. Patent 5,151,092 entitled "Absorbent Article with Dynamic Elastic Waist Feature Having a Predisposed Resilient Flexural Hinge" issued to Buell et al., on September 29, 1992, and U.S. Patent 5,167,897 entitled "Method For Incrementally Stretching a Zero Strain Stretch Laminate Web to Impart Elasticity Thereto" issued to Weber et al., on December 1, 1992 describe suitable zero strain laminates and prestrained stretch laminates, and are herein incorporated by reference.

The ear flaps 54 preferably additionally comprise fastening elements 56 disposed adjacent their distal edges 53. While the fastening elements 56 may comprise any of a number of fastening elements as are known in the art such as mechanical fasteners, hook and loop type fasteners, pressure sensitive adhesives, and cohesive materials, in a preferred embodiment of the present invention, the fastening elements 56 preferably comprises tape tabs. The tape tab fasteners 56 can be any of those tape tabs well known in the art, such as the adhesive fastening tape tabs disclosed in U.S. Patent 3,848,594 entitled "Tape Fastening System For Disposable Diaper" issued to Kenneth B. Buell on November 19, 1974. Examples of other fastening systems, including mechanical fastening systems are disclosed in U.S. Patent 4,869,724 issued to Scripps on September 26, 1989; U.S. Patent 4,846,815 issued to Scripps on July 11, 1989; and U.S. Patent 5,242,436 issued to Weil, Buell, Clear and Falcons on September 7, 1993; each of which is incorporated herein by reference.

The embodiment of the present invention comprising ear flaps 54 is preferably fitted to the wearer as follows. The ear flaps 54 are initially unfolded from their folded configuration for packaging (as shown in Fig. 9) and pulled laterally outwardly in opposite directions. The rear waist region 24 is positioned under the wearer's back and the remainder of the diaper is drawn between the wearer's legs. The front waist region 22 is then positioned across the front of the wearer's waist. The ear flaps 54 are then wrapped around the wearer's waist; the side panels are tensioned and extended so as to conform to the size and shape of the wearer. The ear flaps 54 are then fastened to the front waist region 22 by means of the fastening elements 56 disposed adjacent the distal edges 53 of the ear

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flaps 54.

Figures 10a and 10b show alternative embodiments of the present invention additionally comprising belts. As shown in Figure 10a, the belt 120 can be permanently attached to the diaper 20. Alternatively, as shown in Figure 10b, the belt 120 can be a reusable separate element that is releasably affixed to the diaper 20 during use. In either case, the belt 120 is preferably disposed in the rear waist region 24 adjacent the end edge 32 of the diaper 20. The belt 120 may take on a number of different sizes, shapes, configurations and materials as are known in the art. An example of an absorbent article comprising belts that are suitable for use with the present invention is described in U.S. Patent 4,964,860 entitled "Detachable Two Piece Absorbent Garment" issued to Gipson et al., on October 23, 1990.

As shown in Figures 10a and 10b, the embodiments of the present invention that comprise belts preferably additionally comprise fastening elements disposed in the front waist region 22. These front waist region fastening elements 122 provide a means for fastening the front waist region 22 to the rear waist region 24 or the belt 120 when the diaper 20 is fitted to the wearer. In a preferred embodiment, at least one front waist region fastening element 122 is disposed in the front waist region 22. More preferably, as shown in Figures 10a and 10b, a front waist region fastening element is disposed adjacent each longitudinal edge 30 of the diaper in the front waist region 22. The front waist region fastening elements 122 may take on a number of different sizes, shapes and materials. In one preferred embodiment, the front waist region fastening elements 122 comprise pressure sensitive adhesives. Alternatively, the front waist region fastening elements 122 may comprise hook and loop type fastening material, as described in the above mentioned U.S. Patent 4,964,860.

The belted diaper configuration of the present invention is preferably fitted to the wearer by first inflecting the side panel 62. This is done by either pulling laterally outwardly on the side panels 62 in the rear waist region 24, or by pulling laterally outwardly on the ends of the belt 120 which in turn provides tension to flip out the side panels 62 in the rear waist region 24. The rear waist region 24 of the diaper 20 is then placed under the wearer's back. The diaperer then pulls the

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remainder of the diaper 20 between the wearer's legs so that the front waist region 22 is positioned across the front of the wearer. The belt 120 is then fastened about the waist of the wearer and the front waist region fastening elements 122 are fastened to the belt 120 forming a closure between the front waist region 22 and the rear waist region 24. In this configuration, the distal edges 66 of the side panels 62 in the rear waist region 24 provide a gasket about the buttocks of the wearer and provide an inflected barrier cuff that stands up in the no motion zone of the crotch region 26.

Figure 11 shows a pad embodiment of the present invention comprising a means for fastening the absorbent article to the wearer's pants. In a preferred embodiment, the pad 1120 comprises a front waist region securement member 112 and a rear waist region securement member 110. The front waist region securement member 112 is preferably disposed adjacent the end edge 32 of the pad 1120 in the front waist region 22, and the rear waist region securement member 110 is preferably disposed adjacent the end edge 32 of the pad 1120 in the rear waist region 24. Any adhesive, glue, mechanical fastening means, hook and loop type fastener or any other fastening means known in the art can be used for the securement members, with pressure sensitive adhesives being preferred. A suitable adhesive is Instant Lock 34-2823 manufactured by the National Starch and Chemical Company of Bridgewater, NJ. Suitable adhesive fasteners are also described in U.S. Patent 4,917,697, entitled "Sanitary Napkins Having Flaps and Stress Relief Means" issued to Osborn, III et al., on April 17, 1990. If a pressure sensitive adhesive is used, the adhesive is typically covered with a removable release liner in order to keep the adhesive from drying out, becoming contaminated or adhering to a surface other than the intended surface prior to use. Suitable release liners are described in the above mentioned U.S. Patent 4,917,697. Any commercially available release liners commonly used for such purposes can be utilized herein. Non-limiting examples of suitable release liners are BL30MG-A SILOX E1/O and BL30MG-A SILOX 4P/O both of which are manufactured by the Akroil Corporation of Menasha, WI.

The pad embodiment of the present invention, as shown in Figure 11, is fitted to the wearer by first inflecting the side panels 62. This is done by pulling laterally outwardly on the side panels 62 in the rear waist region 24. The diaperer

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then removes any release liner(s) and positions the pad into the wearer's undergarment. Preferably, the front waist region 22 should be positioned in the front of the wearer's undergarment and the rear waist region 24 should be placed in the rear of the wearer's undergarment. In this configuration, the distal edges 66 of the side panels 62 in the rear waist region 24 provide gasketing about the wearer's buttocks while the distal edges 66 of the side panels 62 in the crotch region 26 stand up to provide an inflected barrier cuff in the wearer's no motion zone.

Figures 12a and 12b show yet other alternative embodiments of the present invention. The diapers 20 shown in Figures 12a and 12b each have a front waist region 22, a rear waist region 24, a crotch region 26, a lateral centerline 34 and a longitudinal centerline 36. The diaper 20 preferably further comprises a liquid pervious topsheet 38, a liquid impervious backsheet 42, an absorbent core 44, side panels 62, a spacing means 76 (such as the elastic members 77), and closing means 78. (The spacing means 76 and the closing means 78 may comprise any of those hereinbefore described with regard to this invention.) In the embodiments shown in Figures 12a and 12b, the side panels 62 each include a front ear flap section 10 located in the front waist region 22, and a barrier cuff section 12 that extends longitudinally from the crotch region 26 to at least the rear waist region 24. Each side panel 62 has a proximal edge 64 and a distal edge 66. Each barrier cuff section 12 has a first end edge 14 located longitudinally inboard of the front ear flap section 10 and a second end edge 16 located in or juxtaposed the rear waist region 24. (As used herein, the term "longitudinally inboard" is defined as the direction toward the lateral centerline 34 of the diaper 20.)

