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(54) Title: TWO-PIECE ABSORBENT ARTICLE WITH AN INSERT PIECE HAVING TWO ENDS OF DIFFERENT WIDTH

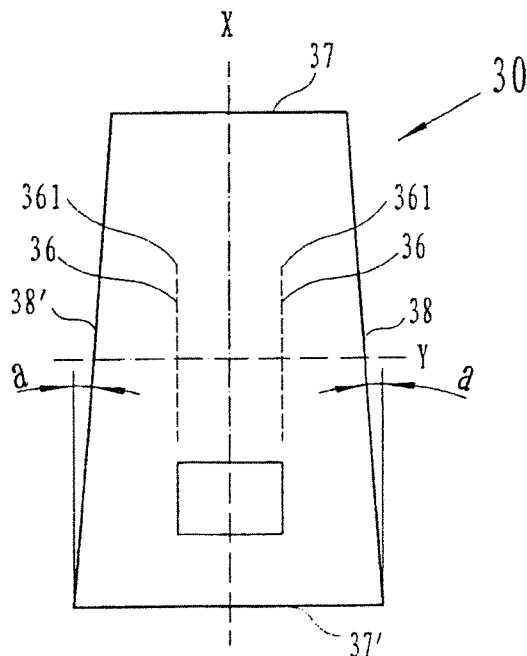


Fig. 1

(57) Abstract: The present invention is related to an insert
piece of a two-piece absorbent article, comprising a liquid im-
permeable outer sheet, a liquid permeable inner sheet, and an
absorbent core positioned between the outer sheet and inner
sheet, two ends and two straight side edges, said two ends of
the insert have different widths, such that the side edges forms
an angle of 2α . The angled sides make it possible to adjust the
product to fit the user's individual anatomy.



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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

TWO-PIECE ABSORBENT ARTICLE WITH AN INSERT PIECE HAVING TWO ENDS OF DIFFERENT WIDTH

TECHNICAL FIELD

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The present invention is directed to a hygiene product, in particular, a two-piece absorbent article with an insert piece having two ends of different width.

BACKGROUND ART

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Reusable diapers made of cloth have been in use for many years. However, reusable cloth diapers have disadvantages relating to labor costing in handling and the need for effectively laundering and sanitizing soiled diapers for re-use.

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The introduction of disposable diapers in recent decades has resolved those problems to some extents. Generally, after use a soiled disposable diaper may be discarded as it is, without any need of laundering or sanitizing. Additionally, many types of disposable diapers currently available are believed to be superior to cloth diapers at conveying and storing urine away from the skin and/or protecting the skin with skin care compositions, thereby helping to avoid skin conditions such as diaper rash.

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For economic reasons, currently most disposable diapers are made of substantial proportions of materials derived from petroleum, such as polypropylene and/or polyethylene. These materials often appear in the form of nonwoven webs, sheets or films.

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In recent years concerns have arisen concerning the environment. The manufacture and use of diapers is not an exception, particularly in view of the growing number of babies. One view seems to be that use of disposable diapers is detrimental to the environment because the materials of which they are typically made may be derived from non-renewable resources and require substantial amounts of energy in their manufacture. Additionally, because disposable diapers typically are not re-used or recycled, their use may be deemed by some to be unsatisfactorily taxing upon disposal facilities such as landfills.

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Two-piece type absorbent articles have been known in the art for quite a few years. For example, WO2010/083290, WO2010/083287, WO2010/083260 and WO2010/083293 disclose a two-piece absorbent article comprising an outer cover and an absorbent insert, wherein the insert may have containment and absorption features that prevent
5 soiling of the outer cover by the wearer's exudates, so that the outer cover may be reused after an exudation event and change of inserts, and the insert and/or the outer cover may have features to enhance containment, absorption, economy of materials and/or fit that make them asymmetric about their respective lateral axes, and may have features that direct a user to install the insert and/or the outer cover with correct front-
10 rear orientation relative to the wearer.

