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Bogotá, Colombia S.A.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Radicación : 00076261 00000004

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Trámite : 012 PATENTES D 1 REGISTRO/ 538 PETICION

Dependencia: 2000 DIVISION DE NUEVAS CREACIONES

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AS: 83.218

Señores

**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES**

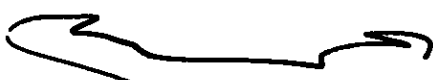
E. S. D.

REF.: Expediente No. 00 076.261 solicitud de Patente a nombre de
KIMBERLY – CLARK WORLDWIDE, INC.

RAMIRO CASTRO DUQUE, vecino de Bogotá, portador de la tarjeta profesional No. 1003 del Consejo Superior de la Judicatura, obrando como apoderado de la Sociedad **KIMBERLY – CLARK WORLDWIDE, INC.**, según lo acredita el documento de poder protocolizado en la Secretaría General bajo el No. 17397, de acuerdo con el Artículo 44 de la Decisión 486 de la Comisión de la Comunidad Andina, me permito solicitar que se examine si la invención contenida en la solicitud en referencia es patentable.

De acuerdo con lo anterior, me permito anexar el recibo oficial de caja No. 02-71,443 por valor de \$318.000.

Señor Superintendente,


RAMIRO CASTRO DUQUE
C.C. No. 170.322 de Bogotá
Código 340
T.P. No.1003 del C.S.J.
Cra. 7 No. 16-56 Piso 9

Noviembre 21, 2002
CPB/hsr



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Industria y Comercio

SUPERINTENDENCIA

NIT : 800176089-2

SUPERINTENDENCIA Y COMERCIO
Radicacion : 00076261 00000004 Folios: 2
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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

RECIBO OFICIAL DE CAJA : 02 - 71,443
FECHA : OCTUBRE 24 DE 2002

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	5163316	23/10/2002	8,834,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	85 EXAMEN DE PATENTABILIDAD DE INVEN	318,000.00
		TOTAL :	\$ 318,000.00

SON: TRESCIENTOS DIEZ Y OCHO MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

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Description

This invention relates to the fields of pharmaceutical and organic chemistry and provides novel benzothiophene compounds which are useful for the treatment of the various medical indications associated with post-menopausal syndrome, and uterine fibroid disease, endometriosis, and aortal smooth muscle cell proliferation. The present invention further relates to intermediate compounds useful for preparing the pharmaceutically active compounds of the present invention, and pharmaceutical compositions.

"Post-menopausal syndrome" is a term used to describe various pathological conditions which frequently affect women who have entered into or completed the physiological metamorphosis known as menopause. Although numerous pathologies are contemplated by the use of this term, three major effects of post-menopausal syndrome are the source of the greatest long-term medical concern: osteoporosis, cardiovascular effects such as hyperlipidemia, and estrogen-dependent cancer, particularly breast and uterine cancer.

Osteoporosis describes a group of diseases which arise from diverse etiologies, but which are characterized by the net loss of bone mass per unit volume. The consequence of this loss of bone mass and resulting bone fracture is the failure of the skeleton to provide adequate structural support for the body. One of the most common types of osteoporosis is that associated with menopause. Most women lose from about 20% to about 60% of the bone mass in the trabecular compartment of the bone within 3 to 6 years after the cessation of menses. This rapid loss is generally associated with an increase of bone resorption and formation. However, the resorptive cycle is more dominant and the result is a net loss of bone mass. Osteoporosis is a common and serious disease among post-menopausal women.

There are an estimated 25 million women in the United States, alone, who are afflicted with this disease. The results of osteoporosis are personally harmful and also account for a large economic loss due its chronicity and the need for extensive and long term support (hospitalization and nursing home care) from the disease sequelae. This is especially true in more elderly patients. Additionally, although osteoporosis is not generally thought of as a life threatening condition, a 20% to 30% mortality rate is related with hip fractures in elderly women. A large percentage of this mortality rate can be directly associated with post-menopausal osteoporosis.

The most vulnerable tissue in the bone to the effects of post-menopausal osteoporosis is the trabecular bone. This tissue is often referred to as spongy or cancellous bone and is particularly concentrated near the ends of the bone (near the joints) and in the vertebrae of the spine. The trabecular tissue is characterized by small osteoid structures which interconnect with each other, as well as the more solid and dense cortical tissue which makes up the outer surface and central shaft of the bone. This inter-connected network of trabeculae gives lateral support to the outer cortical structure and is critical to the biomechanical strength of the overall structure. In post-menopausal osteoporosis, it is, primarily, the net resorption and loss of the trabeculae which leads to the failure and fracture of bone. In light of the loss of the trabeculae in post-menopausal women, it is not surprising that the most common fractures are those associated with bones which are highly dependent on trabecular support, e.g., the vertebrae, the neck of the weight bearing bones such as the femur and the fore-arm. Indeed, hip fracture, colles fractures, and vertebral crush fractures are hall-marks of post-menopausal osteoporosis.

At this time, the only generally accepted method for treatment of post-menopausal osteoporosis is estrogen replacement therapy. Although therapy is generally successful, patient compliance with the therapy is low primarily because estrogen treatment frequently produces undesirable side effects.

Throughout premenopausal time, most women have less incidence of cardiovascular disease than age-matched men. Following menopause, however, the rate of cardiovascular disease in women slowly increases to match the rate seen in men. This loss of protection has been linked to the loss of estrogen and, in particular, to the loss of estrogen's ability to regulate the levels of serum lipids. The nature of estrogen's ability to regulate serum lipids is not well understood, but evidence to date indicates that estrogen can upregulate the low density lipid (LDL) receptors in the liver to remove excess cholesterol. Additionally, estrogen appears to have some effect on the biosynthesis of cholesterol, and other beneficial effects on cardiovascular health.

It has been reported in the literature that post-menopausal women having estrogen replacement therapy have a return of serum lipid levels to concentrations to those of the pre-menopausal state. Thus, estrogen would appear to be a reasonable treatment for this condition. However, the side-effects of estrogen replacement therapy are not acceptable to many women, thus limiting the use of this therapy. An ideal therapy for this condition would be an agent which would regulate the serum lipid level as does estrogen, but would be devoid of the side-effects and risks associated with estrogen therapy.

The third major pathology associated with post-menopausal syndrome is estrogen-dependent breast cancer and, to a lesser extent, estrogen-dependent cancers of other organs, particularly the uterus. Although such neoplasms are not solely limited to a post-menopausal women, they are more prevalent in the older, post-menopausal population. Current chemotherapy of these cancers has relied heavily on the use of anti-estrogen compounds such as, for example, tamoxifen. Although such mixed agonist-antagonists have beneficial effects in the treatment of these cancers, and the estrogenic side-effects are tolerable in acute life-threatening situations, they are not ideal. For example, these agents

may have stimulatory effects on certain cancer cell populations in the uterus due to their estrogenic (agonist) properties and they may, therefore, be contraproductive in some cases. A better therapy for the treatment of these cancers would be an agent which is an anti-estrogen compound having negligible or no estrogen agonist properties on reproductive tissues.

In response to the clear need for new pharmaceutical agents which are capable of alleviating the symptoms of, *inter alia*, post-menopausal syndrome, the present invention provides new benzothioephene compounds, pharmaceutical compositions thereof, and methods of using such compounds for the treatment of post-menopausal syndrome and other estrogen-related pathological conditions such as those mentioned below.

Uterine fibrosis (uterine fibroid disease) is an old and ever present clinical problem which goes under a variety of names, including uterine fibroid disease, uterine hypertrophy, uterine leiomyomata, myometrial hypertrophy, fibrosis uteri, and fibrotic metritis. Essentially, uterine fibrosis is a condition where there is an inappropriate deposition of fibroid tissue on the wall of the uterus.

This condition is a cause of dysmenorrhea and infertility in women. The exact cause of this condition is poorly understood but evidence suggests that it is an inappropriate response of fibroid tissue to estrogen. Such a condition has been produced in rabbits by daily administrations of estrogen for 3 months. In guinea pigs, the condition has been produced by daily administration of estrogen for four months. Further, in rats, estrogen causes similar hypertrophy.

The most common treatment of uterine fibrosis involves surgical procedures both costly and sometimes a source of complications such as the formation of abdominal adhesions and infections. In some patients, initial surgery is only a temporary treatment and the fibroids regrow. In those cases a hysterectomy is performed which effectively ends the fibroids but also the reproductive life of the patient. Also, gonadotropin releasing hormone antagonists may be administered, yet their use is tempered by the fact they can lead to osteoporosis. Thus, there exists a need for new methods for treating uterine fibrosis, and the methods of the present invention satisfy that need.

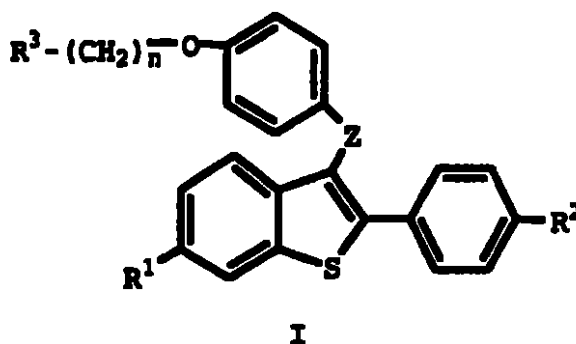
Endometriosis is a condition of severe dysmenorrhea, which is accompanied by severe pain, bleeding into the endometrial masses or peritoneal cavity and often leads to infertility. The cause of the symptoms of this condition appear to be ectopic endometrial growths which respond inappropriately to normal hormonal control and are located in inappropriate tissues. Because of the inappropriate locations for endometrial growth, the tissue seems to initiate local inflammatory-like responses causing macrophage infiltration and a cascade of events leading to initiation of the painful response. The exact etiology of this disease is not well understood and its treatment by hormonal therapy is diverse, poorly defined, and marked by numerous unwanted and perhaps dangerous side effects.

One of the treatments for this disease is the use of low dose estrogen to suppress endometrial growth through a negative feedback effect on central gonadotropin release and subsequent ovarian production of estrogen; however, it is sometimes necessary to use continuous estrogen to control the symptoms. This use of estrogen can often lead to undesirable side effects and even the risk of endometrial cancer.

Another treatment consists of continuous administration of progestins which induces amenorrhea and by suppressing ovarian estrogen production can cause regressions of the endometrial growths. The use of chronic progestin therapy is often accompanied by the unpleasant CNS side effects of progestins and often leads to infertility due to suppression of ovarian function.

A third treatment consists of the administration of weak androgens, which are effective in controlling the endometriosis; however, they induce severe masculinizing effects. Several of these treatments for endometriosis have also been implicated in causing a mild degree of bone loss with continued therapy. Therefore, new methods of treating endometriosis are desirable.

The present invention relates to compounds of formula I



wherein

R¹ is -H, -OH, -O(C₁-C₄ alkyl), -OCOC₆H₅, -OCO(C₁-C₆ alkyl), or -OSO₂(C₂-C₆ alkyl);

R² is -H, -OH, -O(C₁-C₄ alkyl), -OCOC₆H₅, -OCO(C₁-C₆ alkyl), -OSO₂(C₂-C₆ alkyl) or halo;

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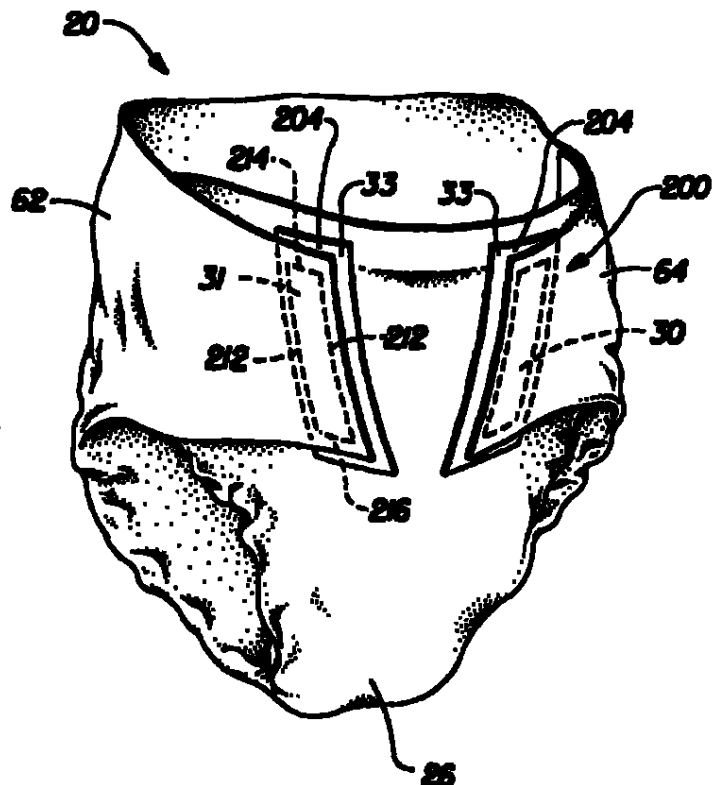
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61F 13/62, 13/15, A44B 18/00		A1	(11) International Publication Number: WO 97/36566
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(21) International Application Number: PCT/US97/04391 (22) International Filing Date: 20 March 1997 (20.03.97) (30) Priority Data: 08/627,672 2 April 1996 (02.04.96) US (71) Applicant: THE PROCTER & GAMBLE [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors: KLINE, Mark, James; 5265 Ponderosa Drive, Cincinnati, OH 45239 (US). ROBLES, Miguel, Alvaro; 785 Congress Avenue, Cincinnati, OH 45224 (US). HENRICH, Thomas; 7245 Thumbelina Lane, Cincinnati, OH 45242 (US). (74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).			(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GR, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: **ELASTOMERIC SIDE PANEL FOR USE WITH CONVERTIBLE ABSORBENT ARTICLES**

(57) Abstract

Absorbent articles such as disposable diapers, incontinent briefs, diaper holders, training pants and the like, having elastomeric ear panels and a fastening system that provides the user with different options as to how the absorbent article may be fitted to and removed from the wearer. The absorbent articles allow the wearer to choose between conventional and pull-on diaper configurations, or combinations thereof, and properly and comfortably fit a large range of wearer sizes. Further, the absorbent articles can be pulled on and/or off as a pant. This feature is provided by the ear panels which maintain sufficient tension to hold the diaper on the wearer throughout the period of use without harming the wearer's skin, while providing enough stretch to allow the diaper to be pulled up or down over the wearer's hips. The fastening system is refastenable for convenience yet strong enough to maintain the diaper in a fastened configuration without becoming detached if the diaper is pulled on or off the wearer.



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WHAT IS CLAIMED IS:

1. An absorbent article having a refastenable fastening system allowing the absorbent article to be fitted to a wearer in a conventional configuration or in a pull-on configuration, a longitudinal centerline and a lateral centerline, the absorbent article comprising:
 - a) a containment assembly having a rear waist region, a crotch region, a front waist region, a pair of longitudinal edges, a body facing surface and a garment facing surface opposite of said body facing surface, said containment assembly comprising a topsheet, a backsheet joined to said topsheet, and an absorbent core positioned between said topsheet and said backsheet;
 - b) an elastomeric first ear panel extending laterally outwardly from one of said longitudinal edges of said containment assembly in said rear waist region, said first ear panel having a proximal edge joined with said containment assembly, a distal edge spaced laterally outwardly from said proximal edge, an inner surface, and an outer surface;
 - c) an elastomeric second ear panel extending laterally outwardly from the other of said longitudinal edges of said containment assembly in said rear waist region, said second ear panel having a proximal edge joined with said containment assembly, a distal edge spaced laterally outwardly from said proximal edge, an inner surface, and an outer surface; and
 - d) a refastenable mechanical fastening system comprising:
 - i) a first closure member disposed adjacent said distal edge of said first ear panel;
 - ii) a second closure member disposed adjacent said distal edge of said second ear panel;

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said first closure member and said second closure member each having a pair of opposed longitudinal outer edges, a pair of opposed lateral outer edges, an outer region comprising said longitudinal and said lateral outer edges and a central region surrounded by said outer region, the central region having an area, said first closure member being joined to said first and said second closure member being joined to said second ear panel;

- iii) a third closure member disposed in said front waist region on said garment facing surface of said containment assembly, said third closure member being engageable with said first closure member and said second closure member so as to define a waist hoop;

the absorbent article characterized in that said first and said second closure members are joined to said ear panels with bonds arranged in a pattern having at least one edge mechanical bond in said outer region juxtaposed each of said longitudinal outer edges, said waist hoop preferably having a relaxed state circumference between about 280mm and about 360mm and a fully stretched circumference between about 550mm and about 600mm when a force less than about 2000 grams is applied.

2. The absorbent article of Claim 1 wherein said longitudinal outer edges of said first and said second closure members are disposed at an angle to said longitudinal centerline and said lateral centerline of the absorbent article.
3. The absorbent article of any of the preceding claims wherein said first and said second closure members each have a closure member major axis which is at an angle to said longitudinal and said lateral centerline of the absorbent article.

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4. The absorbent article of any of the preceding claims wherein said first and second closure members comprise at least two engaging components which preferably comprise the hook component of a hook and loop type fastener.
5. The absorbent article of any of the preceding claims wherein said third closure member comprises a landing component, which preferably comprises the loop component of a hook and loop type fastener.
6. The absorbent article of any of the preceding claims wherein said fastening system comprises adhesive fasteners, or a combination of adhesive fasteners and mechanical fasteners.
7. The absorbent article of any of the preceding claims wherein said third closure member comprises a pair of discrete fastening elements separated laterally from each other.
8. The absorbent article of any of the preceding claims further comprising a pair of front ear flaps disposed in said front waist region and extending longitudinally outwardly from said containment assembly, said front ear flaps preferably being extensible.
9. The absorbent article of any of the preceding claims further comprising a pair of front ear flaps disposed in said front waist region juxtaposed said longitudinal edges of said containment assembly, each of said front ear flaps comprising at least one fold, said front ear flaps preferably being releasably bonded in a folded configuration.
10. The absorbent article of Claim 18 wherein said first ear panel and said second ear panel each comprise a tab member which extends laterally beyond the distal edges of the ear panels; said first closure member being joined with said tab member extending from said distal edge of said first ear panel and said second closure member being joined with said tab member extending from said distal edge of said second ear panel.
11. The absorbent article of any of the preceding claims wherein said bonding pattern comprises discrete edge mechanical bonds located along both of said

longitudinal outer edges of each of said first and said second closure members, said edge mechanical bonds generally extending from one of said lateral outer edges to said opposing lateral outer edge, said mechanical bonds preferably being generally elliptical in shape having a major axis which is nonparallel to either said longitudinal outer edges or said lateral outer edges.

12. The absorbent article of any of the preceding claims further comprising center mechanical bonds located in said central region, said center mechanical bonds occupying less than about 20 percent of said area of said central region, preferably less than about 10 percent of said area of said central region, and more preferably less than about 7 percent of said area of said central region.
13. The absorbent article of any of the preceding claims wherein said waist hoop relaxed circumference is between about 280mm and about 360mm and said fully stretched circumference is between about 550mm and about 600mm when a force less than about 2000 grams is applied preferably between about 300mm and about 380mm and said fully stretched circumference is between about 600mm and about 700mm when a force less than about 2000 grams is applied, and more preferably wherein said hip hoop relaxed circumference is between about 550mm and about 750mm and said fully stretched circumference is between about 1000mm and about 1450mm when a force less than about 3000 grams is applied.
14. The absorbent article of any of the preceding claims wherein each said center mechanical bond and each said edge mechanical bond has an area and said area of each said center mechanical bond is less than about 66 percent of said area of said edge mechanical bond, more preferably less than about 25 percent of said area of said edge mechanical bond.
15. The absorbent article of any of the preceding claims wherein said waist hoop exhibits a recovery force of greater than about 250 grams when said waist hoop circumference is between about 340mm and about 390mm.