In one preferred configuration of the embodiments shown in Figures 12a and 12b, the distal edges 66 of the side panels 62 are unsecured to any underlying structure of the diaper 20 in the front waist region 22 and the rear waist region 24 while the distal edge 66 of at least a portion of the barrier cuff section 12 juxtaposed the first end edge is secured laterally inboard of the proximal edge 64 by the closing means 78. This configuration inverts the second end edges 16 of the side panels 62 with regard to the first end edges 14, thus creating an inflected barrier cuff that stands up in the crotch region 26 when the diaper 20 is fitted to a wearer. This configuration also provides a front ear flap 10 in the front waist

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region 22 of the diaper 20 that can be extended laterally outwardly to provide a greater amount of material in the front waist region 22 to better contain exudates or to provide a greater area to which the rear waist region 24 may be joined when the diaper 20 is fitted to a wearer. This embodiment of the present invention can also be provided with rear waist region ear flaps 15. The rear waist region ear flaps 15 may comprise any of the materials and may be joined in any way as previously discussed in this application with regard to the ear flaps 54. Further, the rear waist region ear flaps 15 may be permanently joined with said front waist region 22 to form a pant.

In an alternative configuration of the embodiments shown in Figures 12a and 12b, the inflected barrier cuffs may comprise side panels 62 that are "x-folded" (not shown). As used herein, the term "x-folded" refers to side panels 62 that comprise at least some portion which is folded over itself such that at least one surface of the side panel is juxtaposed and in an overlapping configuration with another portion of the same surface of the side panel. The x-folded configuration provides the benefits described above with regard to an inflected barrier cuff while ensuring that a skin-friendly material is against the skin of the wearer throughout the length of the barrier cuff. Some preferred embodiments of x-folded side panels are disclosed in co-pending U.S. Patent Application Serial No. 08/310,173 filed on September 21, 1994 in the names of Benjamin et al., which is hereby incorporated by reference herein.

The diapers shown in Figures 12a and 12b may be manufactured using the following method. First, a generally rectangular chassis 18 is provided having a inner surface 11, an opposing outer surface 13, a front waist region 22, a rear waist region 24, a crotch region 26 located between the front waist region 22 and the rear waist region 24, a lateral centerline 34, a longitudinal centerline 36, and a pair of laterally opposed side panels 62 extending longitudinally from the front waist region 22 to the rear waist region 24. The side panels each have a proximal edge 64, a distal edge 66 and a second end edge 16 located in the rear waist region 24.

The side panels 62 are separated between the front waist region 22 and the crotch region 26 forming a first end edge 14 located in the crotch region 26. The

side panels 62 may be separated by any means as are known in the art, including, but not limited to, slitting, cutting, tearing, or perforating, using knives, lasers, heat, pressure, ultrasound or any combination of these. In one preferred embodiment, as shown in Figure 12a, the separation is a relatively straight separation in a direction relatively parallel to the lateral centerline 34. However, in other preferred embodiments, one of which is shown in Figure 12b, the separation is curvilinear or at an angle to lateral centerline. (As used herein, the term "curvilinear" refers to any separation that is not relatively straight, but rather comprises at least one curve.)

Either before or after the separation step has been completed, the side panels 62 are folded over the chassis 18. Once the separation step has been performed, a portion of the side panel juxtaposed the first end edge 14 is secured to the inner surface 11 of the chassis 18 in the crotch region 26. This ensures that at least a portion of the side panel 62 juxtaposed the first end edge 14 is inverted relative to the second end edge 16, thus, providing an inflected barrier cuff that stands up in the crotch region when the diaper is fitted to a wearer. (If a z-fold configuration is desired, at least a portion of each side panel 62 juxtaposed the first end edge 14 is folded back upon itself and preferably secured thereto.) If a pant configuration is preferred, the rear waist region ear flaps 15 are permanently joined with said front waist region 22 to form the pant. A more detailed discussion of methods for manufacturing diapers with inflected barrier cuffs is disclosed in co-pending U.S. Patent Application Serial No. 08/260,638 which was filed on June 16, 1994 in the names of Sager et al., which is hereby incorporated by reference herein.

The configuration of the diaper 20 shown in Figures 12a and 12b is preferably fitted to the wearer by extending the side panels 62 laterally outwardly in at least the rear waist region 24. If desired, the side panels 62 may be extended laterally outwardly in the front waist region 22 forming front ear flaps 10. (If the diaper 20 was manufactured with perforations at the separation between the front waist region 22 and the crotch region 26, the user will have to tear or otherwise completely separate the perforations to release the front ear flaps 10 from the barrier cuff section of the side panels 62.) The rear waist region 24 is placed under the wearer's back and the remainder of the diaper is drawn between the legs

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WHAT IS CLAIMED IS:

1. A disposable absorbent article having a front waist region, a rear waist region, a crotch region between said front waist region and said rear waist region, a pair of longitudinal edges, a lateral centerline and a longitudinal centerline, the absorbent article comprising:

a chassis comprising a pair of longitudinally extending side panels, each of said side panels including a front ear flap section; a barrier cuff section having a first end edge located longitudinally inboard of said front ear flap section; a second end edge located in said rear waist region; a proximal edge and a distal edge;

spacing means joined with each said barrier cuff section; and

closing means for securing at least a portion of said barrier cuff section juxtaposed said first end edge to the absorbent article inboard of said proximal edge;

characterized in that said distal edges are unsecured to any underlying structure of the absorbent article in said front waist region and said rear waist region such that said distal edges form said longitudinal edges in said front waist region and said rear waist region; and

said distal edge of said barrier cuff section being secured laterally inboard of said proximal edge in said crotch region such that said second end edges of said side panels located in said rear waist region are inverted relative to said first end edges to form an inflected barrier cuff that stands up in said crotch region when the absorbent article is fitted to a wearer.

2. A disposable absorbent article having a front waist region, a rear waist region, a crotch region between said front waist region and said rear waist region, a pair of longitudinal edges, a lateral centerline and a longitudinal centerline, the absorbent article comprising:

a chassis comprising a pair of longitudinally extending side panels, each of said side panels including a front ear flap section; a barrier cuff section having

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a first end edge located longitudinally inboard of said front ear flap section; a second end edge located in said rear waist region; a proximal edge and a distal edge;

spacing means joined with each said barrier cuff section; and

closing means for securing at least a portion of said barrier cuff section juxtaposed said first end edge to the absorbent article inboard of said proximal edge;

characterized in that said front ear flap sections are separably joined to said barrier cuff sections, wherein said distal edges of said ear flap sections may be separated from said barrier cuff section when the absorbent article is fitted to a wearer such that said distal edges of said front ear flap sections form said longitudinal edges in said front waist region;

said distal edges being unsecured to any underlying structure of the absorbent article in said rear waist region such that said distal edges form said longitudinal edges in said rear waist region; and

said distal edge of said barrier cuff section being secured laterally inboard of said proximal edge in said crotch region such that said second end edges of said side panels located in said rear waist region are inverted relative to said first end edges to form an inflected barrier cuff that stands up in said crotch region when the absorbent article is fitted to said wearer.

3. The absorbent article of Claims 1 or 2 wherein said chassis further comprises a liquid pervious topsheet; a liquid impervious backsheet joined with said topsheet; and an absorbent core interposed between said topsheet and said backsheet.
4. The absorbent article of any of the preceding claims preferably comprising an ear flap joined to and extending outwardly from each said side panel in the rear waist region, said ear flap preferably comprising a fastening means for securing the absorbent article about the waist of the wearer, wherein said fastening means preferably comprises a tape tab having one end secured to said ear flap and a second end for attachment to said front waist region.
5. The absorbent article of Claim 4 wherein said ear flaps comprise a stretch laminate comprising a layer of elastomeric film sandwiched between two layers of nonwoven fabric.

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6. The absorbent article of Claims 4 or 5 wherein said ear flaps are permanently joined to said front waist region to form a pant.
7. The absorbent article of any of the preceding Claims wherein said side panels are x-folded in at least said barrier cuff section.
8. A method for manufacturing an absorbent article having inflected barrier cuffs, said method characterized by and comprising the steps of:

providing a generally rectangular chassis having a front waist region; a rear waist region; a crotch region located between said front waist region and said rear waist region; a longitudinal centerline; a lateral centerline; and a pair of laterally opposed side panels extending longitudinally from said front waist region to said rear waist region, said side panels each having a proximal edge, a distal edge and a second end edge located in said rear waist region;

separating said side panels between said front waist region and said crotch region, said separation forming a side panel first end edge in said crotch region;

folding said distal edge juxtaposed said first end edge inwardly over said chassis; and

securing a portion of said first end edge to said chassis in said crotch region wherein said portion of said first end edge in said crotch region is inverted relative to said distal edge in said rear waist region such that an inflected barrier cuff is formed that will stand up in the crotch region when the absorbent article is fitted to a wearer.

9. The method of Claim 8 wherein said step of separating said side panels is performed by slitting said side panels, or wherein said step of separating said side panels between said front waist region and said crotch region includes perforating said side panels.
10. The method of Claims 8 or 9 wherein said separation is made relatively perpendicular to said longitudinal centerline, or wherein said separation is made at an angle that is not perpendicular to said longitudinal centerline, or wherein said separation is generally curvilinear.

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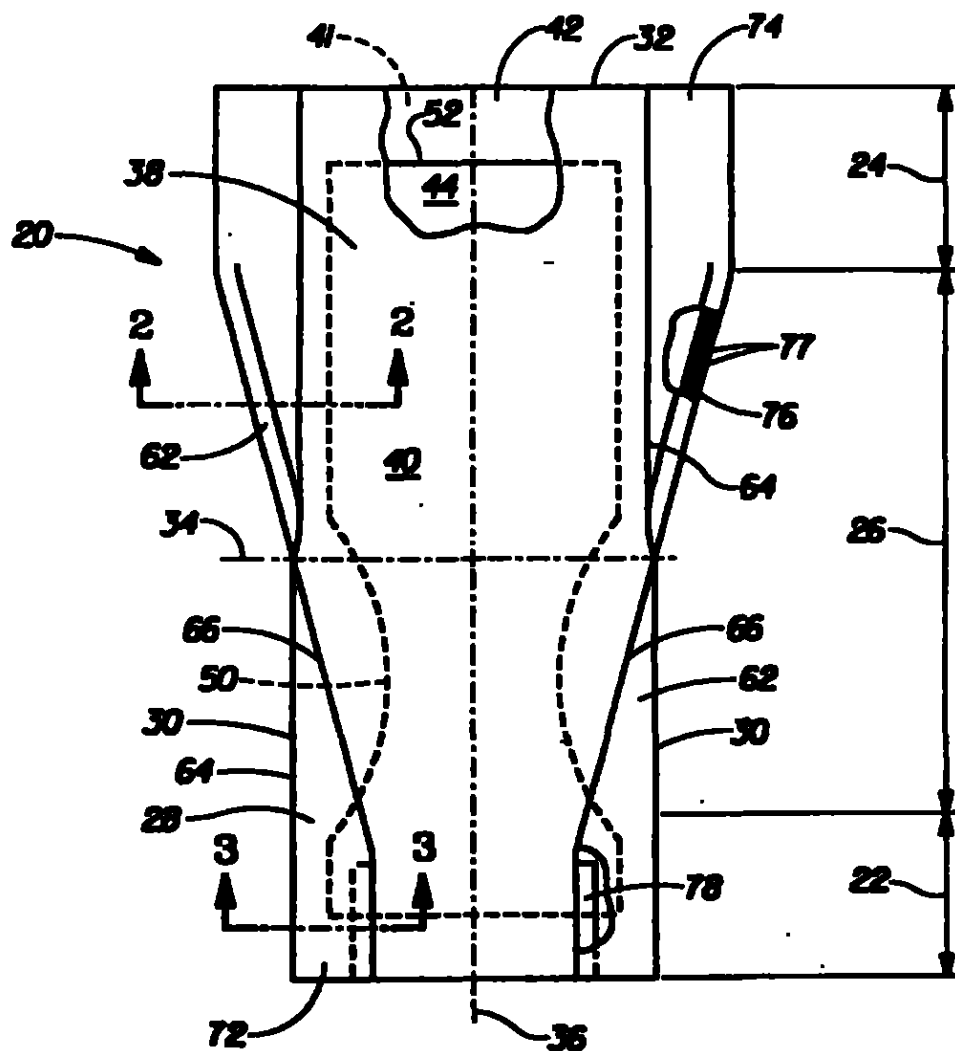


Fig. 1

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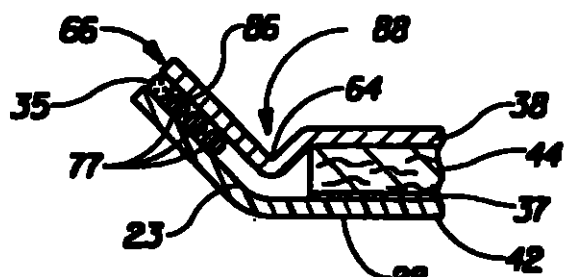