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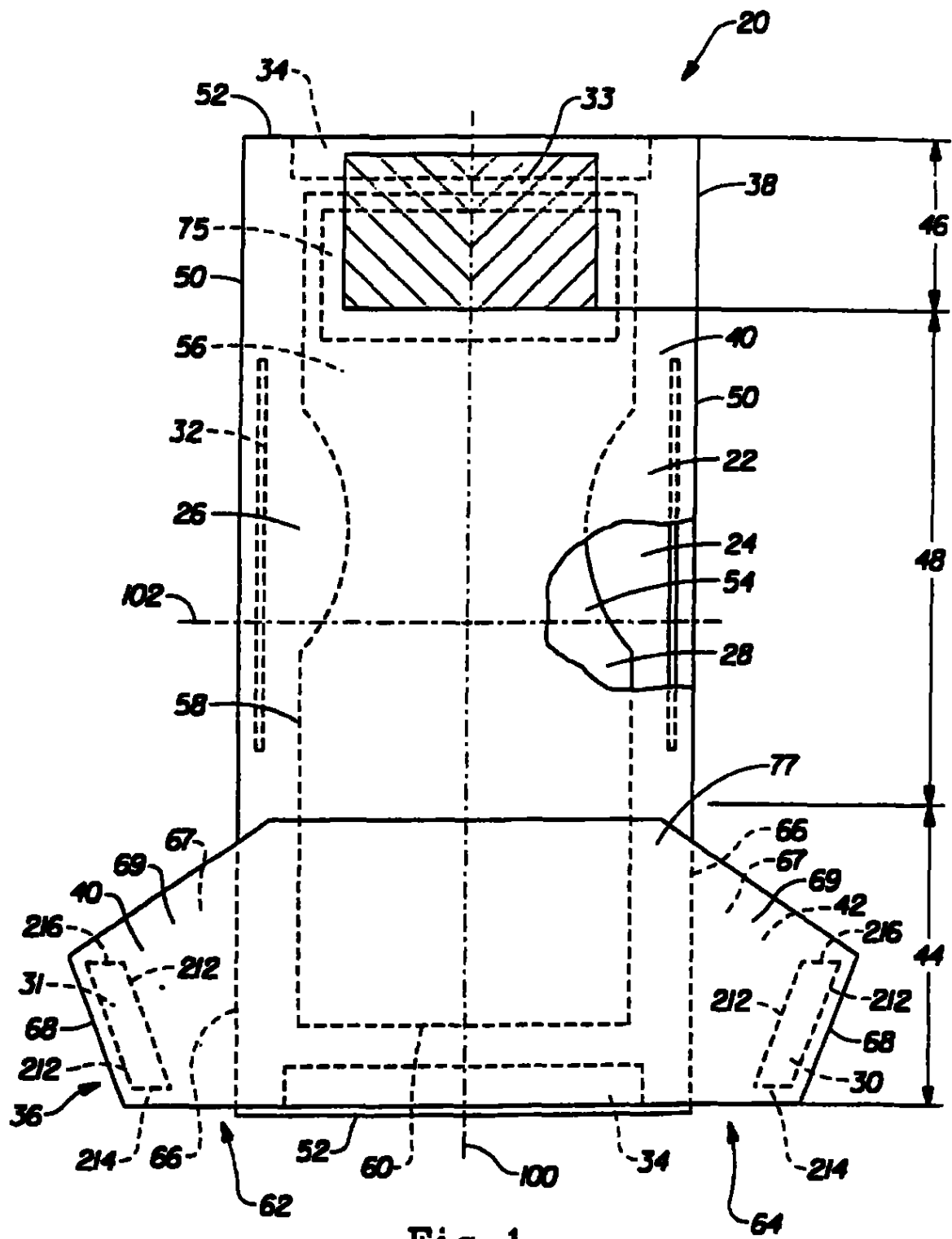


Fig. 1

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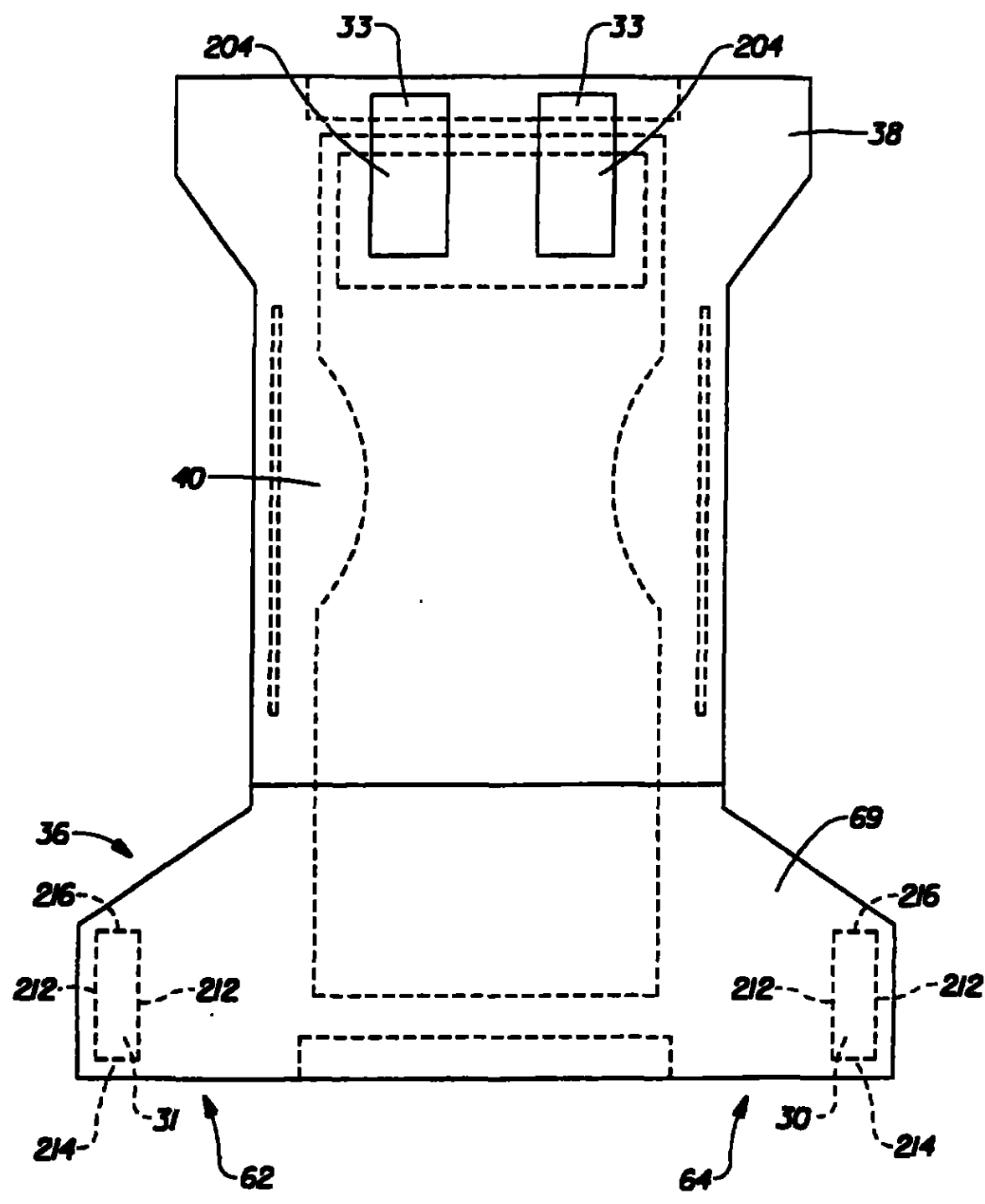


Fig. 2

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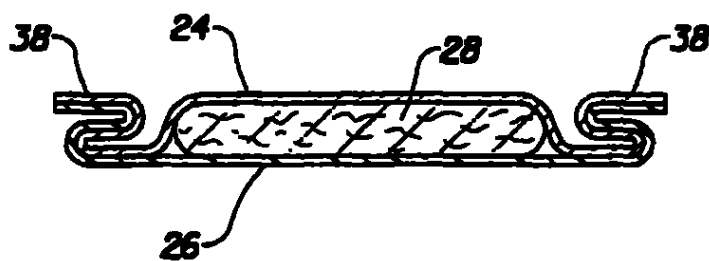


Fig. 4

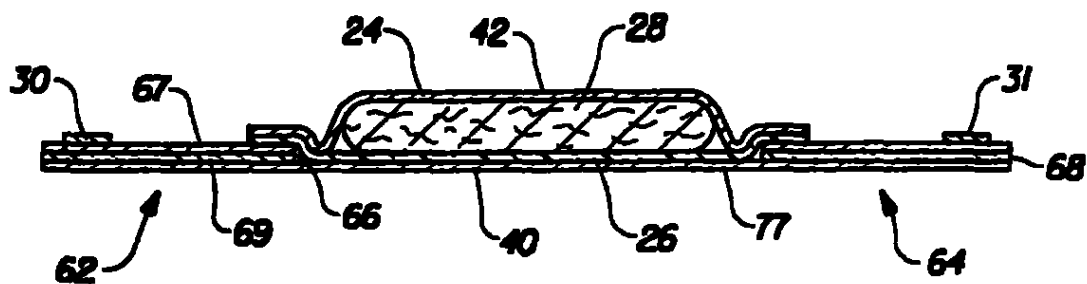


Fig. 5

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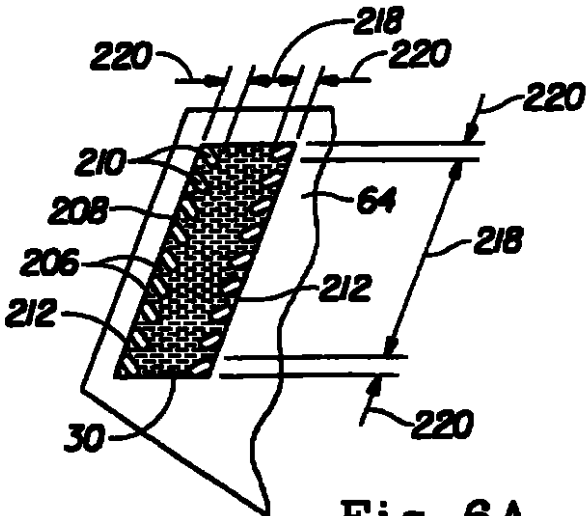


Fig. 6A

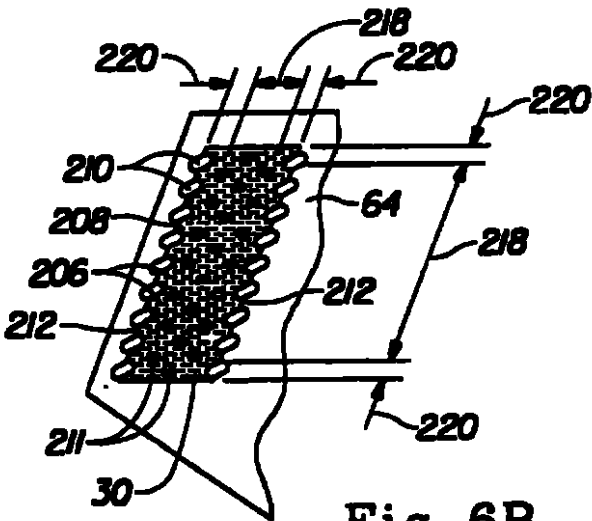


Fig. 6B

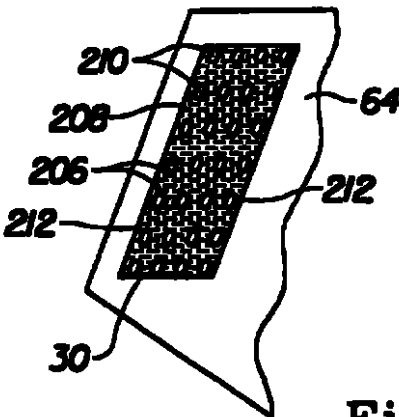


Fig. 6C

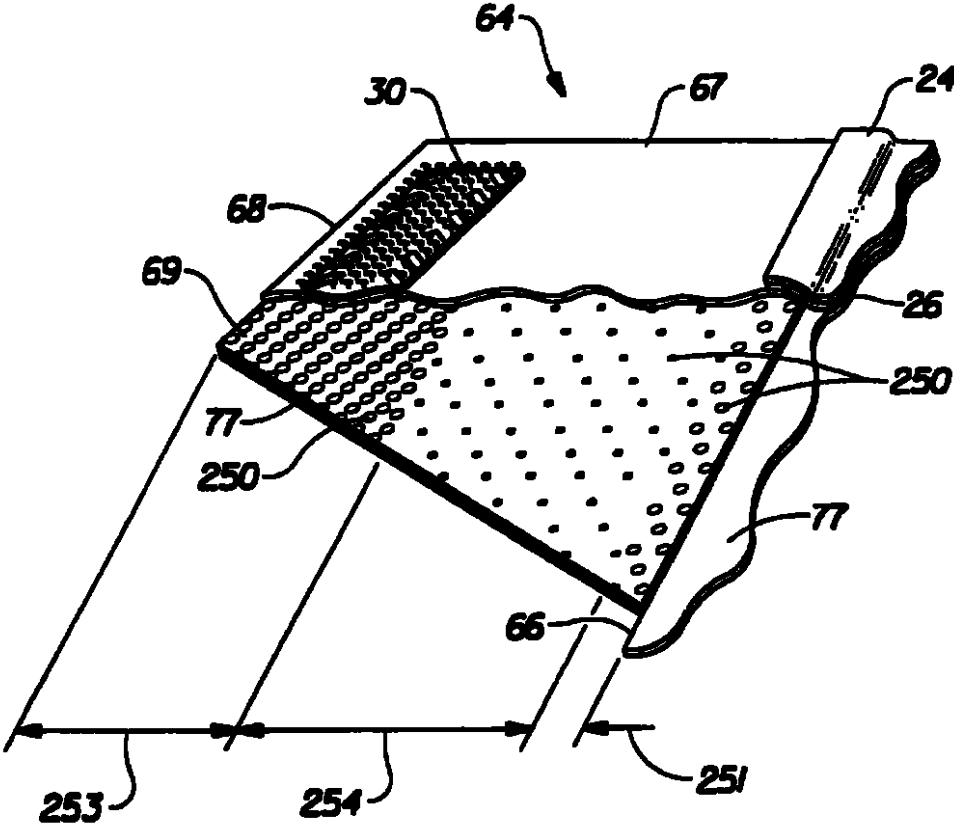


Fig. 7

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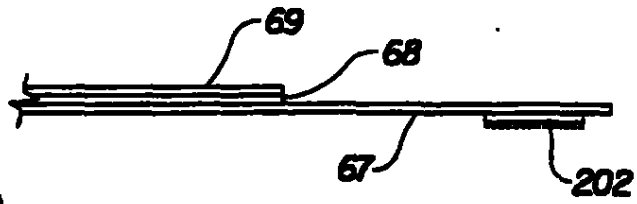


Fig. 8A

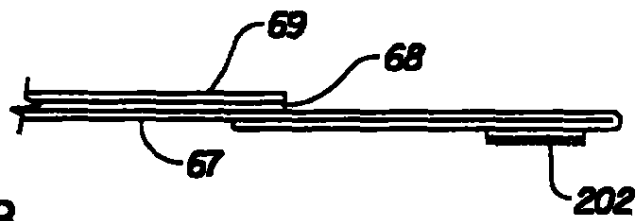


Fig. 8B

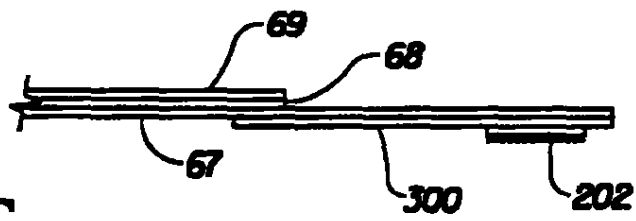


Fig. 8C

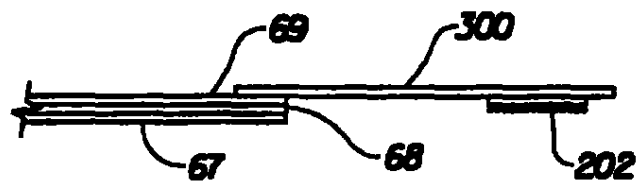


Fig. 8D

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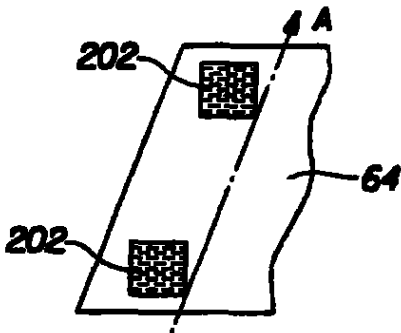


Fig. 9A

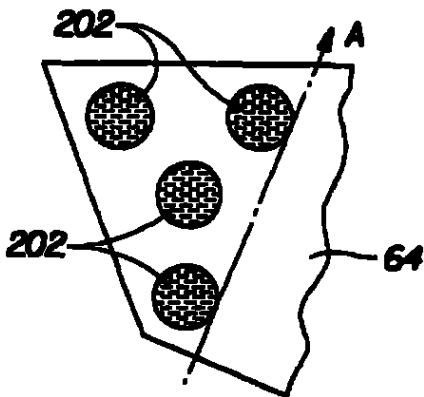


Fig. 9B

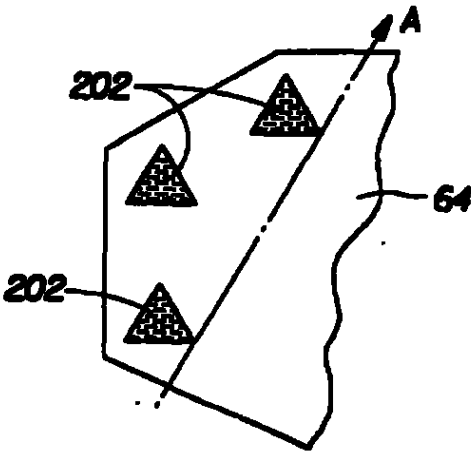


Fig. 9C

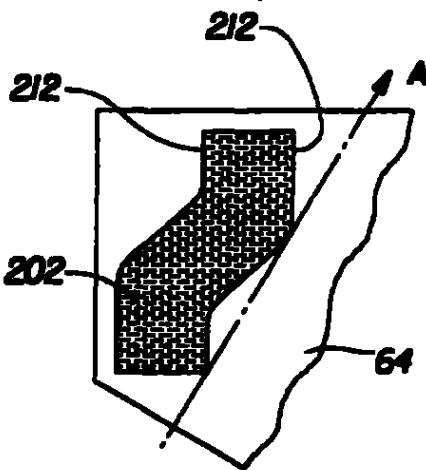


Fig. 9D

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(51) INT CL⁸

A61F 13/15 13/58

(52) UK CL (Edition N)

A3V V1B3B V6C4

(56) Documents Cited

US 5074854 A

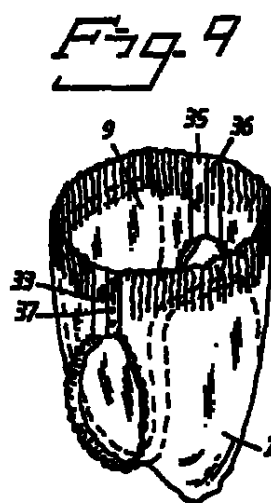
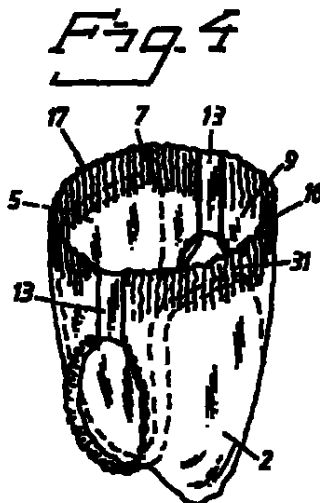
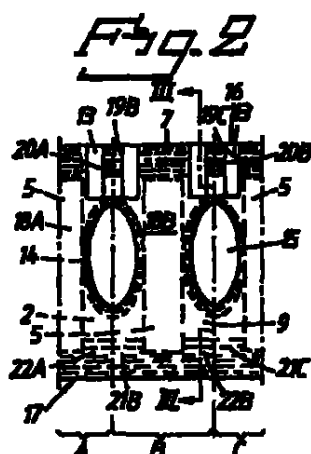
(58) Field of Search

UK CL (Edition N) A3V

INT CL⁸ A61F 13/15 13/58 13/58 13/60 13/62

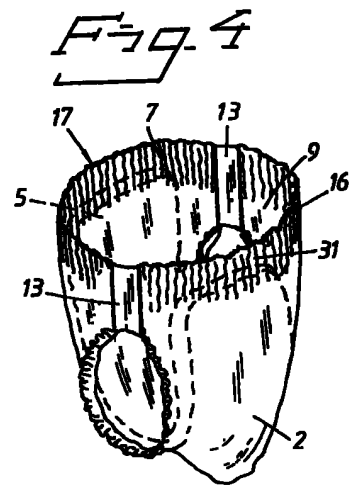
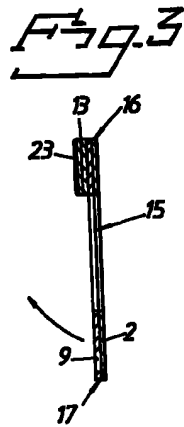
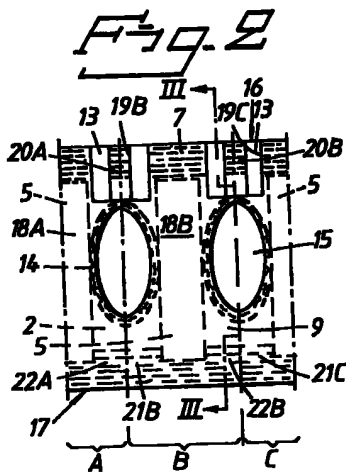
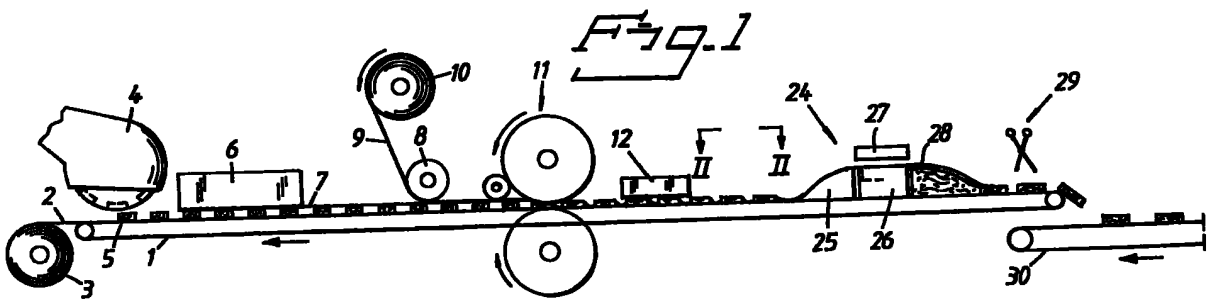
(64) Pants-type diaper or sanitary panty

(67) A pants-type diaper or a sanitary panty is manufactured by starting from a flat blank (A - C) which includes an elongated absorbent body (5) enclosed between two casing sheets (2, 9) which at opposing front and rear end parts of the absorbent body have side parts (18, 20 and 21, 22 respectively) which extend laterally beyond the body on both sides thereof, and folding the blank around a transverse axis so that the end edges (16, 17) of the side parts lie edge-to-edge. At least one folded band (13, 33, 34) of separate flexible material is placed between each pair of front and rear side parts (19, 21 and 20, 21 respectively) which lie opposite one another in the folded state of the blank, and the free ends of the bands are fastened to adjacent side parts. The bands of separate flexible material (33, 34) may be comprised of two separate parts (35, 36, 36, 39) mutually joined together by a releasable and refastenable fastener means (37).