Fig. 2

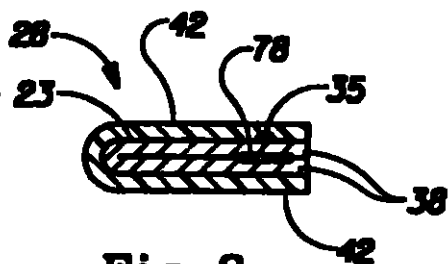


Fig. 3

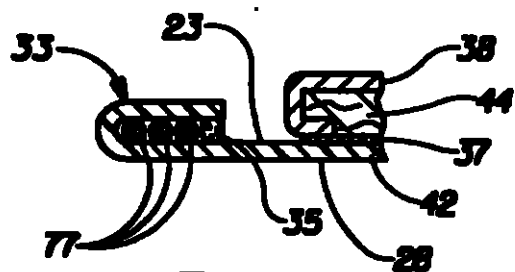


Fig. 4

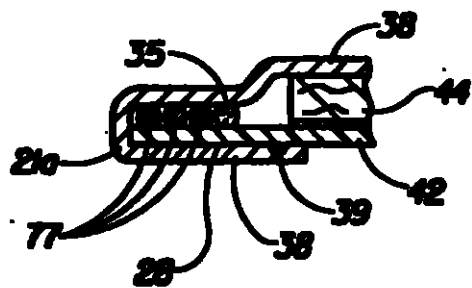


Fig. 5a

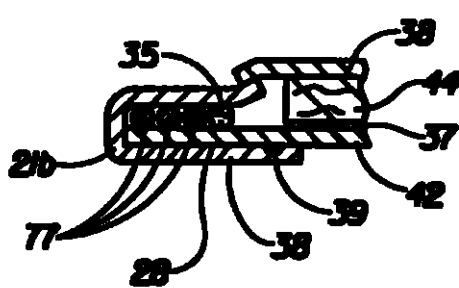


Fig. 5b

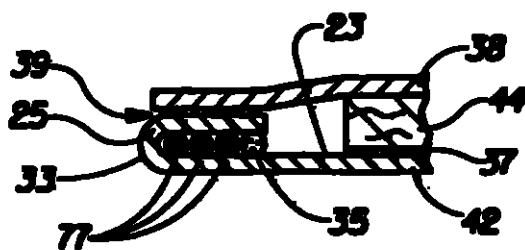


Fig. 6

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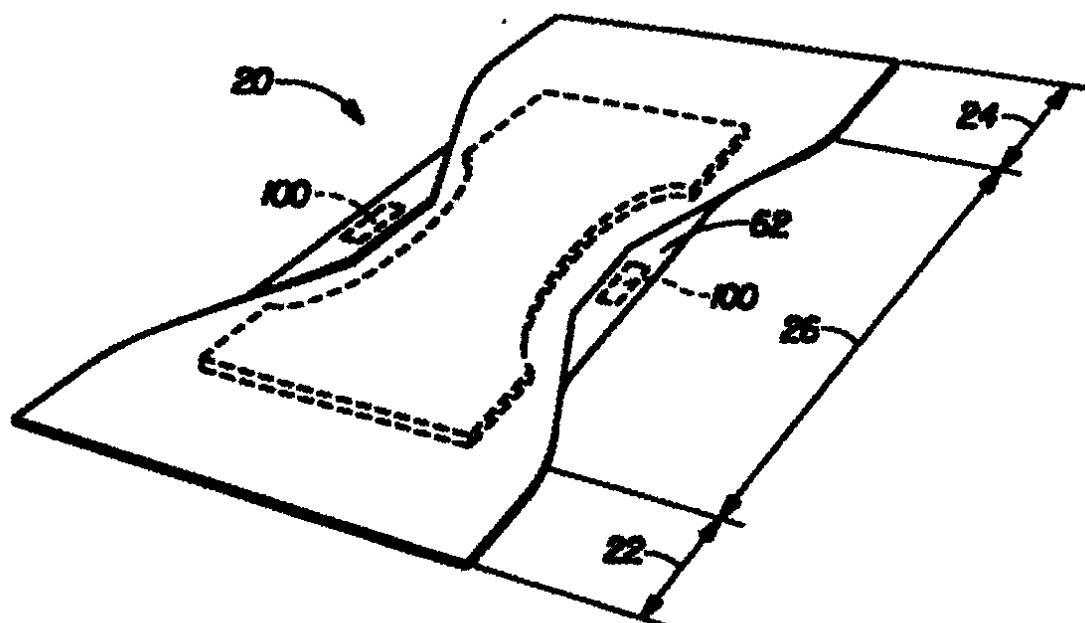


Fig. 7

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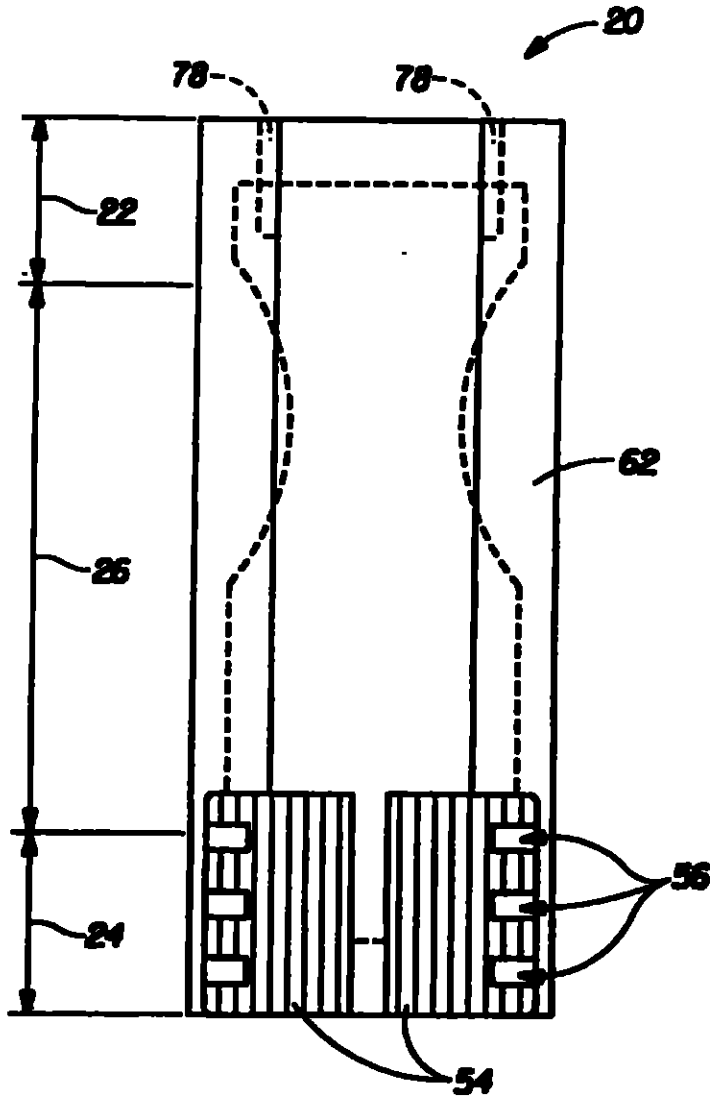


Fig. 9

Fig 245

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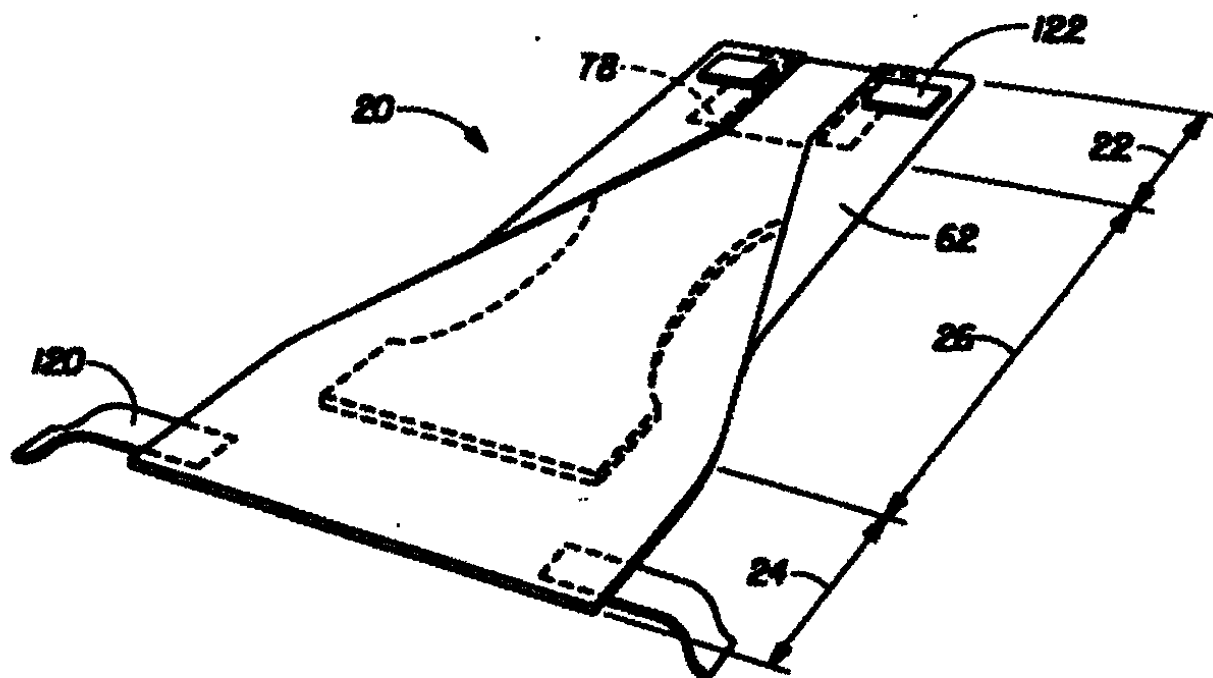


Fig. 10a

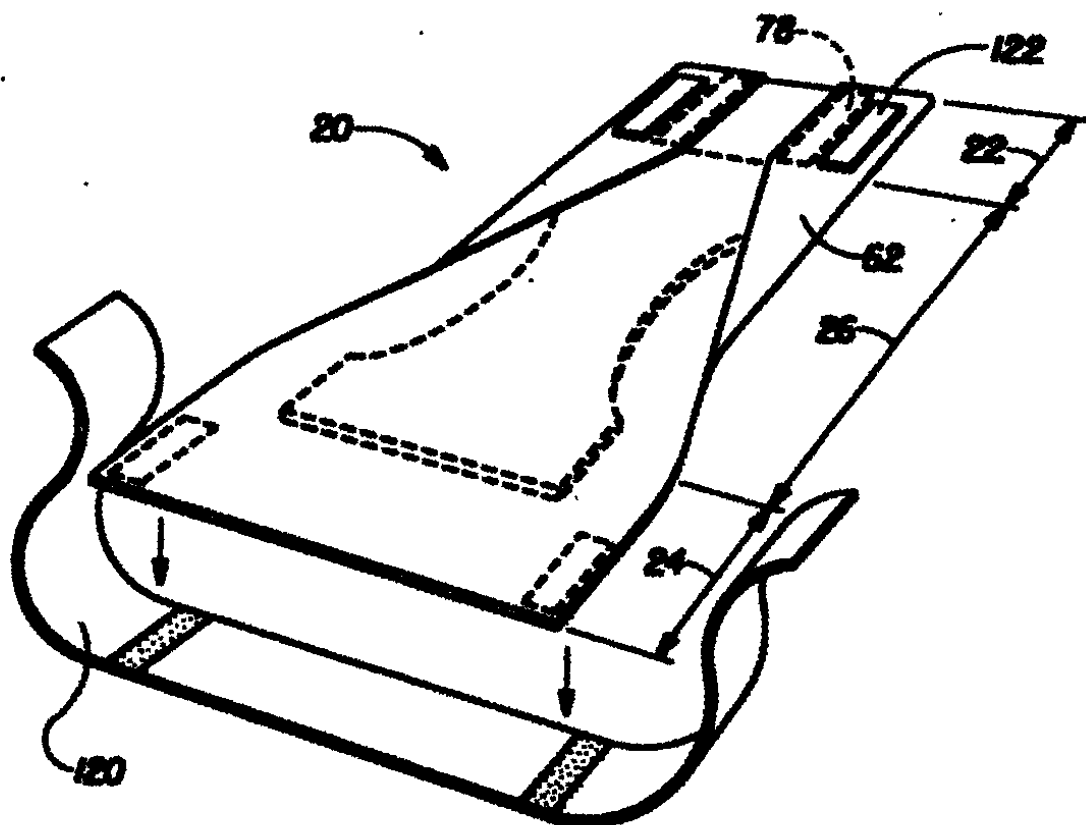


Fig. 10b

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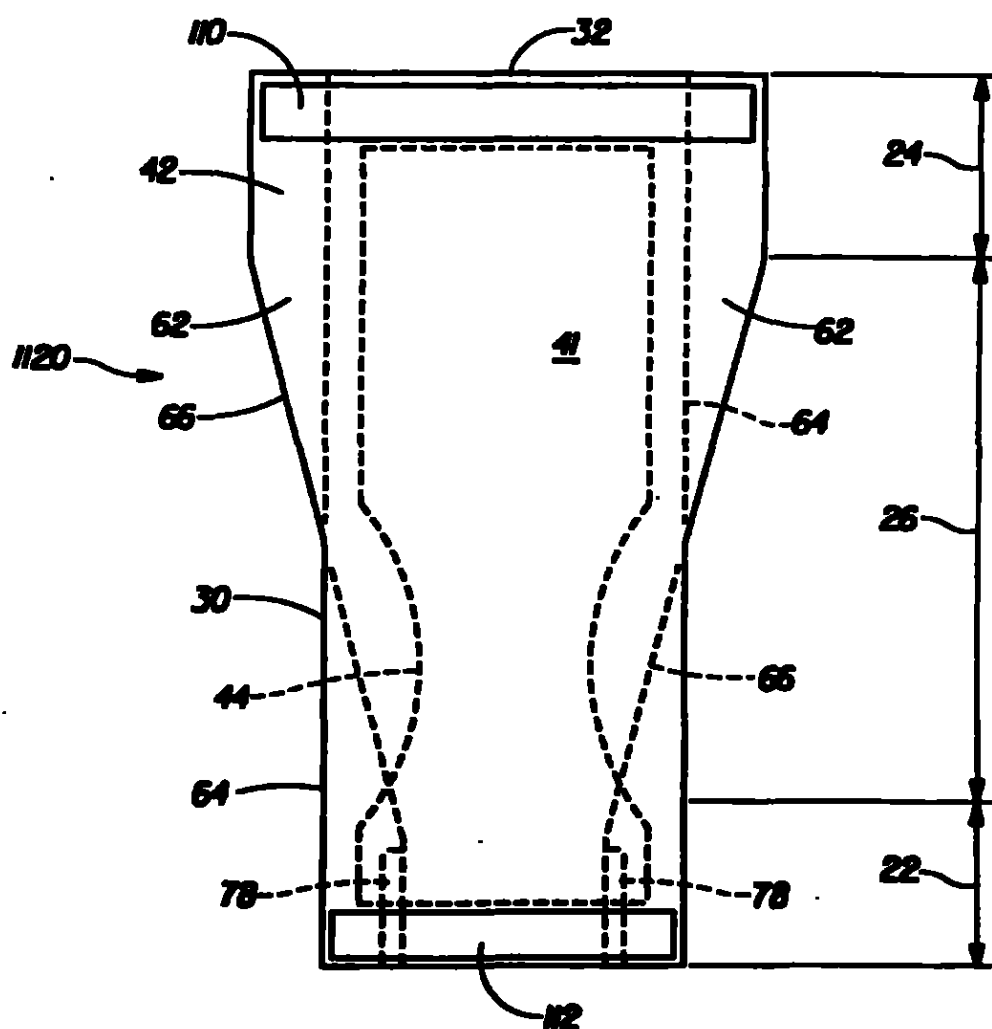