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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Fig. 5



Fig. 6

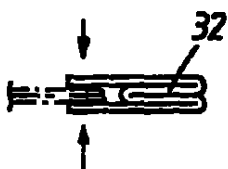


Fig. 7

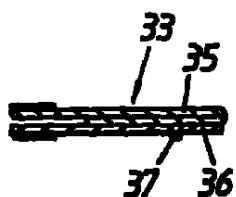


Fig. 8

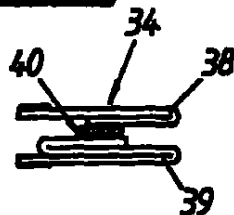
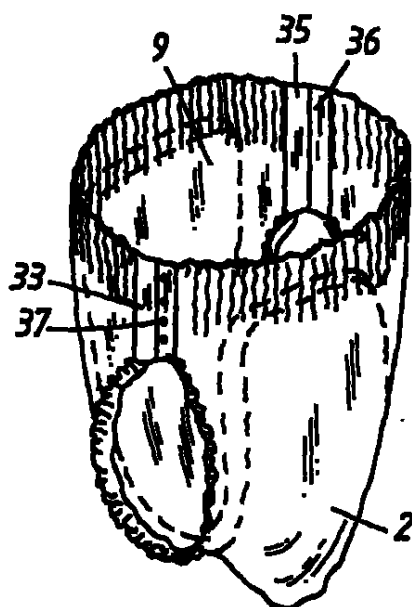


Fig. 9



**A METHOD OF MANUFACTURING A PANTS-TYPE DIAPER OR A
SANITARY PANTY, AND ONE SUCH ABSORBENT ARTICLE**

5 The present invention relates to a method of manufacturing
an absorbent article in the form of a pants-type diaper or
a sanitary panty, beginning with a flat diaper blank which
comprises an elongated absorbent body enclosed between two
casing sheets which at opposing front and rear end parts of
the absorbent body have side parts which extend laterally
10 beyond the absorbent body on both sides thereof, said
method comprising the step of folding the blank about a
transverse axis so that the end edges of said side parts
will lie edge-to-edge. The invention also relates to an
absorbent article manufactured in accordance with the
15 method.

Present-day all-in-one diapers are being replaced to an
ever greater extent with pants-type diapers, or so-called
training pants, for slightly older diaper-wearing children.
20 Pants-type diapers have a number of good features. They fit
well on the wearer, they are easy to put on and take off
with the child in a standing position, they sit firmly in
place after having been put onto a child, and conform to
the anatomy of the child as the child moves, in a comfort-
25 able fashion. Moreover, pants-type diapers resemble
conventional underpants and it is easy to understand how
they shall be used, thereby in many instances enabling
somewhat older diaper-wearing children to perform them-
selves the simple operations required in putting on the
30 pant diaper.

EP-A2-0,320,991 defines a pants-type diaper which is
produced by folding a blank of the aforesaid kind in the
manner described in the introduction, whereafter the
35 bordering side edges of the side parts are fastened
together by ultrasonic welding or gluing. A pants-type
diaper manufactured in this way will necessarily have at

least two outwardly standing side seams which, when the
diaper is worn, are subjected to loads or forces that are
directed generally at right angles to the bonded surfaces,
i.e. to so-called peel forces. Consequently, the side seams
5 must be sufficiently strong to withstand the forces to
which they are subjected, meaning that a high degree of
precision is required when joining the surfaces together
and also when selecting the materials to be joined. Neither
are the seams attractive from an aesthetic point of view,
10 which is a negative feature from a commercial aspect.

An object of the present invention is to provide a pants-
type diaper or a sanitary panty having side seams which
from a loading aspect are more advantageous than side seams
15 that are subjected to peeling forces, and which has
aesthetically attractive side parts.

This object is achieved in accordance with the invention by
means of a method of the kind defined in the introduction
20 which is characterized by placing at least one folded band
of flexible material between each pair of front and rear
side parts that lie opposite one another in the folded
state of the blank, and by fastening the free ends of the
band to respective adjacent side parts.

25 According to one preferred embodiment of the invention, the
folded bands are placed on and fastened to the front or
rear side parts of the blank prior to folding said blank,
and the band is folded in a bellows like fashion prior to
30 fastening the same to the side parts.

This method can also be applied even when the blanks form
a continuous string, i.e. prior to separating the individu-
al blanks from said string.

35 When, for reasons of a production/technical nature, the
blanks are separated individually from a continuous string

of blanks prior to bringing the side parts together, it is proposed in accordance with the invention that a method of the kind defined in the introduction will include the characterizing steps of folding at least one band of flexible material around each pair of the front and rear side parts of the web which oppose one another in the folded state of said web, and by fastening the free ends of the band to its adjacent side part.

The invention also relates to an absorbent article in the form of a pants-type diaper or sanitary panty, which comprises an elongated absorbent body enclosed between two casing sheets which have at opposing front and rear end parts of the absorbent body side parts which extend laterally beyond said body on both sides thereof, wherein the opposing front and rear side parts are mutually joined, characterized in that a separate piece of material extends between each pair of mutually opposing front and rear side parts and forms a join between these side parts such that said join will be subjected essentially to shear forces when the article is worn.

According to one preferred embodiment of the invention, the pieces of material joining the side parts are generally non-elastic and the separate pieces of material are attached to the inner surfaces of the side parts. The separate pieces of material are comprised of two separate parts which are joined together by a releasable and refastenable fastener means, for instance in the form of a row of press studs, projections and recesses, mutually coacting hooks and eyes, adhesive coatings or self-fastening or hook and loop fasteners.

The invention will now be described in more detail with reference to the accompanying drawings, in which

Figure 1 illustrates schematically a plant machinery for manufacturing a pants-type diaper in accordance with the invention and by means of an inventive method;

5 Figure 2 illustrates from above a part of the web shown in Figure 1 in a manufacturing stage immediately prior to folding and joining together the blanks to form pants-type diapers;

10 Figure 3 is a sectional view taken on the line III-III in Figure 2;

Figure 4 is a perspective view of a pants-type diaper manufactured in accordance with the inventive method;

15 Figure 5 illustrates a bellows-folded band suitable for application on an inventive pants-type diaper blank manufactured by means of the transverse production method, i.e. the absorbent bodies have been placed on a moving web
20 of material with the longitudinal axes of the bodies extending at right angles to the direction of web movement;

Figure 6 illustrates a bellows-folded band suited for application on an inventive pants-type diaper blank
25 manufactured in accordance with the longitudinal production method, i.e. the absorbent bodies have been placed on a moving web of material with the longitudinal axes of the bodies extending parallel with the direction of web movement;

30 Figures 7 and 8 illustrate folded bands which include releasable and refastenable fastener means, suitable for application on an inventive pants-type diaper blank; and

35 Figure 9 illustrates in perspective a second embodiment of a pants-type diaper which includes the bands of Figure 7 in its side parts.

Figure 1 illustrates schematically the plant machinery for manufacturing pants-type diapers, including a conveyor path 1 by means of which casing material 2 taken from a storage reel 3 is conveyed from left to right in Figure 1. Located downstream of the reel 3 is a device 4 which lays absorbent bodies 5 at regular intervals on the underlying web of casing material 2. Located downstream of the device 4 is a device 6 which lays elastic elements in a specific pattern onto or immediately above the web of casing material 2. These elastic elements, of which one 7 is shown schematically in Figure 1 and which are preferably comprised of elastic threads or ribbons, form the waist and leg elastic of the manufactured pants-type diaper. Located downstream of the device 6 are guide rollers 8 which function to guide a second web of casing material 9 onto the first web 2, while downstream of the guide rollers 8, there is located a device 11 which brings the webs of casing material together and fastens the webs to one another at those parts thereof which lie outside the absorbent bodies 5. The plant machinery hitherto described functions in the same way as the plant machinery used to manufacture conventional all-in-one diapers and the composite product leaving the device 11 will be comprised of a continuous string of pants-type diaper blanks which, similar to the all-in-one diapers produced in conventional plants, includes an absorbent body which is enclosed between two casing sheets and also elastic elements. At this stage of manufacture, the pants-type diaper blank differs from a typical diaper blank mainly in that the waist elastic has a different form to the waist elastic with which a diaper blank may be provided, as will be made more apparent in the following. The devices 4, 6, 8 and 11 are preferably known devices suitable for producing a pants-type diaper blank of the aforesaid kind. Since a detailed description of the construction of these devices is not needed to acquire an understanding of the invention, the devices will not be further described.

Located downstream of the device 11 is a device 12 which functions to attach folded bands 13 to the underlying moving web of mutually connected blanks. The device 12 will preferably include plungers that are operative in pressing glue-coated bands 13 against the casing sheet 9.

Figure 2 illustrates from above a section of the web of mutually joined blanks subsequent to the web exiting from the device 12. The section illustrated in the Figure includes a complete pants-type diaper blank B and parts of two mutually adjacent blanks A and C. As will be seen from the Figure, the device 6 lays-out a plurality of elastic threads 7 which extend sequentially in the transverse direction of the blank and which form the waist elastic of a manufactured pants-type diaper, and also lays-out around openings 15 cut from the web elastic threads 14 which form the leg elastic of a manufactured pants-type diaper. The openings are preferably cut from the web when joining the casing sheets together with the aid of some appropriate means, for instance by means of a punch included in the device 11 or located immediately downstream thereof.

The blanks A, B, C include a front edge 16, a rear edge 17, a central part 18 delimited by the opposing long edges of the absorbent body 5 and the extensions of said long edges, front side parts 19, 20 on both sides of the central part 18, and rear side parts 21, 22 which are delimited by the respective front edge 16 and rear edge 17, the openings 15 lying on respective sides of the central part, and the imaginary separation lines between the individual blanks A, B and C, which are shown in dash-dotted lines in Figure 2. When applicable, the parts 19-22 of the various diapers have been further identified in Figure 2 with the aid of suffixes A-C, in order to clearly distinguish between corresponding parts of different blanks. As shown in Figure 3, the bands 13 attached to the side parts 19, 20 are single-folded and are disposed with respective folds

extending parallel with the side edges of the side parts, so that those edges of the band that are folded towards one another in said side parts will face one another.

5 Pants-type diapers are produced from the blanks shown in Figures 2 and 3, simply by folding the blanks in the direction indicated by the arrow in Figure 3, so that the edges 16 and 17 will lie opposite one another, and by fastening the casing sheet 9 to the bands 13 in conjunction
10 therewith. Glue beads 23 are suitably applied to the single-folded bands 13 in conjunction with bringing the edges 16, 17 together. Naturally, the glue beads may instead be applied to the casing sheet 9 on the rear side parts 21, 22 prior to folding the blanks.

15 The plant illustrated in Figure 1 includes downstream of the device 11 a device 24 by means of which the web of blanks is folded together and the front and rear side parts of the blanks are joined to one another. The device 24 may
20 include fixed guide means 25 having mutually successively converging side walls, plunger means 26 which intermittently press the rear side parts of the blanks against the front side parts thereof, applicator means 27 for applying glue to the folded bands or to the rear side
25 parts, and fixed guide means 28 having side walls which successively diverge from one another.

30 The web moving through the guide means 28 is thus comprised of a string of mutually joined pants-type diapers which after exiting from the guide means 28 are separated from one another by means of an appropriate cutting tool 29 and conveyed by suitable conveying means 30 to a packaging station.

35 Figure 4 is a perspective view of a pants-type diaper manufactured in accordance with the aforescribed method. A pants-type diaper is intended to be put on in the same

way as a pair of underpants and is characterized by an elasticated waist part which can be stretched so that the diaper can be drawn readily over the wearer's hips when putting on or taking off the pant diaper, and the elasticity of which is such that a worn pant diaper will be held securely in position by the contraction forces acting in the waist part of the diaper. In order to fulfil these functional requirements while, at the same time, restricting the number of production sizes, the pants-type diaper will preferably have a stretch which is greater than 80%, i.e. the circumference of the waist part shall be 1.8 times the extension of the circumference of the waist part of a removed pant diaper in a non-stretched state. The total contraction force in the waist part, i.e. the sum of the force contributed by elastication provided in the front part, the rear part and the side parts, will preferably exceed 3 N.

The pants-type diaper illustrated in Figure 4 is constructed in the same way as the pants-type diaper described in Swedish Patent Application No. 9200663-4, and includes an absorbent body 5 enclosed between an inner and an outer casing sheet 9 and 2 respectively. The inner casing sheet 9 is liquid-permeable and is comprised, for instance, of nonwoven material compiled from fibres of polyethylene, polypropylene, polyester or mixtures thereof. Viscose fibres may also be used. It is also conceivable to form the inner casing sheet from a perforated plastic sheet, for instance a perforated polyethylene sheet. The outer casing sheet 2 is liquid-impermeable or at least hydrophobic and may, for instance, comprise a sheet of polyethylene or nonwoven material which has been coated with or laminated with polyolefins, so as to be made liquid-impermeable or at least hydrophobic. For aesthetic and psychological reasons, the outer casing sheet 2 may be comprised of two layers, an inner liquid-impermeable layer and a layer of fabric-like material disposed outside the inner layer. The wearer will

then see and feel the pant diaper as a fabric garment rather than as a plastic garment. When the outer casing sheet has this latter construction, it is not necessary for the liquid-impermeable sheet to have the same extension as the fabric-like sheet, but may be smaller than said sheet, for instance liquid-impermeable casing material can be omitted from the side parts of the pant diaper.

The absorbent body 5 may contain cellulose fluff pulp with or without an admixture of particles of so-called superabsorbent material and/or thermoplastic melt fibres, and may be comprised of one or more layers.

The waist part 41 of the pants-type diaper illustrated in Figure 4 includes a plurality of sequentially mounted elastic threads 7, each of which extends transversely around the circumference of the waist part. In this way, there is formed a relatively broad elastic waist part. As will be understood, elastic ribbons, bands or the like may be used instead of elastic threads, or other elastically stretchable material can be used, such as elastically stretchable plastic film, an elastically stretchable nonwoven material, or like material.

Similar to a pair of underpants, the pants-type diaper illustrated in Figure 4 has a waist opening and two leg openings, which are provided with leg elastic in a conventional manner. The pant diaper is put on by inserting the legs of the wearer through the leg openings and then drawing the pant diaper up over the wearer's hips. The contraction forces exerted by the elastic elements at the waist opening, i.e. at the uppermost part of the waist part 41, are preferably greater than the contraction forces exerted in the remainder of the waist part. This will ensure that the pant diaper will remain seated in its intended position, even when the absorbent body is full of urine.

Thus, when the pants-type diaper is worn, the join between the bands 13 and the casing sheet 9 will be affected essentially only by forces that act in the circumferential direction of the waist part, said joins therewith solely being subjected to shear forces. As a result of the construction of the inventive pant diaper, the joins will not be subjected to peeling forces that are unfavourable from a loading aspect. Consequently, the requirements placed on the properties of these joins are much less stringent than the requirements placed on the joins of known pants-type diapers. The joins produced by the inventive method are also attractive from an aesthetic aspect and fulfil the purpose of imitating conventional underpants in a much better manner than the earlier known pants-type diapers.

The inventive method also provides certain technical manufacturing advantages over the known method of joining together the side parts of a pants-type diaper taught by the aforesaid EP-A2-0,320,991. When manufacturing the known pants-type diaper, a greater degree of precision is required when joining the edges of the side parts together, both with regard to folding the blanks so that the side edges of the front and rear side parts will lie edge-to-edge, and with regard to the actual joining process, in which a welding or gluing unit must be guided with the same precision. When practicing the inventive method, it is immaterial from a functional aspect whether or not the bands are slightly displaced from their intended position on the front side parts when mounting the bands on the underlying web or string of blanks, or whether or not the glue beads 23 (Figure 3) are slightly displaced laterally from their intended position subsequent to said application, provided of course that the bands are dimensioned to permit such deviations. The same advantages are, of course, obtained when other methods, such as ultrasonic or heat-sealing methods are used to fasten the bands and

casing material together instead of glue. Because the joins are only subjected to shear forces, there is a greater freedom in the type of join chosen, for instance the join used may be a mechanical join of a self-fastening type.

5

Another advantage is that the circumferential extension of the bands 13 can be varied to a large extent, and if desired this extension can be made sufficiently large to enable the side parts of the diaper to be comprised almost completely of said bands. This construction will reduce the wastage of casing material, since the lateral extension of the openings 15 in the string or web of blanks will be reduced to a corresponding extent. However, in the case of this construction, it is not possible to attach the bands in a single-folded state to the pants-type diaper blank, since the bands would then be severed when cutting the individual blanks from the blank string. In order to enable bands of greater extension in the circumferential direction of the manufactured diaper to be applied, it is necessary to fold the bands in a bellows fashion prior to application, so as to restrict the extension of the bands in the transverse direction of the blanks. Figure 5 illustrates an example of a bellows-folded band 31 which can be applied to a pants-type diaper blank in the same way as the bands 13.

25

The aforescribed method of mounting the bands on the side parts of a pants-type diaper blank can be applied in both transverse and longitudinal production of pants-type diapers, although with the difference that in the case of longitudinal production, it is necessary to cut the individual blanks from the blank string prior to folding the rear side parts onto the front side parts.

30

When the blanks are advanced in the form of individual blanks, the bands can be applied to the casing sheet 2 instead of to the casing sheet 9, by first fastening one free end of the bands to the front side parts of the blank,

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and thereafter folding the blank. The bands, which are initially not folded and flat, are then folded in over the rear side parts of the folded blank and fastened thereto. Naturally, it is also possible to apply the flat bands to the front side parts of the individual, flat blanks, whereafter the blank and then the bands are folded, wherewith the bands will be attached to the inner surfaces of the front side parts and the outer surfaces of the rear side parts.

In this regard, it is pointed out that the bands may, of course, be fastened to the front and the rear side parts in a reverse manner to that described, i.e. the bands may be first fastened to the rear side parts and then to the front side parts.

Figure 6 illustrates a band 32 which can be fastened to a ready folded blank, by passing the blank side parts that have been folded onto one another between the free edges of the band 32 and pressing these edges firmly onto the side parts, by application of an external force.