Fig. 11

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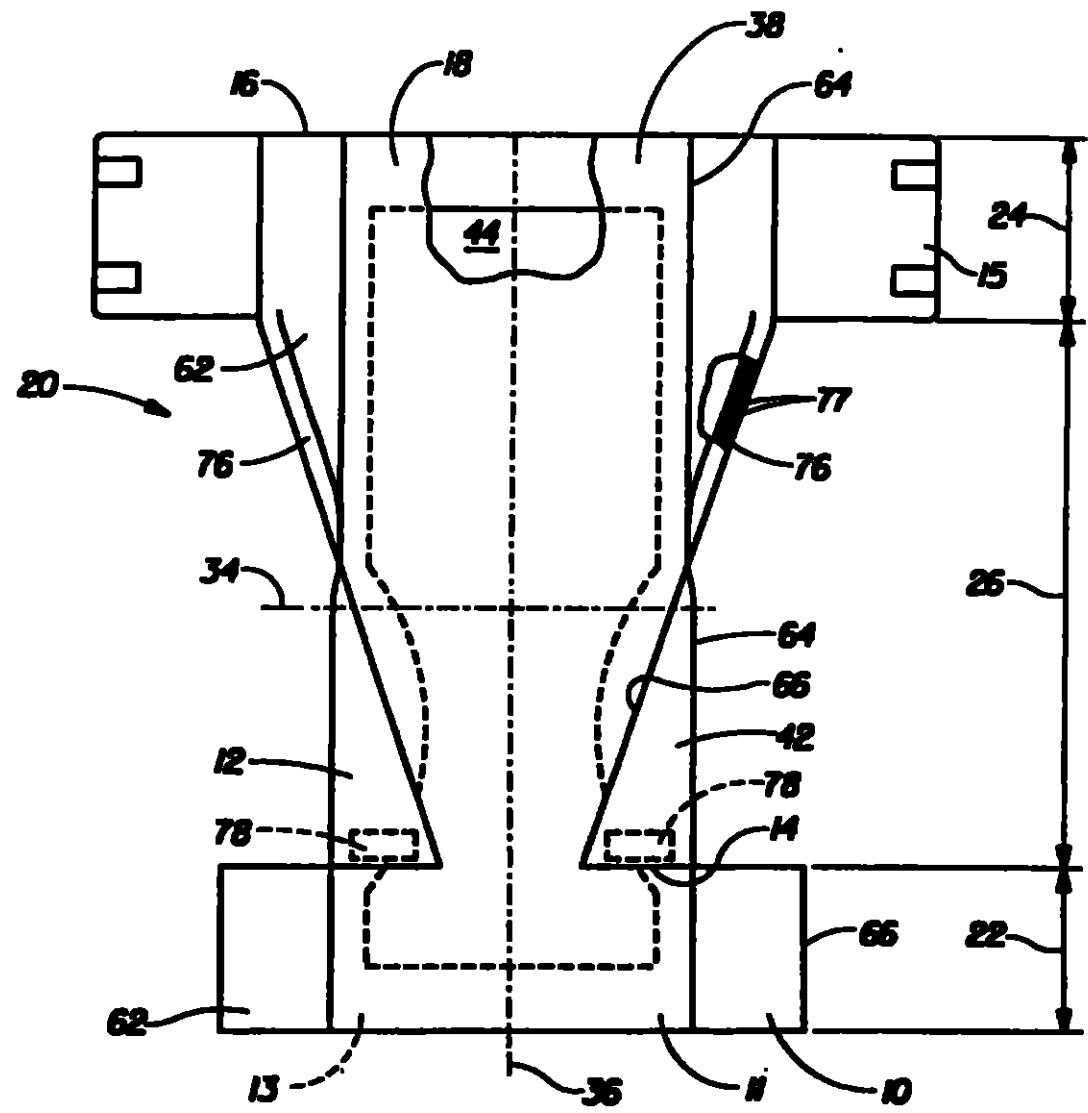


Fig. 12a

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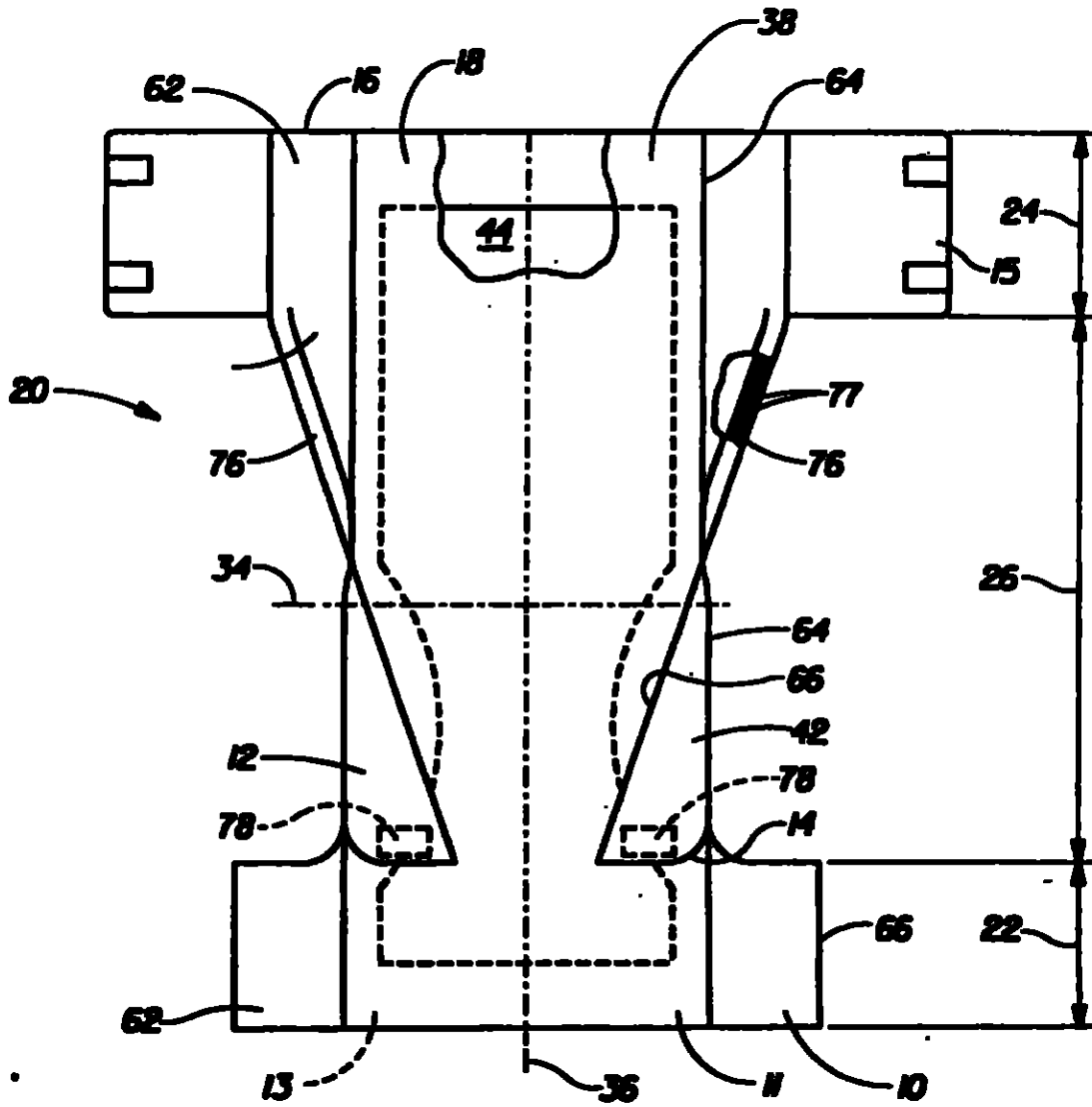


Fig. 12b

INTERNATIONAL SEARCH REPORT

Internat. Application No.
PCT/US 95/13882

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61F13/15

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)

IPC 6 A61F

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO,A,95 18591 (THE PROCTER & GAMBLE COMPANY) 13 July 1995 see page 17, paragraph 2 - paragraph 3; figures ---	1,3-5
X	FR,A,2 572 982 (COLGATE PALMOLIVE) 16 May 1986 see claims; figures ---	1,3-7
X	US,A,3 863 637 (MACDONALD ET AL) 4 February 1975 see the whole document ---	1,3-7
X	DE,A,25 15 448 (COLGATE PALMOLIVE CO) 21 October 1976 see claims; figures ---	1,3-7
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☒ Further documents are listed in the continuation of part C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
"B" earlier document but published on or after the international filing date
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"F" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to substantiate 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 considered 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

1 March 1996

Date of mailing of the international search report

07.03.96

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Authorized officer

Douskas, K

INTERNATIONAL SEARCH REPORT

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C.A. (Class. Int.) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Classification of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,3 978 861 (SCHAAR) 7 September 1976 see claims; figures ---	1,2
X	GB,A,1 513 855 (MCCULLINS) 7 June 1978 see claims; figures ---	1,3-7
A	FR,A,2 425 285 (CONSORTIUM GENERAL TEXTILE) 7 December 1979 see claims; figures ---	1,7
A	US,A,5 887 255 (SIMS) 11 February 1992 ---	1
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Form PCT/ISA/210 (publication of revised sheet) (July 1993)

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No.

PCT/US 95/13882

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US-A-3863637	04-02-75	NONE	
DE-A-2515448	21-10-76	NONE	
US-A-3978861	07-09-76	US-A- 3938581 AT-B- 363414 AU-B- 582314 AU-B- 8139875 BE-A- 829346 CA-A- 1842686 CH-A- 587618 DE-A- 2521621 FR-A,B 2271779 GB-A- 1514381 GB-A- 1514382 JP-C- 1228432 JP-A- 58161347 JP-B- 58853881 NL-A- 7506868 SE-B- 488698 SE-A- 7505638 SE-B- 433291 SE-A- 7788171	06-01-76 10-08-81 19-07-79 25-11-76 15-09-75 21-11-78 13-05-77 04-12-75 19-12-75 14-06-78 14-06-78 26-07-84 27-12-75 26-11-83 25-11-75 18-04-78 24-11-75 21-05-84 14-07-77
GB-A-1513855	07-06-78	NONE	
FR-A-2425285	07-12-79	US-A- 4218143	01-07-80
US-A-5887255	11-02-92	AU-B- 4697289 CA-A- 1332868 EP-A- 6374648	28-06-90 08-11-94 27-06-90

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23

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No
PCT/US 95/13882

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-5087255		JP-A- 3136655	11-06-91
US-A-4964860	23-10-90	NONE	

223 252

Case # 17585
COLOMBIA253
X
2CERTIFICATIONSTATE OF WISCONSIN)
) SS
COUNTY OF WINNEBAGO)

I hereby certify that the attached paper constitutes a true copy of the original of a certain Assignment to KIMBERLY-CLARK WORLDWIDE, INC. by Bridge A. Balogh, David F. Bishop, and Danielle K. Minnich of the subject matter disclosed in an application for Letters Patent of the United States entitled

ABSORBENT ARTICLE HAVING A BODY CONFORMING ABSORBENT COMPOSITE

which was signed by the said Bridget A. Balogh and Danielle K. Minnich on April 4, 2002; David F. Bishop on April 10, 2002.

December 10, 2003
Date

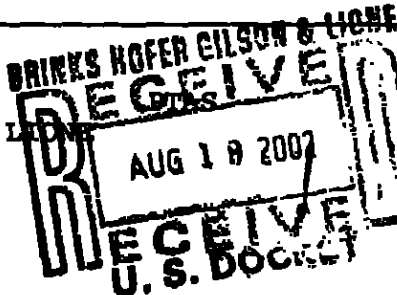
Melissa A. Blob
Melissa A. Blob, Notary Public
My Commission Expires: August 1, 2004

(Legalization required)

UNITED STATES
PATENT AND
TRADEMARK OFFICE

AUGUST 13, 2002

BRINKS HOFER GILSON & LIDNE
ANDREW D. STOVER
P.O. BOX 10395
CHICAGO, IL 60610



17,585
Chief Information Officer
Washington, DC 20231
www.uspto.gov

UNITED STATES PATENT AND TRADEMARK OFFICE
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, ASSIGNMENT DIVISION, BOX ASSIGNMENTS, CG-4, 1213 JEFFERSON DAVIS HWY, SUITE 320, WASHINGTON, D.C. 20231.

RECORDATION DATE: 06/07/2002

REEL/FRAME: 012978/0875
NUMBER OF PAGES: 5

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:

BALOGH, BRIDGET A.

DOC DATE: 04/04/2002

ASSIGNOR:

BISHOP, DAVID F.

DOC DATE: 04/10/2002

ASSIGNOR:

MINNICH, DANIELLE K.

DOC DATE: 04/04/2002

ASSIGNEE:

KIMBERLY-CLARK WORLDWIDE, INC.
401 NORTH LAKE STREET
NEENAH, WISCONSIN 54956-0349

SERIAL NUMBER: 10053251
PATENT NUMBER:

FILING DATE: 11/02/2001
ISSUE DATE:

PAULA MCCRAY, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

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ASSIGNMENT

WHEREAS, Bridget A. Balogh, David F. Bishop and Danielle K. Minnich, hereinafter called the "Assignors", have made the invention described in the United States patent application entitled **ABSORBENT GARMENT HAVING A BODY CONFORMING ABSORBENT COMPOSITE**, for a full description of which reference is here made to an application for Letters Patent of the United States filed on November 2, 2001, and assigned Application Serial No. 10/053,251;

WHEREAS, Kimberly-Clark Worldwide, Inc., a corporation organized and existing under the laws of the State of Delaware, having a place of business at 401 North Lake Street, Neenah, Wisconsin 54956-0349, hereinafter called the "Assignee", desires to acquire the entire right, title and interest in and to the invention and the patent application identified above, and all patents which may be obtained for said invention, as set forth below;

NOW, THEREFORE, in consideration of the sum of One Dollar (\$1.00), and other valuable and legally sufficient consideration, the receipt of which by the Assignors from the Assignee is hereby acknowledged, the Assignors have sold, assigned and transferred, and by these presents do sell, assign and transfer to the Assignee, the entire right, title and interest for the United States in and to the invention and the patent application identified above, and any patents that may issue for said invention in the United States; together with the entire right, title and interest in and to said invention and all patent applications and patents therefor in all countries foreign to the United States, including the full right to claim for any such application all benefits and priority rights under any applicable convention; together with the entire right, title and interest in and to all continuations, divisions, renewals and extensions of any of the patent applications and patents defined above; to have and to hold for the sole and exclusive use and benefit of the Assignee, its successors and assigns, to the full end of the term or terms for all such patents.