According to one variant of the method described with reference to Figures 1-4, the folded bands can be passed in between the front and the rear side parts during the final stage of folding the blanks and fastened thereto in one single stage.

As mentioned in the foregoing, pants-type diapers have a number of good features, but also some drawbacks. It is difficult to change a pants-type diaper with the wearer in a lying position, and requires the removal of a garment worn outside the pant diaper when making the change. Neither can a used pants-type diaper be rolled up and sealed in the same way as an all-in-one diaper. Furthermore, the diaper wearer is liable to be dirtied when removing a used pant diaper containing feces.

These drawbacks can be overcome in a particularly simple way with an inventive pants-type diaper, simply by using bands that are comprised of two parts which are joined together by means of a releasable and refastenable fastener means. Figures 7 and 8 are respective cross-sectional and side views of two such bands 33 and 34, while Figure 9 illustrates a pants-type diaper provided with a band 33. The band 33 is comprised of two parts 35, 36 which are mutually joined by a row of projections 37 projecting from the part 35 and passing through a row of openings formed in the part 36. This enables the pants-type diaper illustrated in Figure 9 to be removed and replaced without needing to fully remove trousers, pants or like garment worn outside the pant diaper, by loosening the band parts 35, 36 from one another so that either the rear part or the front part can be passed between the legs of the wearer. A replacement pants-type diaper can thereafter be put on by loosening the band parts of said pants-type diaper from each other, whereafter the front or rear part of the replacement pants-type diaper is inserted between the legs of the wearer. The two band parts are then fastened together, by inserting the row of projections on one band part through the row of openings in the other part, whereafter the pants-type diaper is drawn up to its correct wearing position in the same way as a pair of underpants, unless this has already been done when refastening the replacement pant diaper.

Figure 8 illustrates schematically a band 34 which is comprised of two parts 38, 39 which are mutually joined by means of a mechanical fastener means 40, for instance a self-fastening or hook and loop band. The fastening means illustrated in Figures 7-9 merely represent examples of suitable fastener devices and it will be understood that the pants-type diaper shown in Figure 9 can be provided with a number of other types of fasteners lying within the expertise of a normal person skilled in this art. For instance, adhesive fasteners can be used, and also other

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types of mechanical fasteners other than those described, such as buttons and buttonholes, hooks and eyes, etc.

Although the invention has been described and illustrated solely with reference to pants-type diapers, it will be understood that the invention can also be applied to sanitary panties, i.e. panties in which absorbent bodies for absorbing menstrual fluids or light incontinence discharges are integrated.

It will be understood that the described embodiments can be modified within the scope of the invention. For instance, the absorbent body may have a form different to that described and may include several layers, which in turn means that the described plant for manufacturing pants-type diapers in accordance with the invention will be modified correspondingly. Furthermore, the pants-type diaper blanks can be folded and the front and rear side parts of the blanks brought together with the aid of means other than those described. The individual pants-type diapers can be cut from the continuous web of blanks in conjunction with bringing the front and the rear side parts of the blanks together, instead of in a separate following stage. Furthermore, more than one band can be used to fasten the mutually opposing front and rear side parts. The invention is therefore restricted solely by the scope of the following Claims.

CLAIMS

1. A method of manufacturing an absorbent article in the form of a pants-type diaper or a sanitary panty, starting from a flat blank (A-C) which includes an elongated absorbent body (5) enclosed between two casing sheets (2, 9) which at opposing front and rear end parts of the absorbent body have side parts (19, 20 and 21, 22 respectively) which extend laterally beyond the body on both sides thereof, said method comprising the step of folding the blank around a transverse axis so that the end edges (16, 17) of the side parts lie edge-to-edge, characterized by placing at least one folded band (13) of flexible material between each pair of front and rear side parts (19, 21 and 20, 22 respectively) which oppose one another in the folded state of the blank, and by fastening the free ends of said bands to adjacent side parts.

2. A method according to Claim 1, characterized by placing the folded bands (13) and fastening said bands to the front or the rear side parts (19, 20 and 21, 22 respectively) prior to folding the blank (A-C).

3. A method of manufacturing an absorbent article in the form of a pants-type diaper or a sanitary panty, starting from a flat blank which comprises an elongated absorbent body enclosed between two casing sheets which at opposing front and rear end parts of the absorbent body have side parts which extend laterally beyond the body and on opposite sides thereof, wherein the blank is folded about a transverse axis so that the end edges of the side parts lie edge-to-edge, characterized by folding at least one band of flexible material about each pair of front and rear side parts which oppose one another in the folded state of the blank, and by fastening the free ends of the bands to adjacent side parts.

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4. A method according to any one of the preceding Claims, characterized by folding the bands (31, 32) in a bellows-like fashion prior to their attachment to the side parts.

5. An absorbent article in the form of a pants-type diaper or sanitary panty, comprising an elongated absorbent body (5) enclosed between two casing sheets (2, 9) which at opposing front and rear end parts of the absorbent body have side parts (19, 20 and 21, 22 respectively) which extend laterally beyond said body on both sides thereof, wherein opposing front and rear side parts (19, 21 and 20, 22 respectively) are joined together, characterized in that a separate piece of material (13) extends between each pair of opposing front and rear side parts (19, 21 and 20, 22 respectively) and forms a join between these side parts such that said join will be subjected essentially to shear forces when the article is worn.

6. An article according to Claim 5, characterized in that the pieces of material (13) joining the side parts are essentially non-elastic.

7. An article according to Claim 5 or 6, characterized in that the separate pieces of material (13) are joined to the inner surfaces of the side parts (19-22).

8. An article according to Claim 5 or 6, characterized in that the separate pieces of material (32) are joined to the outer surfaces of the side parts (19-22).

9. An article according to Claim 5 or 6, characterized in that each separate piece of material is joined to the inner surface of one of the front or rear side parts and to the outer surface of the other front or rear side part.

10. An article according to any one of Claims 5-9, characterized in that the separate pieces of material (33;

34) are comprised of two separate parts (35, 36; 38, 39) which are mutually joined together by a releasable and refastenable fastener means.

- 5 11. An absorbent article according to Claim 10, characterized in that the fastener means comprises a row of press studs.
- 10 12. An absorbent article according to Claim 10, characterized in that the fastener means is comprised of projections (37) which project from one (35) of the separate parts of said piece and which pass through openings in the other (36) of the separate parts of said piece.
- 15 13. An absorbent article according to Claim 10, characterized in that the fastener means is comprised of mutually coacting hooks and eyes.
- 20 14. An absorbent article according to Claim 10, characterized in that the fastener means is comprised of adhesive coatings.
- 25 15. An absorbent article according to Claim 10, characterized in that the fastener means is comprised of a self-fastening or hook and loop band (40).
16. A method according to Claim 1 substantially as hereinbefore described with reference to any one of Figures 1 or 2 of the accompanying drawings.
17. An absorbent article as claimed in Claim 5 substantially as hereinbefore described with reference to and as illustrated in any one of Figures 4 or 9 of the accompanying drawings.

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(51) INT CL⁶

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(52) UK CL (Edition O)

A3V V1B3B V52 V8A1

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(58) Field of Search

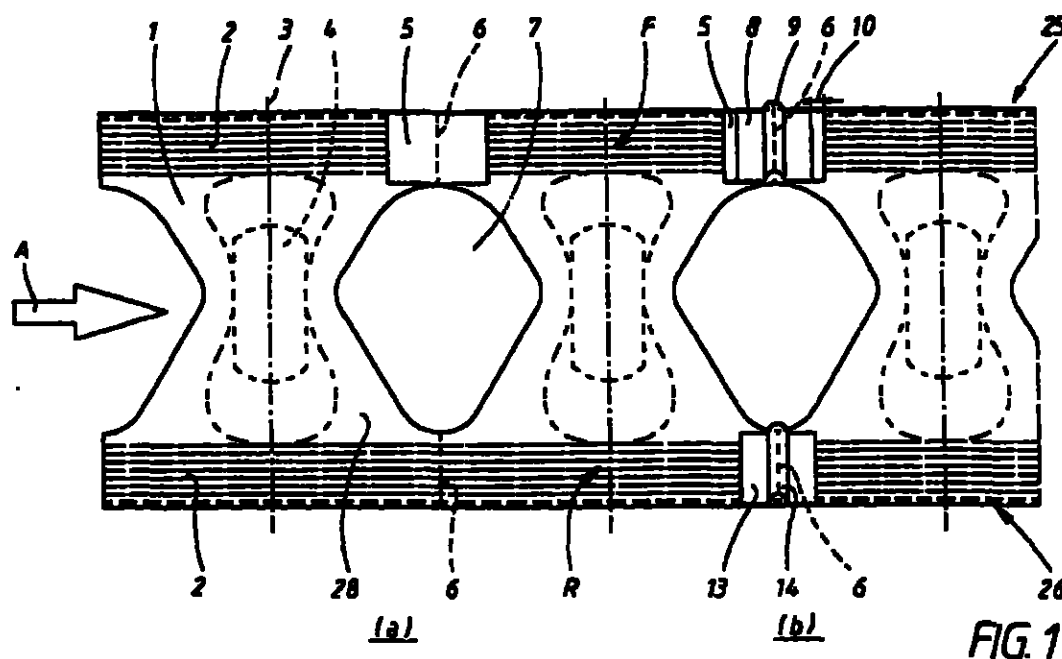
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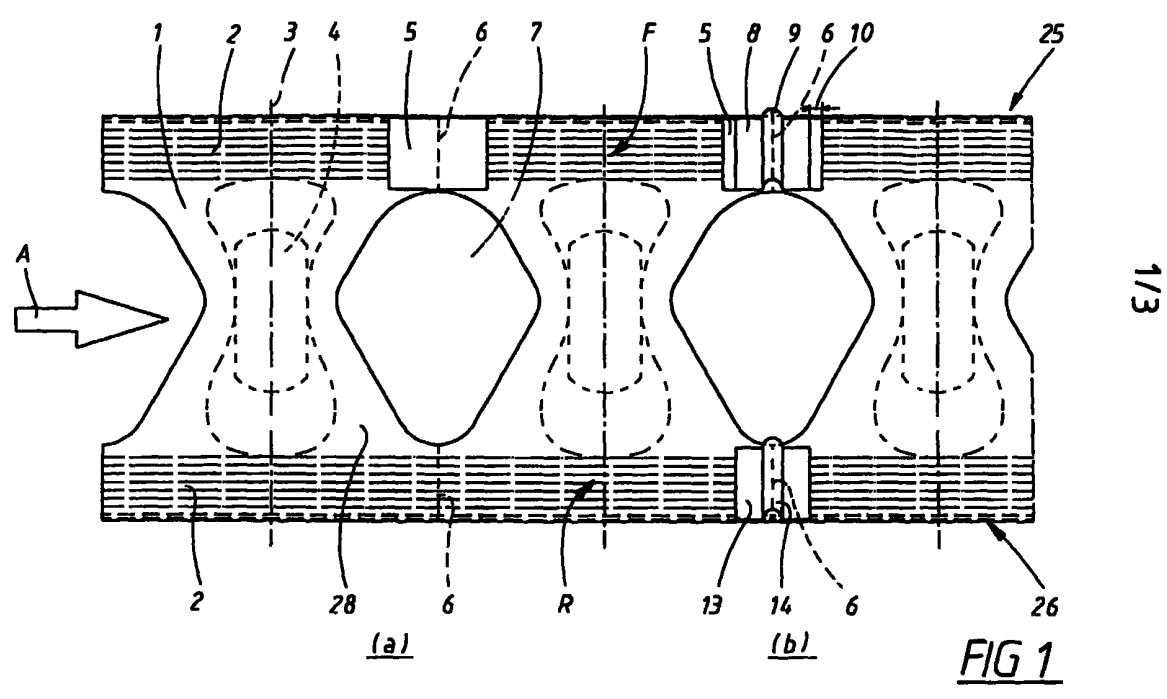
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(54) **Reclosable absorbent garments**

(57) An in-line method for producing reclosable absorbent garments, in particular pants, comprises a continuous web (1) of connected absorbent articles delimited from one another by a line of weakening (6). A first strip (8) comprising releasably attachable material is applied across the line (6) at one edge (25) of the web (1). A second strip of flexible material (13) is also applied across the line (6) at the other edge (26) of the web (1). Both strips (8, 13) are attached in such a way so as to leave a surplus of material positioned above the line (6). The web is then folded longitudinally (figure 2) and adjacent articles are separated at line (6). However, due to the surplus of material, the strips (8, 13) are not ruptured and they provide a zone between the separated edges of each article. The strips (8, 13) are then joined together across the zone to form a plurality of joined garments. The strips (8, 13) may then be severed so as to form individual garments that are adjustable by means of the strips (8, 13), or they may be provided with a line of weakening for later separation.



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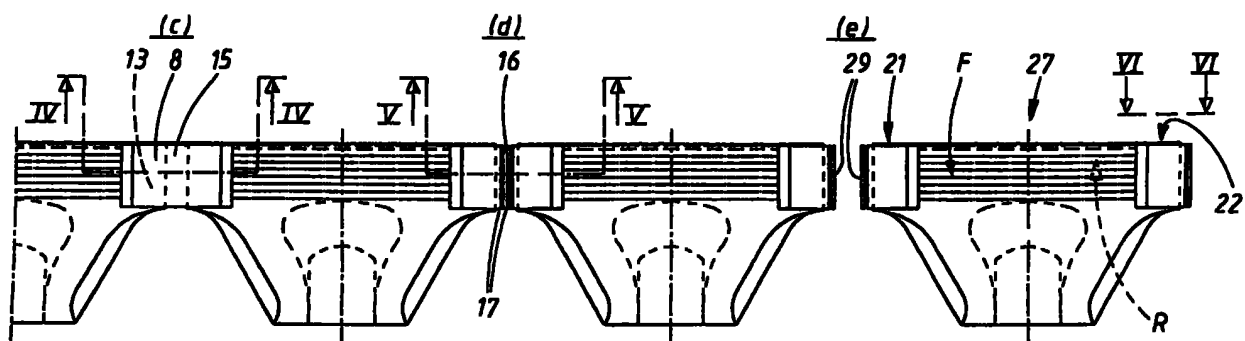


FIG. 3

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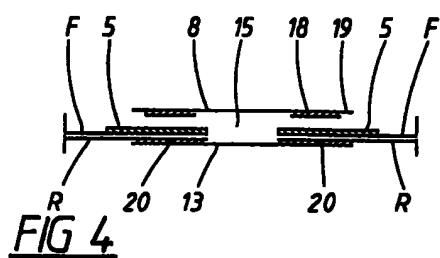


FIG. 4

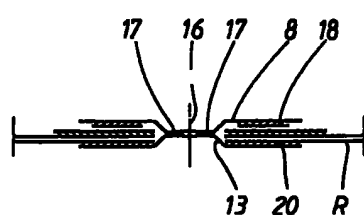


FIG. 5

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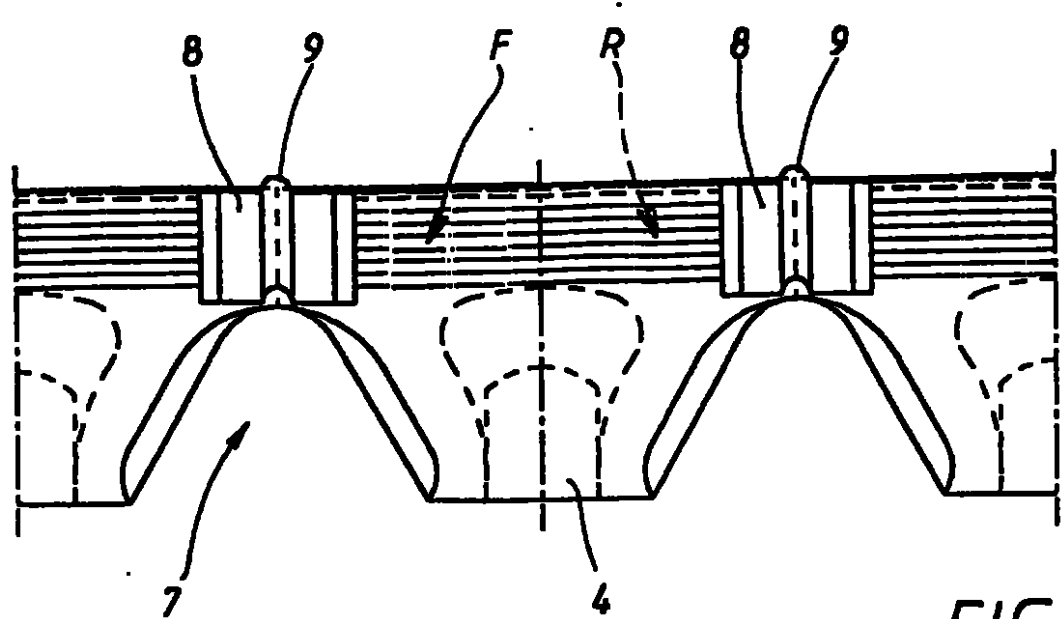


FIG. 2

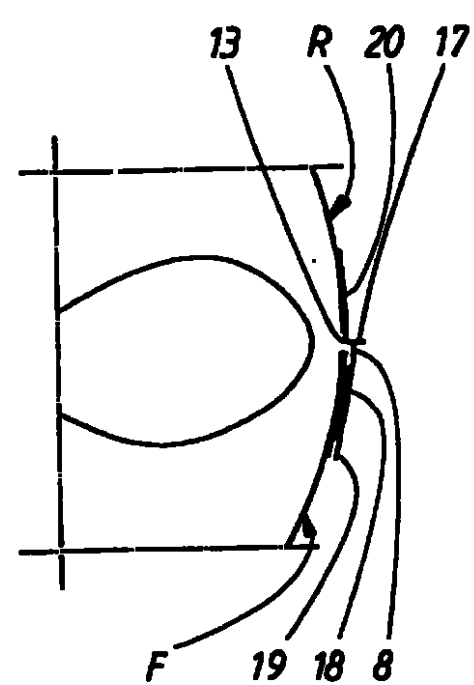


FIG. 6

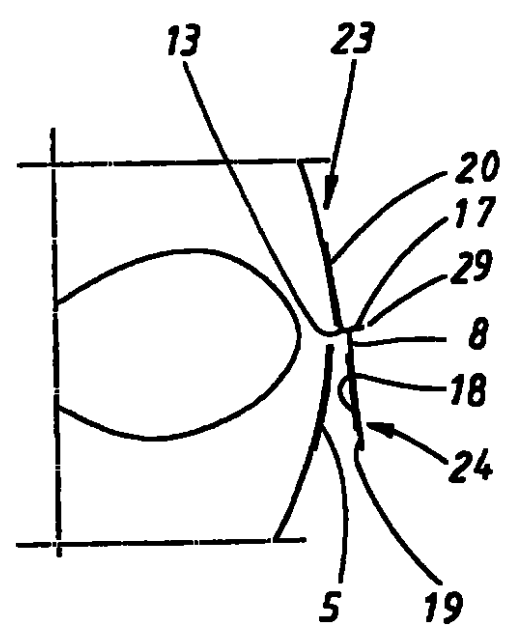


FIG. 7

Title: Method of producing reclosable absorbent garments and absorbent garments obtained thereby

5 Field of the invention:

The invention relates to a method of producing reclosable absorbent garments. The invention also relates to an absorbent garment as defined in the first part of claim 7, and to a series of closed absorbent garments.

Background to the invention

10 Absorbent garments of the reclosable type are known. One such garment is for example a nappy for use by a child or adult incontinent users, said nappy having strips with tabs on one end of said product that can be releasably adhered to a landing zone on the other end of said product when fitted to a baby/child user. One problem with this is however that for putting the garment on, some dexterity is
15 required to grip and position the tab. In older users, such dexterity is often lacking and the garments may be particularly awkward to assemble.

Another type of absorbent product that has been used much in recent years, and which circumvents such problems, is an absorbent garment known generally as a pair of training pants or incontinence pants. The garment is much more convenient and
20 quicker to put on than a reclosable nappy, since it is very similar to a pair of ordinary underpants in that it has a continuous waistband and two leg openings. This form allows it to be pulled on like normal pants without any pre-assembly. When the garment becomes soiled however, its removal is problematic. Either the outer clothing has to be removed entirely to take the pants off as normal, which can be
25 difficult in many situations, or the two sides of the pants have to be torn vertically so that the torn garment can be removed between the wearer's legs. The tearing of the side portions in itself can however be difficult, especially again for very old wearers who may lack the strength to tear the product.

A further problem which presents itself is that absorbent pants cannot be adjusted and consequently they may be uncomfortable if exactly the right size is not chosen. Even then, adjustability is desirable to take account of variations in waist size occurring during the day, e.g. after eating. Additionally, a large selection of sizes is required if all body shapes are to be catered for.

Whilst the provision of reclosable fastening arrangements is used to provide adjustability and easy removal in nappies, no solution has yet been found for applying such a feature to absorbent pants whilst still allowing them to be produced in-line, which is a requirement for economically viable production.

Thus, the object of the invention is to provide a solution to the aforesaid problems by a particular method of producing a reclosable absorbent garment which can be manufactured by an in-line continuous process. The invention also seeks to provide a garment having a reclosable fastening arrangement which can be manufactured in an in-line continuous process.

Summary of the invention

The aforementioned object is solved by the method having the features defined in claim 1. Similarly, the garment of the invention is characterized by the features defined in claim 7.

Preferred embodiments of the invention are defined in the dependent claims.

In the claims, the term "releasably attachable" has been used to describe a material which is comprised in the first strip. It is to be understood that this term refers to a material which can be attached and re-attached to another part. For example such a material may be constituted by one part of a hook and loop material (such as the material sold under the trade name "Velcro" for example). Other materials which allow attachment, removal and reattachment are also included within said term.

Similarly, the term "reclosable fastening" also refers to a fastening comprising a releasably attachable material.

By means of the method and product of the invention, a single garment or a series of joined single garments is made available, which garment(s) are produced in the closed state (i.e. ready for being pulled on to the wearer as a normal pair of absorbent pants) in contrast to the open state in which normal nappies of the reclosable type are produced.

In a preferred embodiment of the invention, said garments are attached to one another after having been produced in an in-line process. By providing a line of weakening, such as a perforation or the like, between each of said garments, separation of individual garments or separation of a number of garments from the remainder is also possible. Such an embodiment allows the products to be supplied as a rolled up series of articles. Alternatively, with such an embodiment, said articles might be placed back-to-back in a joined stacked fashion. Such rolled-up or stacked joined articles have the additional advantage that said articles remain together, even when the outer packaging is removed. This joined relationship helps to prevent single absorbent articles becoming separated from a group of articles which can lead to the article becoming untidy or badly deformed (e.g. in a carrying bag or the like) as otherwise often occurs.

Brief description of the drawings:

The invention will now be described in more detail with reference to the accompanying drawings, in which:

Fig. 1 shows the first stage of the method according to a preferred embodiment of the invention, wherein a web of attached absorbent garments is moved in the direction of arrow A through two first zones "(a)" and "(b)",

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- Fig. 2 shows a further stage of the production method, in which the web shown in Fig. 1 has been folded about a central longitudinal axis so that the front and rear parts of said article are moved into contact,
- 5 Fig. 3 shows a still further stage of said method of production, in which the series of interconnected absorbent articles are separated, welded and severed into a plurality of separate absorbent garments in the further zones "(c)", "(d)" and "(e)" respectively,
- 10 Fig. 4 shows a cross-sectional view through Fig. 3, on to line IV-IV in zone "(c)", however with the first strip raised away from the third strip attachment elements merely for reasons of clarity.
- Fig. 5 shows a cross-sectional view through Fig. 3, on to line V-V in zone "(d)".
- 15 Fig. 6 shows a cross-sectional view, through one portion of the closed separate garment shown in Fig. 3 after zone "(e)", on to line VI-VI, and
- Fig. 7 shows a cross-sectional view similar to Fig. 6, wherein the reclosable fastening means has been opened.

Detailed description of a preferred embodiment

20 Fig. 1 shows a portion of a web 1 comprising a plurality of open absorbent articles laid side-by-side in connected fashion on a substantially flat conveying surface (not shown). The absorbent articles are delimited from one another in the shown embodiment by lines of weakening such as perforation lines 6. The web 1 thus-

25 formed is therefore substantially continuous, apart from said lines of weakening which run substantially perpendicular to the two longitudinal edges 25, 26 of said web. In the present case, two lines of weakening 6 are provided between adjacent

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articles, one on either side of a cut-away portion 7 which is used to form the leg openings of the garments to be formed.

The denotations "F" and "R" in the figure are used to indicate the front and rear surfaces respectively of the final garment to be obtained.

5 The lines of weakening 6 thus form lines of intended separation (i.e. for later separation) between the articles. The separation process will be explained below.

Each absorbent article comprises an elasticated, or non-elasticated, waistband portion 2 at either longitudinal edge of the web 1, said waistband portions being spanned by one or more sheets 28, such as for instance an impervious back sheet and a pervious top sheet or liner. An absorbent core 4, or an absorbent layer, is maintained in some manner between the two waistband portions, substantially symmetrically with respect to the centreline 3 of each article. Such an arrangement and the type of materials used will not be described in further detail since many types of such arrangement and materials are known to the skilled man.

15 Where an elasticated waistband is used, the line 6 (e.g. a perforation line) can be arranged so as not to sever the elastic threads of the waistband, which helps to give more structural integrity to the web during transport thereof in said production machine.

20 The web 1 is fed, preferably continuously in an in-line process, in the direction of arrow A, towards a zone "(a)". In zone "(a)", where in this embodiment a first preferred process step is carried out, a strip 5 of flexible material is attached to the web 1, for example by adhesive or ultrasound welding at the front F or rear R side, depending on which side (F or R) the stationary part of the releasable attachment closure is to be positioned. The strip 5, in the embodiment depicted, is thus applied over the line of intended separation 6 at the longitudinal edge 25, preferably with half the strip on one side and half on the other side of said line 6. The strip 5

comprises one of the elements of a releasable attachment means, such as for example the loop elements of a hook and loop attachment means. The loop elements may of course be formed integrally with said strip 5 or may be attached thereto.

5 The strip 5 will be applied to the outer surface of the sheet 28/waistband 2 with the loop elements facing away from the sheet 28 (i.e. out of the page in Fig. 1).

The application of strip 5 is however only required when the reclosable element of strip 8 (to be described) cannot releasably adhere by itself to the surface to which strip 5 has been applied. Thus, if the waistband surface under strip 5 comprised e.g. nonwoven material, a suitable hook attachment means could be used (on strip 8) to
10 releasably attach to this, such that strip 5 would not be required.

In order that the strip 8 can be releasably attached to strip 5 or the underlying surface in a reliable manner, said strip or surface should be relatively flat. Thus, in the depicted example using an elasticated waistband which comprises elastic elements adhered to said waistband region, it may be appropriate not to adhere the elastic
15 elements to the waistband in the region where strip 8 would be attached. In this way elastic contraction forces are not applied in that region which will help to prevent the region from crinkling. Crinkling should of course be avoided since this would reduce the effective surface area of releasable connection.

The strip 5 is preferably provided itself with a line of weakening positioned directly
20 above the line of intended separation 6. The line of weakening (e.g. perforation) can be made, or formed, on the strip 5 either before its placement over line 6 or can be produced together with line 6 (e.g. by perforating the web through strip 5). As a still further alternative, the line of weakening may be arranged in strip 5 after its application over a web 1 already provided with a line of weakening 6 in the
25 waistband portion 2.

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In zone "(b)", a flexible first strip 8 comprising the other element of the releasable attachment means is applied onto the strip 5, substantially symmetrically thereto. For example, if strip 5 comprises loop elements then strip 8 would comprise hook elements. Strip 8 is applied with the hook elements facing the loop elements of strip 5 such that the strip 8 is held releasably in position.

Strip 8 should preferably be of a soft, yet strong material, such as nonwoven material, on which the releasably attachable element has been fixedly attached.

Since the material of strip 8 will generally not be elasticated, the method of the invention (as will be described later) will in such a case require that a surplus 9 of material be available, said surplus being positioned directly above the line 6. As is shown in Fig. 1, this results in a gap being present beneath the surplus 9 of material of the strip 8 between the innermost attachment locations of the strip 8 to the strip 5. Said gap is shorter in length than the length of surplus material 9 (as seen in the longitudinal direction of said web 1). In the present case, the strip 8 has been chosen to be approximately equal to the length of strip 5. The surplus of material above line 6 is thus achieved by leaving a margin 10 at the outer edges of strip 8 with respect to strip 5.

A second strip 13 of flexible material, such as a soft and strong nonwoven material, is fixedly attached by means of an ultrasound weld 20 (see Fig. 4), or the like, at the opposite longitudinal edge 26 of the web 1 and on the same face of the web as strips 5 and 8. The strip 13 is applied in a similar manner to strip 8, such that a surplus of material 14 is left above line 6. As with strip 8, the gap between the attachment locations of strip 13 is shorter than the length of the surplus material 14 (as seen in the longitudinal direction of said web).

In a next step after zone "(b)" as shown in Fig. 2, the web 1 is folded longitudinally approximately midway between the longitudinal edges 25 and 26. The front and rear waistband portions are thereby placed together such that a row of connected articles

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is formed. At this stage, there is however no attachment between the front and rear surfaces F, R along the waistband.

Moving from left to right, as seen with regard to Fig. 3, the folded web moves through zones "(c)", "(d)" and "(e)".

5 In zone "(c)", adjacent articles are longitudinally separated with respect to one another. The magnitude of said longitudinal separation is such that the line of intended separation 6 is severed on both front and rear surfaces, yet the first and second strips 8 and 13 remain intact, since they are not subject to any excessive tension due to the surplus of material which was provided. The material strip 5
10 (where this is provided) however, is severed across its line of separation.

When viewing the cross-section of zone "(c)" along line IV-IV it will be clear that between the strips 8 and 13, and between the inner edges of web 1 where the line 6 was placed, a free zone 15 of non-attachment is provided. It should also be noted that although Fig. 4 depicts the strip 8 as separated from the optional third strip 5,
15 this is merely for clarity and the strip 8 would normally be attached to strip 5.

Having longitudinally separated the articles in zone "(c)", the folded web moves to zone "(d)" in which two welds 17, or other means for providing a secure attachment, are made across the free zone 15 so that the strips 8 and 13 are securely joined together. In a further embodiment (not shown) the two welds can be combined as a
20 single weld.

Fig. 5 shows a cross-sectional view through zone "(d)", whereby the position and extent of the two welds is shown. Although the releasable attachment portion 18 of strip 8 is not shown in contact with the underlying web 1 or the other part of the releasable attachment means, this will of course be the case. The strips have been
25 shown as separate, merely for reasons of clarity. At this stage, the web will comprise a series of adjacent absorbent garments, separated by the welds 17.

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It should be noted that the relative dimensions of the parts shown in Figs. 4 and 5 depict approximate relative size relationships, suitable for carrying out the invention.

5 In zone "(d)", a line 16 is also depicted. The line 16 depicts a line of severing or, in another embodiment, a line of intended severing. Taking the embodiment depicted in Fig. 3, the line 16 is a cut which passes through the strips 8 and 13 between, or through, the welds 17. Any elastic cords from the elasticated waistband present at this location will also be severed by said cut.

10 The web is then moved further to station "(e)", in which the articles are separated from one another by longitudinal displacement, such that the cut line 16 leaves opposing free edges 29 on adjacent articles 27. Each opposing free edge 29 will comprise the free ends of each of the strips 8 and 13 which will be flush with each other where the line 16 was made.

15 The produced separate article(s) 27 will thus have two reclosable fastening arrangements 21, 22 thereon, one on either side. Thus, it will be seen that by providing a reclosable fastening arrangement in the way described, separate articles or a series of closed separate articles can be simply packed into an outer packaging wrapper. On reaching the end user, the article(s) merely needs to be withdrawn from the packaging and put on like a pair of ordinary underpants, without any need to try and assemble the garment first. Once the garment is on the user, either side can be
20 adjusted separately if desired by using the reclosing arrangement now provided.

25 In a further embodiment, the line of severance 16 can be replaced by a line of weakening, such that the products are held together as a strip, but with the possibility of the end user detaching one or more of said garments by an easy tearing action. With such an embodiment, the web of articles can be packed as a roll or as a zig-zag stack.

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Fig. 6 shows a view through one side of the absorbent garment of Fig. 3, after separation at zone "(e)" and in the closed state, however expanded out as if a user was wearing the garment, so that the cut-out portion 7 represents a leg opening. Fig. 7 shows the same view as Fig. 6 but in the opened state, ready for removal or adjustment.

As will be seen, the front F and rear R sections meet a short distance away from each other although adjustment by opening and reclosing will allow them to overlap. A first part of the reclosable fastening arrangement 22 is attached to the rear section R and comprises said second strip 13 securely attached to the outer surface thereof by means of connection 20 (see Fig. 4). Attached to said second strip 13 by means of weld 17 is said first strip 8. Said first strip 8 comprises one half of the releasable attachment means 18. Numeral 19 denotes a free forward edge portion which is left so that the strip end can be gripped. Said first part is thus a combined strip having first and second ends 23 and 24 respectively, one of said ends being permanently attached and the other being releasably attachable to the front section at 5.

As will be seen however, at the middle of the combined strip, the two strips 8 and 13 are securely attached together so that their ends lie flush with one another at free edge 29, due to the cutting procedure adopted. By this unique arrangement of the strips so as to be flush with one another (and thus providing a free outer edge) at the joining portion, as opposed to the traditional overlapping connection which is used for reclosable strips, a novel garment is arrived at which allows in-line production of the same so as to produce a closed garment directly from the production line, without further intervention by machine or personnel.

The further particular features of the garments having fastening arrangements in accordance with the present invention will be apparent to the skilled man in particular from viewing Figs. 6 and 7.

It should be understood that the references to "front" and "rear" sections (F and R) of the article are not limiting for the position of the reclosable means. Thus, the references "F" and "R" respectively in Fig. 6 could alternatively have been "R" and "F" respectively, such that the strip 13 would instead be attached to the front section F and not the rear section R as shown.

The function of releasing, re-attaching and adjusting of the fastening arrangements 21 and 22 will be clear to the skilled man and thus need not be described in further detail here.

The foregoing description merely contains illustrative examples of how the invention may be carried out. The invention may however be varied in many ways without departing from the scope thereof as defined by the appended claims. For example, although it has been described that surplus material 9 is left over line 6 for strips 8 and 13, in order that said strips will not break when the separation of zone "(c)" is carried out, the strips could be arranged to be elastic in said region instead and be laid relatively flat over said line 6. However, such an embodiment is not preferred.

A further variant of the invention may also be that strips 5 and 8, or the waistband 2 and the strip 8 (if no strip 5 is present), are each provided with one half of a male/female coupling. One half (e.g. the male part) of the coupling would be fixed in position on the strip 8 and one half (e.g. the female part) would be fixed in position on strip 5 (or waistband 2, if no strip 5 is present). Such male and female connections could be moulded or otherwise attached or even formed together with the strip. This arrangement would allow the reclosure of the article to a fixed position each time that the article is opened and reclosed. As an example of how this would appear, in Fig. 7, the parts 18 and 5 could be a male part and a female part respectively.

Further embodiments and modifications of the invention within the scope of the appended claims will be apparent to the skilled man.

CLAIMS

- 5 1. Method of producing reclosable absorbent garments (17) for the absorption of human exudate, from a web (1) comprising a plurality of open absorbent articles attached side-by-side so as to form a substantially continuous web of attached articles having opposed longitudinal edges (25, 26), and wherein a line of intended separation (6) is arranged between adjacent articles, said method comprising the steps of:
- 10 a) applying a first strip (8) of flexible material across the line of intended separation (6) at one longitudinal edge (25) of the web, said first strip (8) comprising a zone of releasably attachable material (18) facing said web and positioned on either side of said line (6),
- 15 b) applying a second strip (13) of flexible material across the line of intended separation (6) at the other longitudinal edge (26) of the web,
- 20 c) folding the web between the longitudinal edges (25, 26) so as to obtain a web of articles folded front side (F) to rear side (R),
- d) longitudinally separating said adjacent articles at said line of intended separation (6) but without rupturing said strips (8, 13), so as to provide a free zone (15) between said strips (8, 13) and the adjacent separated edges of each article,
- e) securely joining said first and second strips (8, 13) together across said free zone (15) so as to form closed garments.
2. Method according to claim 1 wherein, prior to step (a), a third strip (5) of flexible material is applied to said web (1) across the line of intended separation (6)

at the same longitudinal edge (25) to which said first strip (8) is to be attached, and wherein said third strip (5) comprises material to which the releasably attachable material (18) of said first strip (8) will attach.

3. Method according to claim 1 or claim 2, wherein said first (8) and second (13) strips are attached to said web (1) at attachment locations on either side of the line of intended separation (6) so as to leave a gap extending on either side of said line of intended separation (6), and wherein the length of material of said strips between said attachment locations is greater than the length of the gap.

4. Method according to any one of the preceding claims, wherein said absorbent garments are separated completely from one another by severing the joined strips (8, 13) at a location (16) intermediate of where said strips have been joined together, thus producing a series of separated, closed absorbent garments.

5. Method according to any one of claims 2 to 4, wherein said third strip (5) is provided with a perforation line which is positioned in line with said line of intended separation.

6. Method according to any one of the preceding claims, wherein each of said garments has an elasticated waistband (2), the elastication means for said waistband being applied by adhesion prior to the application of any of said strips (5, 8, 13), and wherein, in the region where said strips (8, 13) are to be attached, said waistband (2) is not adhered to said web, to thus provide a relatively flat outer surface at said region.

7. Absorbent garment (27) for the absorption of human exudate, said absorbent garment comprising a waistband portion divided into front (F) and rear (R) sections by means of two reclosable fastening arrangements (21, 22), each of which fastening arrangements is positioned at a respective end of said front and rear sections, wherein each of said fastening arrangements (21, 22) comprises a first part (8, 13,

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17, 18, 19) which has first and second ends (23, 24), the first end (23) being fixedly secured to said front or rear section and the second end (24) comprising a reclosable fastening portion (18), the first end (23) of said first part and the second end (24) of said first part each being provided on respective first and second separate strips (13, 8), characterized in that an outer free end of one strip (8) of said strips (8, 13) is fixedly secured so as to be flush with an outer free end of the other strip (13) of said strips (8, 13) so as to provide a combined strip (8, 13, 17) having a free outer edge (29) containing the two flush ends.

8. Reclosable absorbent garment according to claim 7, characterized in that said waistband portion comprises one or more elastic elements (2) adhered thereto, and in that a zone of non-adhesion of said elastic elements is provided on said waistband beneath said reclosable fastening arrangements (21, 22), such that said waistband is substantially flat in said zone compared to the rest of said elasticated waistband.

9. Reclosable garment according to claim 7 or 8, characterized in that said absorbent garment is a closed pair of absorbent reclosable pants comprising an absorbent core.

10. Reclosable absorbent garment according to any one of claims 7 to 9, characterized in that said reclosable portion (18) on said first strip (8) is one part of a male/female coupling, and in that said waistband (2), or optional third strip (5) thereon, is provided with the other part of said male/female coupling.

11. Series of closed absorbent garments in accordance with the method of any one of claims 1 to 3, 5 or 6, each of said garments being in accordance with any one of claims 7 to 10, characterized in that said absorbent garments (27) are attached to one another by means of the joined first and second strips (8, 13), said strips (8, 13) being attached between adjacent garments (27), and in that a line of weakening is provided at a location (16) intermediate of where said strips (8, 13) have been joined

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together, so as to allow separation of one or more of said garments from the remainder.

5 12. Method as claimed in claim 1 substantially as
hereinbefore described with reference to and as
illustrated in Figures 1 to 5 of the accompanying
drawings.

10 13. Series of reclosable garments as claimed in claim
11 substantially as hereinbefore described with
reference to and as illustrated in Figures 2 or 3 of
the accompanying drawings.

15 14. Reclosable garment as claimed in claim 7
substantially as hereinbefore described with reference
to and as illustrated in Figures 3, 6 or 7 of the
accompanying drawings.

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United States Patent [19]

Endres et al.

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[45] Date of Patent: Jun. 18, 1996

[54] CONFORMABLE ABSORBENT ARTICLE

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[21] Appl. No.: 14,045

[22] Filed: Feb. 5, 1993

Related U.S. Application Data

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[51] Int. Cl.⁶ A61F 13/15

[52] U.S. Cl. 604/385.1; 604/385.2; 604/391; 604/382

[58] Field of Search 604/358, 385.1, 604/385.2, 378-384, 386, 391

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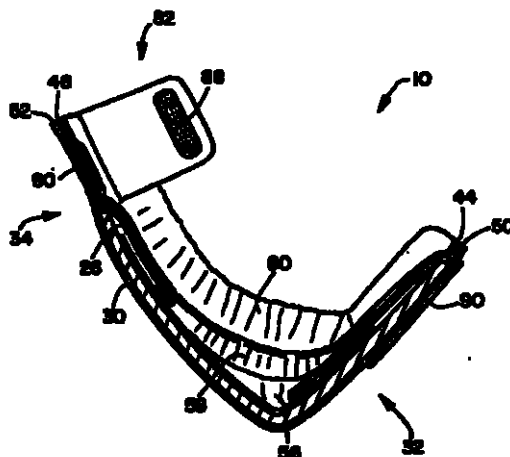
Attorney, Agent, or Firm—Jeffrey B. Curtin

[57]

ABSTRACT

A conformable absorbent article has a topsheet that is designed to substantially fully contact the body of the wearer to provide improved performance in managing and containing body wastes. Management and containment of body wastes are improved by several structural elements that can be utilized individually or collectively. Some of these elements are a waste-containment pocket formed between the topsheet and backsheet, an opening in the topsheet for receiving body wastes therethrough, a pair of containment flaps and a pair of side flaps, and an expandable backsheet to retain body wastes therein.