The Assignors hereby covenant and agree, for both the Assignors and the Assignors' legal representatives, that the Assignors will assist the Assignee in the prosecution of the patent application identified above; in the making and prosecution of any other patent applications that the Assignee may elect to make covering the invention identified above; in

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vesting in the Assignee like exclusive title in and to all such other patent applications and patents; and in the prosecution of any interference which may arise involving said invention, or any such patent application or patent; and that the Assignors will execute and deliver to the Assignee any and all additional papers which may be requested by the Assignee to carry out the terms of this Assignment.

The Commissioner of Patents and Trademarks is hereby authorized and requested to issue patents to the Assignee in accordance with the terms of this Assignment.

IN TESTIMONY WHEREOF, the Assignors have executed this agreement.

Dated: April 4, 2002

Bridget A. Balogh
BRIDGET A. BALOGH

STATE OF)
COUNTY OF) ss.

I, Mary L. Roberts, a Notary Public in and for the County and State aforesaid, do hereby certify that BRIDGET A. BALOGH, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and Notarial Seal, this 4th day of April, 2002.

(SEAL) MARY L. ROBERTS
NOTARY
PUBLIC
STATE OF WISCONSIN
My Commission Expires: 5/18/2003

Mary L. Roberts
Notary Public

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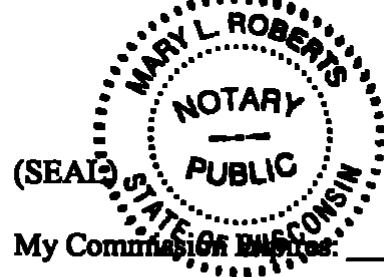
Dated: April 10, 2002

David F. Bishop
DAVID F. BISHOP

STATE OF)
COUNTY OF) ss.

I, Mary L. Roberts, a Notary Public in and for the County and State aforesaid, do hereby certify that DAVID F. BISHOP, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and Notarial Seal, this 10th day of April, 2002.



Mary L. Roberts
Notary Public

My Commission Expires: 5/12/2003

259

[Handwritten signature]

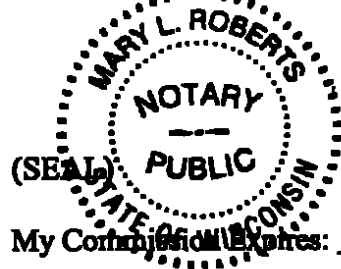
Dated: April 4, 2002

Danielle K Minnich
DANIELLE K. MINNICH

STATE OF)
) ss.
COUNTY OF)

I, Mary L. Roberts, a Notary Public in and for the County and State aforesaid, do hereby certify that DANIELLE K. MINNICH, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and Notarial Seal, this 4th day of April, 2002.



Mary L. Roberts
Notary Public

My Commission Expires: 5/18/2005

THE STATE OF WISCONSIN

**Office of the
Secretary of State**

APOSTILLE

(Convention de La Haye du 5 octobre 1961)

24/12/03

1. Country: United States of America
2. This public document has been signed by Melissa A Blob
3. acting in the capacity of Notary Public, State of Wisconsin
4. bears the seal/stamp of Notary Public, State of Wisconsin

CERTIFIED

5. at Madison, Wisconsin
6. December 18, 2003
7. by the Secretary of State of Wisconsin
8. No. 94367

9. Seal/stamp:



10. Signature:

Douglas La Follette

DOUGLAS LA FOLLETTE
Secretary of State

242
261
SUPERINDUSTRIA Y COMERCIO
Radicación: 04034700 0000000
Fecha (AMD): 2004-04-15 16:27:20
Trámite: 011 PCT-PATENT 379 FASE INICI 411 PRELIMINAR
Remedios: 2000 Arreglo de Marcas, Patentes

REQUISITOS NECESARIOS PARA PRESENTACIÓN Y AGILIZACIÓN DEL TRAMITE

PATENTE DE INVENCION

MODELO DE UTILIDAD

- Indicación de que se solicita la concesión de una patente
- Datos de identificación del solicitante o de la persona que se presenta la solicitud.
- Descripción de la invención
- Dibujos de ser estos pertinentes
- Comprobante de Pago de las tasas establecidas

USUARIO

RADICADOR

COMPLETA

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INCOMPLETA

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DISEÑO INDUSTRIAL

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- Indicación de que se solicita el registro de Diseño Industrial
- Datos de identificación del solicitante o de la persona que presenta la solicitud
- Representación gráfica o fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño
- Comprobante de pago de las tasas establecidas

COMPLETA

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INCOMPLETA

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ESQUEMA DE TRAZADO

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- Indicación de que solicita el registro de un Esquema de trazado
- Datos de identificación del solicitante o de la persona que presenta La solicitud
- Representación grafica del esquema de trazado
- Comprobante de pago de las tasas establecidas

COMPLETA

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INCOMPLETA

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Firma Responsable

Carolina M. Nava

Fecha

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262

+-----+		
ACCION: Consultar Siguiente Anterior Ir al detalle Primero ...		
Seleccionar un(os) Registros		
+-----+		
SUPERINDUSTRIA Y COMERCIO		SISTEMA DE REGISTRO
Fecha 06/05/2004		
+-----+		
MANTENIMIENTO DE PROTOCOLOS		
Numero : 17397		
Fecha : 15/04/1997		
Conferido: KIMBERLY CLARK WORLDWIDE, INC.		
+-----+		
Pais : US ESTADOS UNIDOS DE AMERICA		
Ciudad : 136 NEENAH, WISCONSIN		
Represent: S Sustituir: S Desistir: S		
No. Radicacion: 97 19642 Clase: 0 Seev: 0 Seac: 0		
+-----+		
scnciaCodigo CtrNombre		
1340 A CASTRO DUQUE RAMIRO		
23002 GOMEZ MEJIA HECTOR		
+-----+		
Encontrados (1/1) registro(s)		
+-----+		

2020
Bogotá D C

Doctor(a)
RAMIRO CASTRO DUQUE.
Apoderado(a)

REFERENCIA:	Radicación N°	04-34708
	Solicitud internacional	PCT/US02/26702
	Fecha inicio fase nacional	01/06/2004
	Trámite	011
	Evento	379
	Actuación	416
	Oficio N°	639
	Folios	001

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en los artículos 26 y 27 de la Decisión 486, de la Comisión de la Comunidad Andina, y en las demás disposiciones vigentes sobre la materia, se envía el extracto de la solicitud a la oficina de comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial, conforme lo establece el artículo 40 de la Decisión 486.

Cúmplase
Dado en Bogotá D C,

10 MAYO 2004


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe División de Nuevas Creaciones.

202051