16 Claims, 7 Drawing Sheets



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4,681,581	7/1987	Comes	604/391	4,950,262	8/1990	Takagi	604/385.1
4,685,916	8/1987	Enloe	604/385 A	4,968,312	11/1990	Khan	604/388.1
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190
178

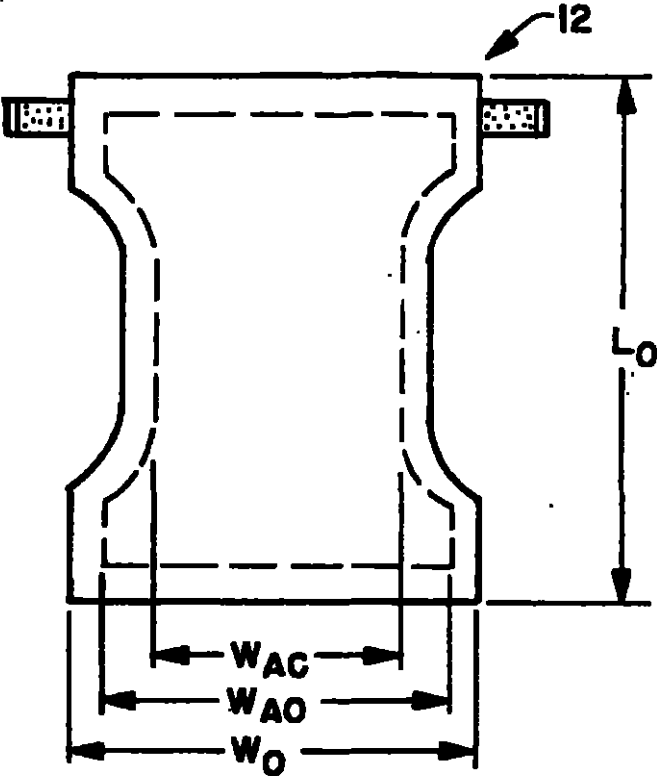


FIG. 1 (PRIOR ART)

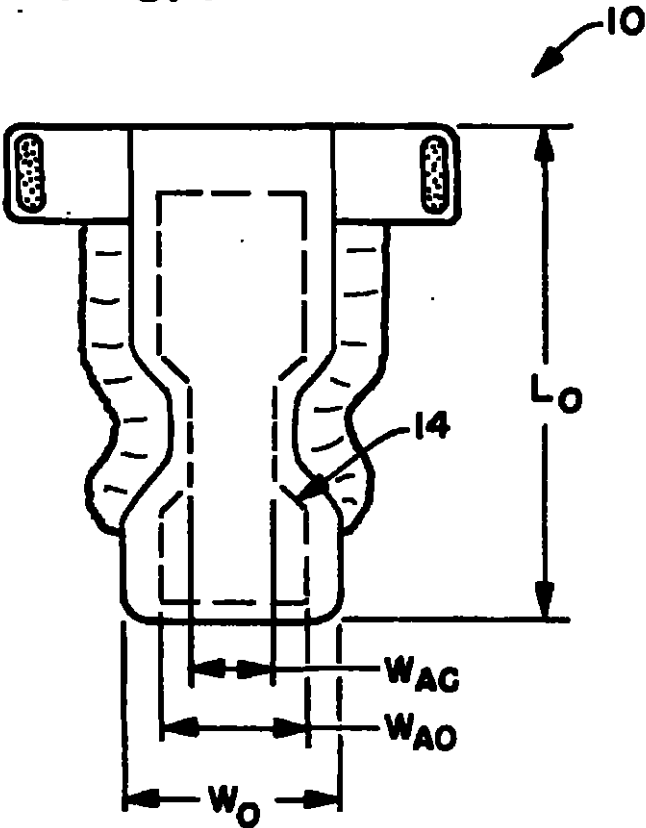


FIG. 2

191
179

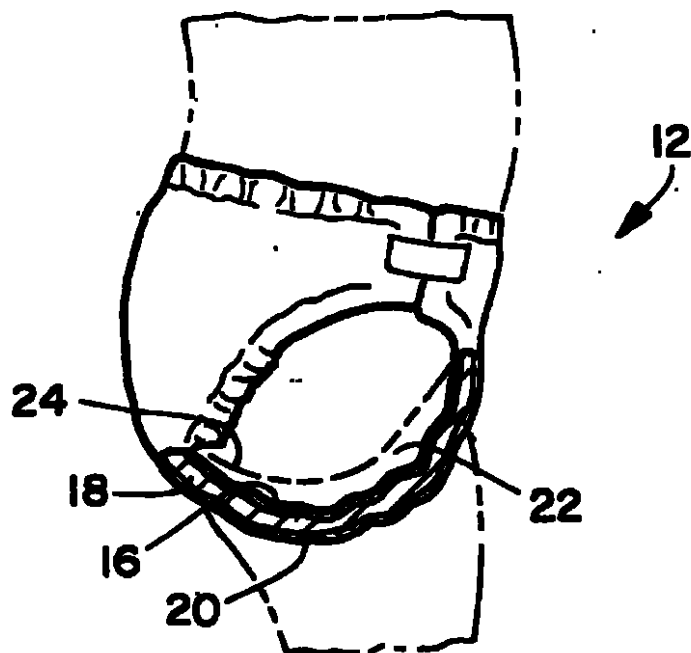


FIG. 3A (PRIOR ART)

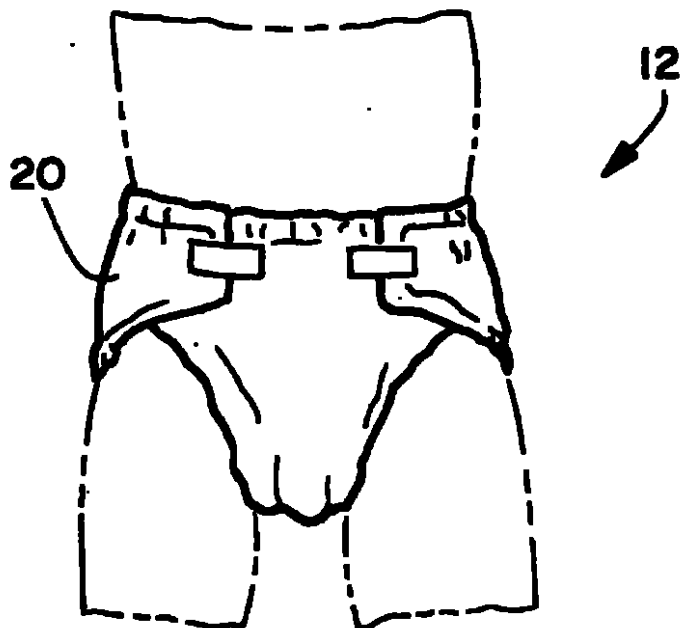


FIG. 3B (PRIOR ART)

192
180

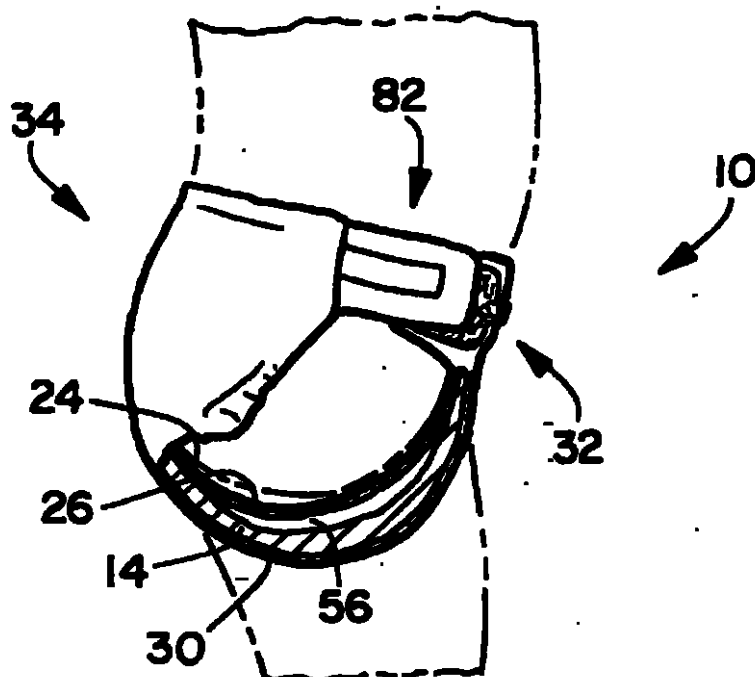


FIG. 4A

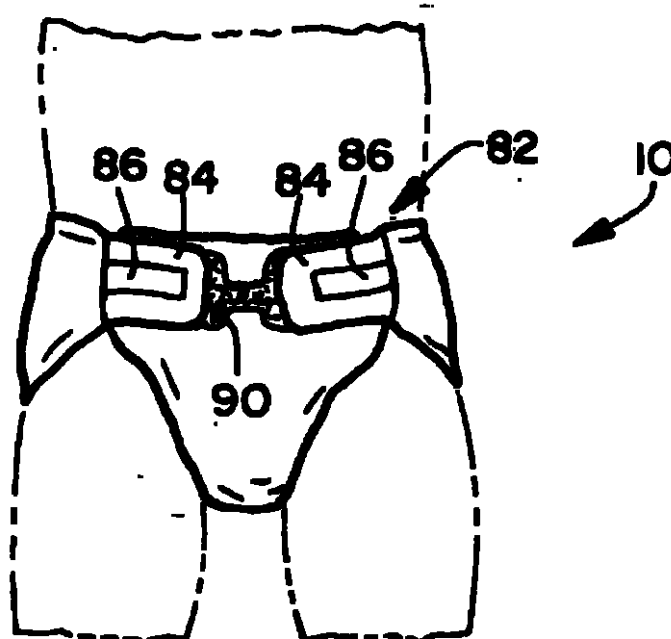


FIG. 4B

194
182

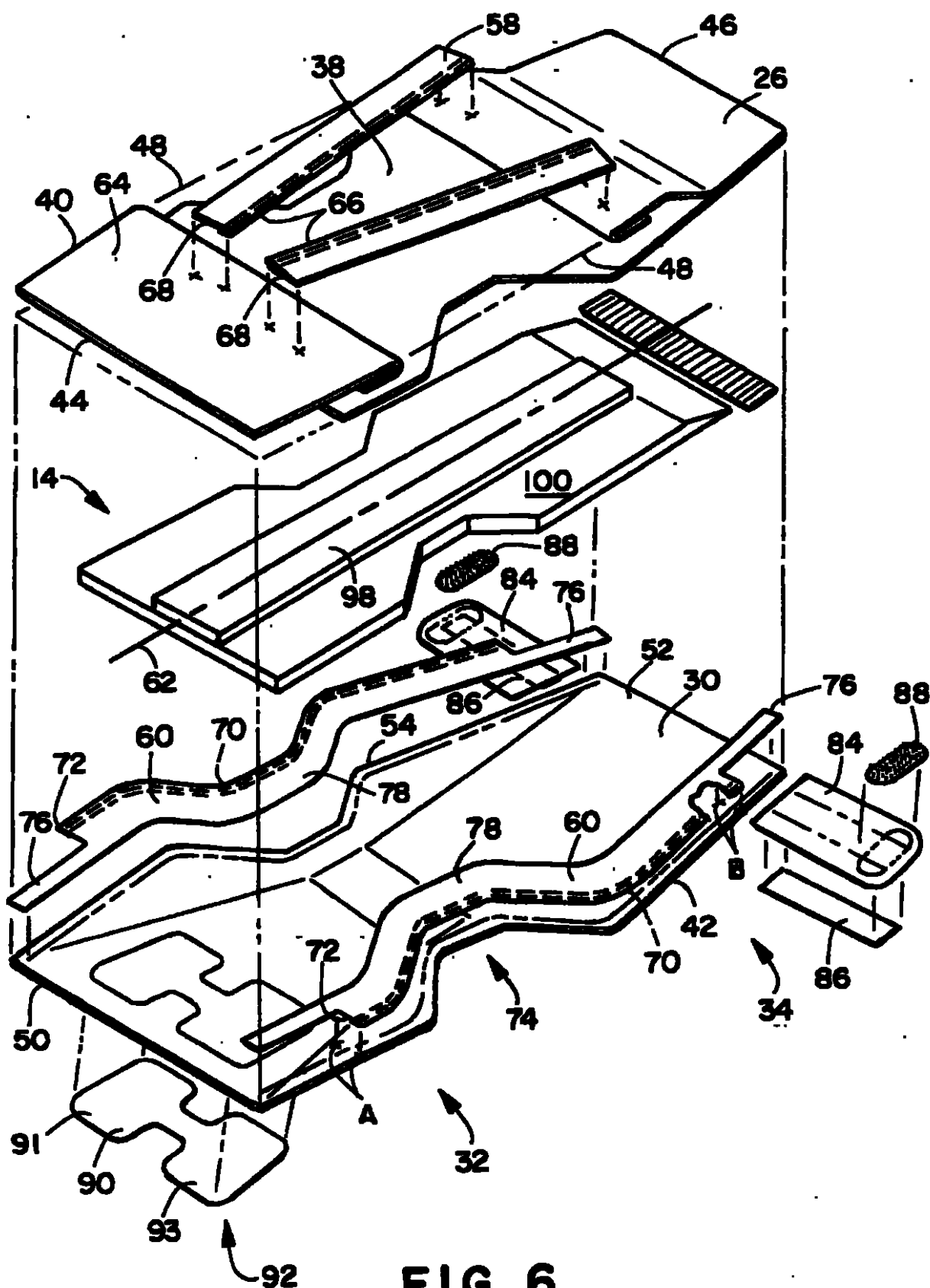


FIG. 6

195
183

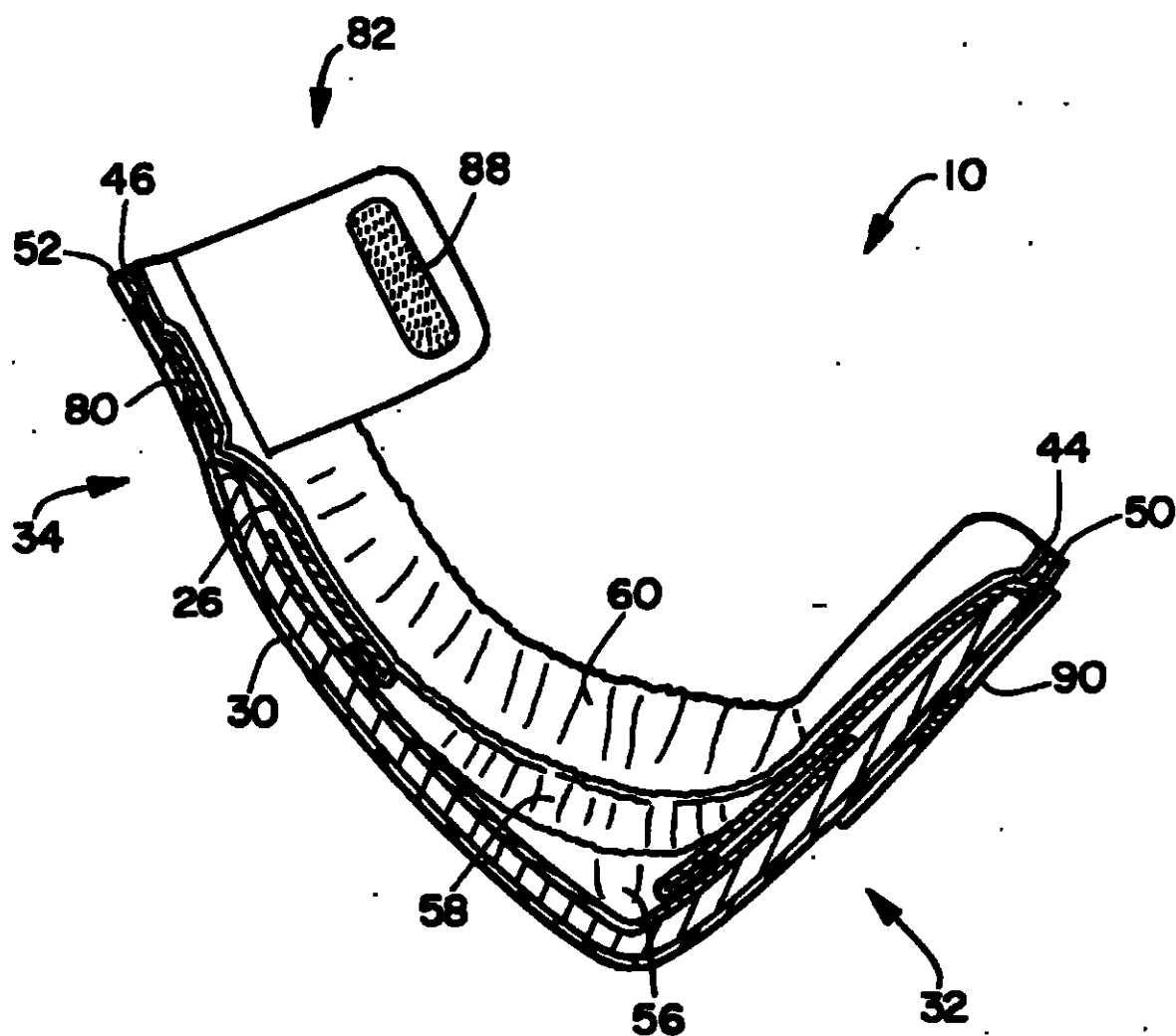


FIG. 7

CONFORMABLE ABSORBENT ARTICLE

BACKGROUND OF THE INVENTION

This is a continuation of application Ser. No. 07/826,309 filed on Jan. 24, 1992 which is a continuation of Ser. No. 07/452,867 filed on Dec. 19, 1989, both now abandoned.

This invention pertains to absorbent articles, and more particularly to an improved disposable absorbent article that easily and closely conforms to the body, specifically in the perineum area, of the wearer to provide improved performance in managing and containing body wastes.

Currently, disposable absorbent articles find wide spread use in infant, child, and adult incontinence care, and have generally replaced reusable cloth absorbent articles. A typical disposable absorbent article is a three-layered composite structure comprising a topsheet material, a backsheet material, and an absorbent material disposed therebetween.

One problem with current absorbent articles is the amount of skin area within the article that is exposed to body waste material. For example, current baby diapers are generously cut wider in the crotch area to assist in urine and BM management. This results in excess material bunching together between the legs, which can be extremely uncomfortable to the wearer. This bunching of material is further exacerbated by the elastication of the diaper edges. Consequently, the topsheet is prevented from being in close contact with the perineum area, thereby resulting in loss of management and containment of the flow of waste material between the body orifices and topsheet surface which in turn results in the spreading of waste material along the topsheet surface and against the wearer's skin.

Another problem with current absorbent articles is that leg movements over a period of time against the excess material between the legs can cause the absorbent to break apart, thereby decreasing its absorbent effectiveness.

Yet another problem with excess material between the legs is that the churning movement of the legs on the bunched-up material in the crotch causes the article to be pulled down from the crotch area, thereby further increasing the bunching problem and exposing additional skin area to fecal matter.

Still another problem is that excess material between the legs allows shifting or moving of the article in the crotch area, thereby further increasing problems with skin exposure to waste.

These problems generally result in skin dermatitis, skin hydration, and/or messy clean-ups.

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is provided a disposable absorbent article comprising a liquid permeable topsheet having a topsheet peripheral measurement, and a liquid impermeable backsheet having a backsheet peripheral measurement that is greater than the topsheet peripheral measurement. The topsheet periphery and the backsheet periphery are joined together to form a waste containment pocket therebetween. The liquid permeable topsheet has an opening therein and is adapted to substantially fully contact the body of the wearer.

In another embodiment of the invention, there is provided a disposable absorbent article comprising a liquid permeable topsheet, a liquid impermeable backsheet, and an absorbent structure between the topsheet and backsheet, a pair of containment flaps positioned near the lateral sides of the topsheet, and a

pair of side flaps positioned near the lateral sides of the topsheet.

In yet another embodiment of the present invention, there is provided a disposable absorbent article comprising a topsheet having a topsheet peripheral measurement, a backsheet having a backsheet peripheral measurement, and an absorbent structure between the topsheet and the backsheet. The backsheet is expandable so that upon receiving body wastes, the backsheet expands for the containment thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features and objects of this invention, and the manner of attaining them, will become more apparent and the invention itself will be better understood by reference to the following description of the embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a top plan view of a prior art diaper;

FIG. 2 is a top plan view of a diaper of the present invention;

FIG. 3A is a side view of the prior art diaper in FIG. 1 as it would appear being worn;

FIG. 3B is a front view of the prior art diaper in FIG. 1 as it would appear being worn;

FIG. 4A is a side view of a diaper of the present invention in FIG. 8 as it would appear being worn;

FIG. 4B is a front view of the embodiment of the present invention in FIG. 8 as it would appear being worn;

FIG. 5 is a perspective view of the embodiment of the present invention in FIG. 8 in its relaxed state;

FIG. 6 is an exploded and partially broken-away view of the embodiment of the present invention in FIG. 8;

FIG. 7 is a cross-sectional view of FIG. 5 taken along line 7-7 and viewed in the direction of the arrows; and

FIG. 8 is a top plan view of a diaper of the present invention.

DETAILED DESCRIPTION

The absorbent article of the present invention can be utilized as a baby diaper, adult incontinence garment, feminine care product, and the like. For purposes of the present discussion, the absorbent article will be described in terms of a baby diaper designed to fit a baby weighing between about 12 to about 24 pounds, but it is understood that the features and principles of the present invention apply to other baby sizes. As illustrated in FIGS. 1 and 2, disposable diaper 10 of the present invention is much smaller in size than a conventional diaper 12 of the prior art. Specifically, the overall length, L_o , of diaper 10 of the present invention is about 14 inches to about 15 inches; while the overall length, L_o , of conventional diaper 12 is about 17 inches to about 18 inches. The overall width, W_o , of diaper 10 is about 5 inches to about 8 inches; while the overall width, W_o , of conventional diaper 12 is about 12 inches to about 13 inches. The overall width, W_{AO} , of absorbent structure 14 of diaper 10 is about 4 inches to about 7 inches; compared to the overall width, W_{AO} , of about 10 inches to about 11 inches of conventional diaper 12. The width of the absorbent at the crotch, W_{AC} , of diaper 10 is from about 2 inches to about 3 inches; while the absorbent width at the crotch, W_{AC} , of conventional diaper 12 is about 5 inches to about 6 inches.

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Having compared the two diapers in size, a comparison of how they generally fit a baby is illustrated in FIGS 3A-4B. In FIGS 3A and 3B, conventional diaper 12 is being worn by a baby having a weight between about 12 to about 24 pounds. As illustrated, topsheet 16, absorbent 18, and backsheet 20 of conventional diaper 12 are bunched up and spaced away from crotch 24 forming a space 22 between crotch 24 and diaper 12. It is this forming of space 22 that causes loss of management and containment of waste material. The waste material spreads along topsheet 16 and contacts a large area of the baby's skin during movement of the baby. The bunching of topsheet 16, absorbent 18, and backsheet 20 at crotch 24 can cause breaking up of the absorbent material from leg movements, drooping of the diaper in the crotch, and shifting of the diaper on the baby.

Referring to FIGS. 4A-B, topsheet 26, absorbent structure 14, and backsheet 30 of diaper 10 of the present invention are positioned in crotch 24 such that topsheet 26 substantially fully contacts the baby, particularly at crotch 24, thereby virtually eliminating or minimizing space 22. Topsheet contact with the body along a line centered or measured through crotch 24 from below the navel to the small of the back is important to positioning an opening or BM containment device in or associated with topsheet 26 relative to the anus to allow containment of feces under topsheet 26 or in the device. It is also important in urine control or management for immediate penetration through topsheet 26, thereby preventing urine from flowing over the topsheet surface. Two methods to obtain the preferred body contact with topsheet 26 are, first, cut and/or elastically narrow topsheet 26 to fit the crotch dimensions, and second, form the absorbent crotch width to have a width from about 2 inches to about 3 inches to allow the diaper to fit up between the baby's legs.

Referring to FIGS 5 and 6, diaper 10 generally comprises liquid-permeable topsheet 26 having an opening 38 therein, liquid-impermeable backsheet 30, and absorbent structure 14 positioned therebetween.

Topsheet 26 has periphery 40 defined by front longitudinal end 44, back longitudinal end 46, and lateral sides 48. Similarly, backsheet 30 has periphery 42 defined by front longitudinal end 50, back longitudinal end 52, and lateral sides 54. Periphery 42 has a peripheral length or measurement greater than that of periphery 40. Periphery 42 can be made to have a peripheral measurement greater than periphery 40 by making topsheet 26 more narrow than backsheet 30, or more shorter than backsheet 30, or both. When topsheet 26 is joined to backsheet 30 along their respective peripheries 40, 42, waste containment pocket 56 is formed therebetween (FIG 7). Topsheet 26 and backsheet 30 can be joined or attached in any suitable manner, such as by a line or lines of adhesive bonding, thermal bonding, or ultrasonic bonding, and can be joined at their peripheral edges or slightly inboard thereof, for example, at a distance from about one-eighth inch to about three-eighths inch or more from the peripheral edges.

Absorbent structure 14 is positioned between topsheet 26 and backsheet 30, and is joined or attached to backsheet 30 by any suitable means, such as by lines or a surface spray of adhesive. Waste containment pocket 56 is then defined between absorbent structure 14 and topsheet 26. Waste containment pocket 56 is designed to receive and contain a volume of fecal matter of at least about 150 cubic centimeters.

A dual pair of flaps are also disposed on diaper 10, and are identified as containment flaps 58 and side flaps 60. Within

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the context of the present disclosure, the terms "disposed", "disposed on", "disposed with", and any variations thereof, are intended to mean as a minimum that one element can be formed integrally from another element, or one element can be separate structure joined to or placed with or near another element. Side flaps 60 can be formed from extensions of lateral sides 54 of backsheet 30 and/or lateral sides 48 of topsheet 26, or can be separate structural elements attached to backsheet 30 and/or topsheet 26. Preferably, side flaps 60 are made of liquid-impermeable material that is vapor permeable for increased air circulation in the crotch region, but may be made, if desired, from a liquid and vapor impermeable material or a liquid and vapor permeable material. Side flaps 60 can also have selected portions that are liquid permeable with the remaining portions being liquid impermeable.

Containment flaps 58 are located inboard of side flaps 60, i.e., closer to longitudinal centerline 62 (FIG 6) than flaps 60. Centerline 62 is illustrated through absorbent structure 14, but is also intended to be the centerline for topsheet 26, backsheet 30, and diaper 10. Containment flaps 58 can be integral extensions of liquid-permeable topsheet 26, or can be separate liquid-permeable elements attached or joined to topsheet 26 inboard of side flaps 60. Flaps 58, 60 border the lateral sides of opening 38, with containment flaps 58 being closer to opening 38 than side flaps 60. Containment flaps 58 can also have selected portions that are liquid permeable with the remaining portions being liquid impermeable. Flaps 58 can also be liquid impermeable.

In one embodiment, containment flaps 58 are separate elements attached or adhered to upper surface 64 of topsheet 26, and side flaps 60 are separate elements attached or adhered between topsheet 26 and backsheet 30. Containment flaps 58 include at least one elastic member 66 in each distal edge portion 68, and preferably at least two or more elastic members 66 in each distal edge portion 68. Elastic members 66 are positioned and secured within respective distal edge portions 68 in a stretched or elastically contractible manner, such that upon relaxing elastic member 66, containment flaps 58 gather or shift as illustrated in FIGS 5, 7.

In a similar manner, side flaps 60 have elastic members 70 attached in a stretched or elastically contractible condition within respective distal edge portions 72 of side flaps 60. As illustrated in FIG 6, and with reference to a single side flap 60 since both side flaps are identical, each side flap 60 comprises narrow end portions 76 with intermediate flap portion 78 extending therebetween in a preferably curvilinear fashion to accommodate and correspond to leg cut-outs 74.

One of the important aspects of the present invention is the various methods of disposing side flaps 60 with backsheet 30. In one method of positioning side flap 60 for attachment to backsheet 30, flap 60 is first pleated or elastically gathered, and thereafter attached or joined to backsheet 30 in the pleated or gathered state in a manner that does not pleat or gather backsheet 30. In this fashion, the overall, flattened-out length of intermediate flap portion 78 is longer than the flattened-out distance between points A and B on backsheet 30; points A and B being orthogonal projections of the remote ends of intermediate flap portion 78 on backsheet 30. Thus, upon pressing or flattening backsheet 30 against a flat surface, each intermediate flap portion 78 will have a shirred or ruffled appearance that is complemented by elastic members 70.

Another method of disposing flaps 60 with backsheet 30 is to maintain pleated or elasticized flaps 60 in a stretched-

out state and then attach or join them to backsheet 30 to pleat or gather backsheet 30 upon relaxation thereof.

If desired, side flaps 60 can be designed without narrow end portions 76, and elastic members 70 can be attached the full length of diaper 10. Thereafter, selected portions of elastic members 70 can be de-elasticized by application of heat or other treatment dependent upon the material of which elastic members 70 are made.

Referring to FIGS. 5-8, disposable diaper 10 can also include waist elastics in the longitudinal end portions of front panel 32 and back panel 34. In one embodiment illustrated in FIG. 8, only back waist elastic 80 is joined to back panel 34, and can either be joined between backsheet 30 and topsheet 26 or joined only to backsheet 30 to allow greater elastic retraction. Waist elastic 80 is adhered or joined to back panel 34 in a stretched or elastically contractible condition, so that upon relaxation that portion of back panel 34 is gathered.

A pair of stretchable ears 82 are attached to opposite longitudinal sides of back panel 34, and are preferably in-line with back waist elastic 80. Since both of the stretchable ears 82 are identical, the following description will be made in terms of a single stretchable ear. Stretchable ear 82 comprises stretchable member 84 and stretchable band 86. Stretchable band 86 is connected to member 84 to aid in preventing stress failure to ear 82 and to apply additional elastic reinforcement to the center of ear 82. Both stretchable member 84 and stretchable band 86 are joined between backsheet 30 and topsheet 26, with band 86 preferably disposed on backsheet 30. Stretchable members 84 and/or stretchable bands 86 can be a stretch-bonded laminate.

Preferably, ears 82 are designed and manufactured as a single strip of elastic or stretchable material having the same stretch characteristics as the combination of stretchable member 86 and stretchable band 84.

To fit and maintain disposable diaper 10 on the wearer, a hook-and-loop fastening system is provided with tabs 88 of hook material joined to the side of stretchable member 84 opposite band 86, and panel 90 of loop material joined to backsheet 30. Although hook-and-loop fasteners are preferred, other fastening arrangements can be used, such as tapes, snap fasteners, and the like.

In one embodiment, backsheet 30 is made of a liquid-impermeable material, and preferably a polyethylene film having a thickness of about 1.0 mil, although thicknesses above 0.50 are functional. Backsheet 30 is generally flat, i.e., not pleated or microcreped, and has a peripheral measurement greater than the peripheral measurement of topsheet 26. In joining backsheet 30 and topsheet 26 to form waste containment pocket 56, periphery 42 of backsheet 30 needs to be drawn inwardly to be joined to periphery 40 of topsheet 26. One method of forming backsheet 30 in this manner is by vacuum forming backsheet 30 into a mold of predetermined shape and dimensions that result in waste containment pocket 56 having a preferred shape.

In another embodiment, additional useable volume in waste containment pocket 56 is included by providing (1) a means for the feces to pass through or around the absorbent core, for example, a trapezoidal-shaped hole in the absorbent having a rear width of about 1.5 inches, a front width of about 1 inch, and sloping side lengths of about 4 inches; and (2) an outer barrier sheet, such as backsheet 30, having dimensions longer than the topsheet and absorbent core and having a space formed between backsheet 30 and the absorbent core so as to contain the fecal material between the absorbent and the backsheet.

Other means of providing additional useable volume in pocket 56 by using backsheet 30 include (a) using an embossed film which can expand easily, (b) making the backsheet from a low modulus, easily elongatable film, such as "KRATON" styrene-butadiene elastomer or ethyl vinyl acetate (EVA), (c) creping an ordinary film in the same method that tissue is creped to form creped wadding, (d) forming pleats in the machine direction or cross direction in the backsheet or only portions of the backsheet which can easily expand, and (e) thermal forming a bulge in the crotch area of the backsheet. Alternatively, topsheet 26 can be made of a stretchable material and cut shorter and/or narrower than backsheet 30, and then peripherally joined to backsheet 30 to provide additional useable volume.

The total volume to handle fecal matter should be at least about 150 cubic centimeters. The amount of expandability required in backsheet 30 depends on the desired degree of reduction in fecal smearing, the volume of fecal material the design is intended to handle, and the volume of the hole provided in absorbent 14 when the wearer is in the sitting position. For example, since normally 60 cubic centimeters or less of fecal material would be expelled in one defecation and if the volume of the hole in the absorbent would be about 20 cubic centimeters, then the expandability of the backsheets should handle about 40 cubic centimeters.

In order to provide this volume, experience has shown that a desirable range of expandability of backsheet 30 is from about 20% to about 100%. The exact amount is dependent on a wide range of variables including the baby's position during defecation, tightness of the baby's clothing, viscosity of the fecal material, pressure exerted by the topsheet against the body, resistance of the material to the expansion force of the bowel movement, rate of expulsion of the fecal material from the body and rigidity of the absorbent material. Materials that readily expand about 20% or more under a force of about 25 grams per inch of width or less function adequately and can expand sufficiently to accommodate normal volume bowel movements.

Another method for fecal management would be to have a normal, non-expandable backsheet in combination with an absorbent with a hole in the absorbent; the hole having about 20 cubic centimeters to about 60 cubic centimeters volume. Also required would be a topsheet with a hole or holes sufficient to allow fecal material to pass through, and which substantially fully contacts the body along a line through the crotch from the front end of the diaper to the back. The hole can be covered or masked with an opaque material disposed between the topsheet and absorbent. Within the context of the present disclosure, the term "substantially fully contacts," and any variations thereof, is intended to mean as a minimum that topsheet 26 is sufficiently close to the body to prevent misalignment between the hole in topsheet 26 and the anus. A major portion of the upper surface, i.e., body-facing, surface area of topsheet 26 will be in contact with the skin of the wearer, except those areas of topsheet 26 that overlie the natural crevices or folds of a baby's body, such as the crevice between the baby's buttocks and the folds of skin at the juncture between the inner thighs and crotch. Naturally, if topsheet 26 has a plurality of small holes or a single larger opening therein, topsheet 26 will not contact the skin at those holes or openings. "Substantially fully contacts" can also be defined as that percent of topsheet 26 in contact with skin, for example, about 70% to about slightly less than 100% of topsheet 26 being in contact with the baby's skin.

Backsheet 30 may also be made of other materials that are suitably liquid-impermeable or treated to be so. Examples

are meltblown or film material made of polypropylene or polyolefin copolymers such as ethylene vinyl acetate, ethylene methyl acrylate, ethylene ethyl acrylate, polyvinyl chloride, and the like. Other materials include a single spunbonded layer of the above types of materials, two layers of spunbonded and meltblown materials, or three layers of material of spunbonded-meltblown-spunbonded material, each of which is suitably treated or coated to be liquid-impermeable. These same materials may also be provided in laminate form. The spunbond materials provide an added feature of a cloth-like texture to backsheet 30.

Referring to FIG. 6, backsheet 30 may be made of a material that is not only liquid-impermeable, but also vapor-permeable. Alternatively, backsheet 30 can have a breathable panel 92 positioned adjacent or near longitudinal end 50. As illustrated in FIG. 6, breathable panel 92 and loop panel 90 may be coextensive, such that loop panel 90 forms an outer layer for breathable panel 92. However, it may be preferred that panel 92 and panel 90 be separate, i.e., not coextensive. The plurality of loops on loop panel 90 can function as heat-transfer elements that assist in reducing condensation on the diaper exterior.

Other designs include positioning panel 92 in backsheet 30 adjacent or near back longitudinal end 52, or adjacent or near both back longitudinal end 52 and front longitudinal end 50. Breathable panel 92 has a water vapor transmission rate (WVTR) value of at least about 2000 grams/square meter/24 hours. Preferably, panel 92 has a WVTR of at least about 4000 grams/square meter/24 hours, and more preferably has a WVTR of at least about 5000 grams/square meter/24 hours. Breathable panel 92 has a preferred effective breathable area of about 30 cm² and a preferred range of effective breathable area between about 20 to about 600 cm². The term "effective breathable area" refers to that area of breathable panel 92 that does not have any elements, materials or other structure, whether in particulate or fibrous or other form, obstructing or minimizing it that effectively negate its breathable characteristics.

Breathable panel 92 can comprise a microporous polymer film, such as Grade TMP-1 film manufactured by Mitsui Toatsu Chemical, Inc., Tokyo, Japan, a nonwoven fibrous material, such as a spunbonded or meltblown web composed of synthetic polymer fibers, or a calendared, composite, fibrous web which includes a barrier layer comprising fine fibers and a reinforcing layer comprising coarse fibers. The barrier layer and reinforcing layer are securely bonded together by fusing or adhering the reinforcing fibers into the barrier fibers, and the reinforcing layer is configured to conform to the outwardly facing surface of the composite web. If desired, loop panel 90 can serve as the reinforcing layer of breathable panel 92. For purposes herein, a fiber is "fine" if it has a diameter equal to or less than about 3 microns, and a fiber is "coarse" if it has a diameter equal to or greater than about 15 microns.

Breathable panel 92 has a transverse dimension, relative to longitudinal centerline 62, within the range of about 5 to about 25 centimeters, and a longitudinal dimension within the range of about 3 to about 15 centimeters. Panel 92 extends over about 10% to about 50% of the transverse dimension of absorbent structure 14.

Topsheet 26 can be a liquid-permeable, hydrophilic or hydrophobic material, such as a spunbonded web composed of synthetic polymer filaments, a spunlace web; a spunbond-meltblown web, a meltblown web; or a bonded-carded-web composed of synthetic polymer fibers. Suitable synthetic polymers include polyethylene, polypropylene, polyester,

and nylon. In one embodiment, the polymer filaments have a denier within the range of about 1.5 to about 7 d, and preferably within the range of about 1.2 to about 6.0 d. The filaments are arranged to form a layer having a basis weight within the range of about 10 to about 35 gm/m² (gsm), and preferably a basis weight of about 20 gsm. Topsheet 26 has a bulk thickness within the range of about 0.0140 to about 0.0432 centimeters, and preferably within the range of about 0.0180 to about 0.0305 centimeters. The bulk thickness is measured under a restraining pressure of about 0.014 psi.

Topsheet 26 also can be a "KRATON" styrene-butadiene elastomer meltblown/polypropylene spunbond stretch-bonded laminate which has been made wettable by addition of surfactants, a polyurethane spunbond material such as that manufactured by Kanebo Synthetic Fibers Company, Osaka, Japan, and made wettable by addition of surfactants, an elastomeric film made from elastomers such as rubber, latex rubber, polyurethane, "KRATON" styrene-butadiene elastomer, and the like, which has been perforated to allow fluid passage, a polyurethane foam which has been perforated to allow fluid passage; and a nonwoven which has been gathered through the use of elastic or other means, e.g., heat-shrinkable fibers, to produce an elastically stretchable material.

Containment flaps 58 and side flaps 60 can be made of the same material as topsheet 26, and can be integrally formed therefrom or can comprise separate structure joined to topsheet 26 in any suitable manner.

Each containment flap 58 preferably comprises a single layer having a basis weight of about 0.4 ounces per square yard (osy) that is folded upon itself to make a dual-layer flap having a basis weight of about 0.8 osy. For example, containment flaps 58 preferably comprise at least one layer of a nonwoven such as a spunbond, bonded-carded web, or spun-lace material comprised of polymers such as polypropylene, polyethylene, polyester, or nylon. The material is made wettable by the use of surfactants, such as "TRITON" or "AEROSOL OT". An example of such a containment flap is produced by folding a layer of 0.4 osy Triton-treated spunbond polypropylene over an elastomeric material to produce a two-layer flat material.

Elastic members 66 can be any suitable elastic material, such as natural rubber, synthetic rubber, or thermoplastic elastomeric polymers, and can be single or multiple threads or ribbons thereof. Optionally, these materials can be heat-shrinkable or heat-elasticizable. Preferably, elastic members 66 each comprise two strands of 470 Decitex "LYCRA" (Decitex being the weight in grams of a single thread which is 10,000 meters long), and at 90% of ultimate elongation provide a tension between about 25 grams to about 75 grams. The material permits containment flaps 58 to retract from about 30% to about 80% of their elongated length. More preferably, the material has about 50 grams force after one minute hold-time at 90% of ultimate elongation and the ability to retract to at least about 50% of the original length.

Side flaps 60 preferably comprise two layers of 0.8 osy spunbonded polypropylene, and can be liquid permeable, liquid impermeable, or liquid impermeable-vapor permeable. For example, side flaps 60 can comprise at least one layer of a nonwoven, such as a spunbonded, bonded-carded web, or spun-laced material comprised of polymers such as polypropylene, polyethylene, polyester, or nylon. The material is preferably non-wettable (hydrophobic) in nature. This 0.8 osy side flap comprises a layer of 0.8 osy spunbonded polypropylene which is disposed over an elastomeric material to produce a two-layer flap material.

Elastic members 70 can be made of the same material as elastic members 66. Preferably, elastic members 70 each comprise 3 strands of 620 Decitex "LYCRA", and at an elongation of 90% of ultimate elongation provide a tension between about 50 to about 150 grams. The material permits side flaps 60 to retract from about 30% to about 80% of their elongated length. More preferably, the material has about 50 grams force after one minute hold-time at 90% of ultimate elongation and the ability to retract to at least about 45% of the original length.

Stretchable ears 82 can be made of any suitable material having elastic or stretchable properties. Some examples of such materials are a stretch-bonded laminate comprising two gatherable layers of about 0.4 oz polypropylene spunbond having therebetween a layer of meltblown elastic material such as "KRATON" styrene-butadiene elastomer or polyurethane-based polymer. The layer of the elastomeric is stretched and then the two layers of polypropylene are joined thereto and upon relaxing the layers, the two polypropylene layers gather. Other stretch-bonded laminates can be produced from elastomeric film such as "KRATON" styrene-butadiene elastomer or urethane, elastomeric ribbons or threads such as "LYCRA", rubber, "PEBAX", urethane, or combinations thereof. The stretchable ears can also comprise alternative elastomeric materials, such as a stretchable urethane foam or polyurethane spunbond fabric similar to that manufactured by Kanebo. The stretchable ears can be made from a single elastomeric fabric or combinations of several elastomeric fabrics.

The position of hook tabs 88 on stretchable ears 82 and the position of loop panel 90 on backsheet 30 are important to the proper functioning of disposable diaper 10. Loop panel 90 should exclude about 1 1/4 inches of the center of backsheet 30 to provide two loop sub-panels 91, 93. Loop sub-panels 91, 93 should be placed about 1/4 inch from the lateral sides 54 of backsheet 30. This is designed to ensure engagement between hook tab 88 and loop panel 90 in preferred areas. For example, if hook tabs 88 are positioned too near centerline 62 of backsheet 30, that tension created by stretchable ears 82 can cause (1) the elastic material to stretch beyond its elastic limits, (2) front panel 32 to droop or fold-over, and (3) red-markings on the skin; or if hook tabs 88 engage loop panel 90 too near lateral sides 54, that tension created by stretchable ears 82 can cause red marking on the skin. The loop panel width being larger than the width of the hook tab width allows the user some adjustment for baby waist dimension differences. Proper ear tension will improve attachment between the hooks and loops, and can prevent front panel droop caused by low tensions of about 300 grams or less and red marking of the skin or other irritation caused by high tensions above about 1200 grams. Tensions of at least about 100 grams are required to improve attachment between the hooks and loops. Proper ear tensions fall generally within the range of about 300 grams to about 1200 grams to prevent front panel droop.

Preferably, the width of ears 82 should be about 1.5 inches to about 2.5 inches, and the elastic force band should be preferably about 1.25 inches to about 2.25 inches above the front edge of the absorbent pad.

Ears 82 can be designed with higher tensions through the center and lower tensions outside these higher tension bands. Ears 82 also can be designed with uniform tension throughout the material.

Absorbent structure 14 can comprise surge portion 98 and retention portion 100. Surge portion 98 is in liquid communication with retention portion 100, and temporarily stores

up to about 100% of a liquid insult, and subsequently releases liquid to retention portion 100. As illustrated, surge portion 98 is generally rectangular-shaped having a weight range of about 0.5 to about 15 grams of material and a surface area of about 10 square inches to about 50 square inches, and is positioned between the longitudinal ends of absorbent structure 14 and centered along centerline 62. Surge portion 98 overlies retention portion 100, which is of generally hour-glass shape. Other geometric forms and placements of surge portion 98 and retention portion 100 are contemplated by the present invention, such as surge portion 98 being disposed within retention portion 100 to form a single-layer structure. If desired, surge portion 98 can be joined to retention portion 100 by a bonding and/or fiber entanglement mechanism, such as ultrasonic, adhesive, or thermal bonding, or mechanical or hydraulic needling. Surge portion 98 can extend the full length of absorbent structure 14, or can be shorter in length and disposed in or near the front or back of absorbent structure 14.

Absorbent structure 14 can be manufactured in various shapes and with selected absorbent capacities compatible with the size of and the liquid loading imparted by the intended wearer.

A capillary force differential created at the interface between surge portion 98 and retention portion 100 can improve the characteristics of absorbent structure 14. If surge portion 98 has and maintains relatively lower capillary attraction compared to the capillary attraction of retention portion 100, liquid surges will tend to be described more readily from surge portion 98 into retention portion 100.

Retention portion 100 can comprise various types and mixtures of fibrous material. For example, retention portion 100 may comprise cellulosic fluff, synthetic fibers, absorbent gelling materials in the form of particles, fibers, layers and the like, and various mixtures or blends thereof. Suitable absorbent gelling materials can be inorganic materials such as silica gels, or organic compounds such as cross-linked polymers. Some examples of absorbent gelling material polymers include polyacrylamides, polyvinyl alcohol, polyacrylates, and the like. Other acceptable polymers include acrylonitrile grafted starch, acrylic acid grafted starch, modified carboxy methyl cellulose, and the like.

Retention portion 100 can also comprise a mixture of about 1% to about 30% by weight of an inherently wettable polymer, such as "HYDROFIL", polyester, "PEBAX", or wettable polyethylene or polypropylene; about 5% to about 90% by weight absorbent gelling material; and about 20% to about 80% by weight cellulosic fluff. More preferably, retention portion 100 can be about 2% to about 15% by weight of an inherently wettable polymer, about 15% to about 50% by weight absorbent gelling material, and about 45% to about 70% by weight cellulosic fluff. Retention portion 100 can have a basis weight in the range of about 200 to about 3000 gsm. A preferred range is between about 500 to about 1000 gsm. A more preferred basis weight is about 900 gsm. Retention portion 100 can have a density in the range of about 0.08 to about 0.40 g/cc. A preferred range is between about 0.15 to about 0.30 g/cc. A preferred density is about 0.22 g/cc. With respect to the density measurement of retention portion 100, it is calculated from its basis weight and thickness, and is measured on newly unpacked, unfolded, and desiccated diapers.

Surge portion 98 can comprise the same types of materials as retention portion 100. Preferably, surge portion 98 comprises "HYDROFIL" material having a basis weight between about 100 to about 600 gsm, a density between

about 0.05 to about 0.15 g/cc, and a surface area between about 10 to about 50 square inches, i.e., about 64.5 to about 322 centimeters square. Preferably, surge portion 98 has a basis weight of about 400 gsm, a density of about 0.1 g/cc and a surface area of about 25 square inches.

The entire absorbent structure 14 can be wrapped in a hydrophilic web made of the same material as topsheet 26, a wood fiber tissue, or a powder-bonded polyester carded web having a basis weight between about 15 to about 30 gsm.

While this invention has been described as having preferred embodiments, it will be understood that it is capable of further modifications. This application is therefore intended to cover any variations, uses, or adaptations of the invention following the general principles thereof, and including such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains and fall within the limits of the appended claims.

What is claimed is

1. A disposable absorbent article, comprising:

a liquid permeable topsheet including opposite longitudinal ends and opposite lateral sides, said ends and said sides forming a topsheet periphery having a topsheet peripheral measurement, and

a liquid impermeable backsheet including opposite longitudinal ends and opposite lateral sides, said ends and said sides forming a backsheet periphery having a backsheet peripheral measurement greater than said topsheet peripheral measurement, said liquid impermeable backsheet further including a breathable panel positioned adjacent or near a longitudinal end thereof, said topsheet periphery being joined to said greater backsheet periphery to form a waste-containment pocket therebetween,

said liquid permeable topsheet substantially fully contacting the body of the wearer when in use, the percentage of said liquid permeable topsheet in contact with the body being greater than about 70 percent,

said liquid permeable topsheet further defining a hole sufficient to allow solid fecal matter to pass there-through.

2. The article of claim 1 further comprising an absorbent structure located between said liquid permeable topsheet and said liquid impermeable backsheet, said absorbent structure having an overall width of from about 4 to about 7 inches and comprising a crotch portion having a crotch width of from about 2 inches to about 3 inches.

3. The absorbent article according to claim 1 wherein said backsheet is expandable.

4. The absorbent article according to claim 1 wherein said topsheet is stretchable.

5. The article of claim 1 further comprising an absorbent structure located between said liquid permeable topsheet and said liquid impermeable backsheet, said absorbent structure defining a hole having a volume.

6. The article of claim 5 wherein said hole defined by said absorbent structure has a volume of from about 20 cubic centimeters to about 60 cubic centimeters.

7. A disposable absorbent article, comprising

a liquid permeable topsheet having opposite lateral sides,

a liquid impermeable backsheet including a breathable panel positioned adjacent a longitudinal end thereof,

and an absorbent structure being disposed between said liquid permeable topsheet and said liquid impermeable backsheet, said absorbent structure having an overall width of from about 4 to about 7 inches and comprising a crotch portion having a crotch width of from about 2 inches to about 3 inches, whereby said crotch portion fits conformably to the wearer's crotch.

8. The article of claim 7 further comprising a pair of stretchable ears at one longitudinal end of said article, said stretchable ears having one of a plurality of loop members and a plurality of hook members thereon, an opposite longitudinal end of said article having the other of said plurality of loop members and said plurality of hook members thereon.

9. The article of claim 7 wherein said absorbent structure has an overall width less than about 5 inches.

10. The article of claim 7 further comprising a pair of containment flaps positioned at respective ones of said lateral sides of said topsheet, and

a pair of side flaps positioned at respective ones of said lateral sides of said topsheet.

11. The article of claim 10 wherein selected portions of said containment flaps are liquid permeable and remaining portions of said containment flaps are liquid impermeable.

12. The article of claim 10 wherein selected portions of said side flaps are liquid permeable and remaining portions of said side flaps are liquid impermeable.

13. The absorbent article according to claim 7 wherein said backsheet is expandable.

14. The absorbent article according to claim 7 wherein said topsheet is stretchable.

15. The absorbent article according to claim 7 wherein said liquid permeable topsheet defines a hole sufficient to allow solid fecal material to pass therethrough and said absorbent structure defines a hole.

16. The absorbent article according to claim 15 wherein said hole defined by said absorbent structure has a volume of from about 20 to about 60 cubic centimeters

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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

2020

Bogotá, D. C., 20 de Octubre de 2005

Doctor

RAMIRO CASTRO DUQUE

Representante **KIMBERLY – CLARK WORLDWIDE INC.**

ASUNTO	Radicación No.	00-76261
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	9927
	Folios	072

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica

1) Documentos estudiados:

- a) Para el presente estudio se tendrán en cuenta el capítulo descriptivo, comprendido en los folios 5 a 31 de la solicitud en estudio.
- b) Para el presente estudio se tendrán en cuenta los dibujos comprendidos en los folios 52 a 59 de la solicitud en estudio.
- c) Para el presente estudio se tendrá en cuenta el capítulo reivindicatorio que comprende 20 reivindicaciones en los folios 65 a 70 de la solicitud en estudio.
- d) Conforme lo establece los artículos 9, 10 y 11 de la decisión 486 de la Comisión de la Comunidad Andina, la presente solicitud en estudio fue presentada el 6 de octubre de 2000, y en el momento de la radicación N se reclamo prioridad alguna

2) Objeto de la Invención

- a) Las reivindicaciones 1 a 20 de la solicitud en estudio se refieren a
 - i) (1.-) Un artículo absorbente que comprende: a) una porción frontal que tiene un primer extremo, un segundo extremo, un primer borde lateral y un segundo borde lateral; b) primera y segunda secciones laterales unidas en forma liberable a la porción frontal, cada una de las primera y segunda secciones laterales que tienen un borde exterior; c) una porción posterior que tiene un primer extremo, un segundo extremo y primer y segundo bordes laterales, la porción posterior que está dividida en una primera sección y una segunda sección, la primera sección que tiene una longitud L2 medida perpendicularmente desde el primer extremo de la porción posterior hasta una línea dirigida paralela, y la segunda

sección que tiene una longitud L3 medida perpendicularmente desde el segundo extremo de la porción posterior a la línea dirigida paralela al primer extremo por lo cual se establece una relación L2/L3 que varía dentro del rango de entre 0,1 hasta 2; d) una porción de entrepierna que conecta la porción frontal a la porción posterior; y e) un absorbente asegurado a por lo menos una de las porciones frontal, posterior o de entrepierna, cada uno de los bordes exteriores de las primera y segunda secciones laterales que están asegurados a uno de los primer y segundo bordes laterales de la porción posterior para formar un artículo similar a pantaloncito que tiene una abertura de cintura y un par de aberturas de pierna.

ii) (10.-) Un artículo absorbente que comprende...

iii) (15.-) Un artículo absorbente que comprende...

b) Los anteriores productos buscan artículos absorbentes desechables más cómodos para los usuarios.

c) Según la Clasificación Internacional de Patentes, la codificación para esta solicitud corresponde a: A 61F 13/15

3) Claridad de la Solicitud

a) El artículo 30 de la Decisión 486 de la Comisión de la Comunidad Andina establece que

"Las reivindicaciones definirán la materia que se desea proteger mediante la patente. Deben ser claras y concisas y estar enteramente sustentadas por la descripción. Las reivindicaciones podrán ser independientes o dependientes. Una reivindicación será independiente cuando defina la materia que se desea proteger sin referencia a otra reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior.- Una reivindicación que se refiera a dos o más reivindicaciones anteriores se considerará reivindicación dependiente múltiple."

El capítulo reivindicatorio no es claro toda vez que no se precisa la materia sobre la cual se solicita protección. Como se explicará en el punto 4), la presente solicitud no posee unidad de invención, por lo que no está definida la materia sobre la cual se solicita protección.

De acuerdo a lo anterior, el capítulo reivindicatorio no cumple con el requisito de claridad de acuerdo a lo establecido en el Art. 30 de la Decisión 486.

4) Evaluación de la Unidad de Invención

El artículo 25 de la Decisión 486 de la Comisión de la Comunidad Andina establece

"La solicitud de patente sólo podrá comprender una invención o un grupo de invenciones relacionadas entre sí, de manera que conformen un único concepto inventivo"

La presente solicitud carece de unidad de invención toda vez que configura **TRES** diferentes objetos. Aunque se dirigen a **artículos absorbentes desechables** la definición de la materia que caracteriza a cada una de las reivindicaciones independientes (1, 10 y 15) es muy diferente entre sí. Esto permite afirmar que no se trata del mismo producto. Todo el problema radica en configurar varias reivindicaciones independientes con materia diferente. El solicitante debe establecer una sola reivindicación independiente dirigida al **producto** en la forma más simple de la solicitud de invención. Partiendo de allí establecer reivindicaciones dependientes que amplíen esa forma más simple hasta su forma más compleja.

De acuerdo a lo anterior, la presente solicitud no cumple con el requisito de unidad de invención de acuerdo al Art. 25 de la Decisión 486.

5) Determinación del Estado de la Técnica

El artículo 16 de la Decisión 486 de la Comisión establece:

"El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

"Sólo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica, el contenido de una solicitud de patente en trámite ante la oficina nacional competente cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o de prioridad de la solicitud de patente que se estuviese examinando, siempre que dicho contenido este incluido en la solicitud de fecha anterior cuando ella se publique o hubiese transcurrido el plazo previsto en el artículo 40."

Consultadas las bases de datos y los archivos con que cuenta la entidad, especialmente bajo las clasificaciones **A 61 F 13/15** y las más cercanas a ellas, se encontró que antes del 4 de octubre de 2000 (fecha para determinar el estado de la técnica) habían sido publicados los documentos que se enumeran en la siguiente tabla los cuales se relacionan con artículos absorbentes desechables

De acuerdo con lo establecido en el artículo 16 se determinó el estado de la técnica y se encontró el siguiente antecedente:

Nº	Documento	Título	Fecha de Publicación
D1	WO 9736566	Elastomeric side panel for use with convertible absorbent articles	1997.10.09
D2	GB 2288313	Pants type diaper or sanity panty	1995.10.18
D3	GB 2308290	Reclosable absorbent garments	1997.06.25
D4	US 5527302	Conformable absorbent article	1996.06.18

6) Evaluación de los requisitos de patentabilidad

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Los Países Miembros otorgarán patentes para las invenciones, sean de producto o procedimiento, en todos los campos de la tecnología, siempre que sean nuevas tengan nivel inventivo y sean susceptibles de aplicación industrial".

En cumplimiento con este artículo, se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicación industrial con el fin de establecer la patentabilidad de la invención reivindicada en la solicitud en estudio.

a) Evaluación del Nivel Inventivo

El art. 18 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Se considerará que una invención tiene nivel inventivo, si para una persona del oficio normalmente versada en el arte en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica".

Cada uno de los documentos citados en el cuadro del punto 5) muestra en esencia las mismas partes enumeradas en el documento CO - 0075409 en el capítulo reivindicatorio. Aunque las relaciones no se encuentran de forma explícita, para un técnico medio resultan obvias, toda vez que la conformación típica del pañal exige esas proporciones. Resulta evidente para cualquier técnico tomar lo revelado en cada una de dichas anterioridades y llegar a lo que pretende el solicitante se le ampare.

b) Resumen

En conclusión los requisitos de patentabilidad de la presente solicitud se podrían ver afectados así:

Nº	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	WO 9736566	1 - 20	Nivel inventivo
D2	GB 2288313	1 - 20	Nivel inventivo
D3	GB 2308290	1 - 20	Nivel inventivo
D4	US 5527302	1 - 20	Nivel inventivo

7) Notificación

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que dentro del término de sesenta días contados a partir de la fecha de la notificación de la presente comunicación debe responder a la notificación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

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Notifíquese el presente oficio conforme a lo dispuesto por el numeral 5.2, literal e) del capítulo quinto del título primero de la Circular Única N° 10 de 2001


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en la lista, de fecha

27 OCT. 2005

Concepto Técnico N°	EXAMINADOR TÉCNICO Código No.	EXAMINADOR JURÍDICO Código No.
1650	202003	

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

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RADICACIÓN: 0-76261

EDICTO No. 2925

**LA SECRETARÍA GENERAL AD-HOC
HACE SABER:**

Que esta Superintendencia profirió Resolución No. 1995 de 31-ENE-2006. Que el contenido de la parte resolutive es como sigue: El Superintendente de Industria y Comercio.

RESUELVE

ARTICULO PRIMERO: Negar el privilegio de patente de invención para la solicitud correspondiente a "ARTICULO ABSORBENTE DESECHABLE QUE TIENE UN MECANISMO RESUJETABLE".

ARTICULO SEGUNDO: Notificar personalmente el contenido de la presente resolución al doctor Ramiro Castro Duque, o a quien haga sus veces, en su calidad de apoderado de Kimberly-Clark Worldwide, Inc., entregándole copia de la misma, advirtiéndole que contra ella procede el recurso de reposición interpuesto ante el Superintendente de Industria y Comercio, al momento de la notificación o dentro de los 5 días hábiles siguientes a ella.

NOTIFIQUESE Y CUMPLASE
Dada en Bogotá, D.C., a los **31** ENE. 2006

EL SUPERINTENDENTE DE INDUSTRIA Y COMERCIO,


JAIRO RUBIO-ESCOBAR

Para notificar a los interesados, se fija el presente EDICTO en lugar visible al público en la SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO, por el término de (10) diez días hábiles contados a partir de las 8:30 a.m. de hoy.

Secretaría General Ad-Hoc 21-FEB-2006 Este edicto se desfija hoy 06-MAR-2006 a las cinco (5:00 p.m.)
Secretaría General Ad-Hoc
EDICTO No. 2925