In view of the concerns set forth above, it would be advantageous if a wearable absorbent article were available that provides advantages desired by caregivers, while reducing the respective disadvantages. It also would be advantageous if a construction
15 were provided that could simplify manufacturing processes and/or reduce costs.

SUMMARY

The present invention is directed to an insert piece 30 of a two-piece absorbent article
20 1, comprising a liquid impermeable outer sheet 31, a liquid permeable inner sheet 32, and an absorbent core 33 positioned between the outer sheet 31 and inner sheet 32, the insert piece having two ends 37, 37' and two straight side edges 38, 38', wherein said two ends of the insert piece 37, 37' have different widths, such that the side edges 38, 38' form an angle of 2α .

25 In one embodiment, the angle α is in the range of 5° and 12° , preferably in the range of 6° to 10° , and further preferably in the range of 7° to 8° .

30 In one embodiment, the insert piece 30 further comprises an absorbent distribution layer 34 positioned between the inner sheet 32 and the absorbent core 33. Preferably, the absorbent distribution layer 34 has a color different from that of the inner sheet 32 of the insert piece to serve as an indication of the preferred wetting area. Alternatively, in one embodiment, the inner sheet 32 of the insert piece has a mark to indicate the preferred wetting area.

35 In one embodiment, the insert piece 30 further comprises a fastening system 36 having components 361 configured to releasably attach to correspondent components 261 in a

main piece 20 of the two-piece absorbent article 1.

In one embodiment, the length between two ends 37, 37' of the insert piece is at least about 30cm, preferably at least about 35cm, and most preferably at least about 37cm.

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In one embodiment, the outer surface of the outer sheet of the insert piece has a coefficient of friction against the inner surface of the inner sheet of the main piece of at least 1.0, more preferably at least 1.5, more preferably at least 1.8, and most preferably at least 2.0.

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The present invention is further directed to a two-piece absorbent article 1, comprising any one of the insert pieces 30 as illustrated above, and a main piece 20 comprising a liquid impermeable outer sheet 21, and a liquid permeable inner sheet 22.

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In one embodiment, the main piece 20 further comprises any one or more of the following components: an absorbent core 23 positioned between the outer sheet 21 and inner sheet 22, an absorbent distribution layer 24 positioned between the inner sheet 22 and the absorbent core 23, a standing gather 27 close to the side edge of the main piece, and a fastening system 25 for fixing the two-piece absorbent article 1 on the user at a

20

In one embodiment, the main piece 20 further comprises a fastening system 26 having components 261 configured to releasably attach to correspondent fastening system components 361 in the insert piece, and the insert piece 30 further comprises a

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fastening system 36 having said components 361 being releasably attachable to the corresponding components 261 in the main piece 20.

BRIEF DESCRIPTION OF THE DRAWINGS

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Figure 1 is a plan view of a flatly laid insert piece separated from the main piece, with the inner surface facing the viewer.

Figure 2 is a section view of the insert piece in Figure 1.

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Figure 3 is a plan view of the main piece to be used together with the insert piece, with the inner surface facing the viewer.

Figure 4 is a section view of the main piece in Figure 3.

Figure 5 illustrates a way of joining the insert piece with the main piece.

5 DETAILED DESCRIPTION

Definitions

For the purposes of this description, the following terms have the meanings set forth:

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“Insert piece” used herein refers to a component of an absorbent article that is adapted to contain and/or absorb urine, feces, menses or any combination thereof, and is adapted to be installable and removable as a modular unit, from a main piece of the absorbent article.

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“Main piece” used herein refers to a component of an absorbent article that is adapted to be worn at the lower torso of a user, and is adapted to support an insert piece and hold the insert piece next to the user's body. The main piece can also be adapted to contain and/or absorb urine, feces, menses or any combination thereof. Alternatively,
20 the main piece can be constructed without any absorbent function.

“Fastening system” used herein refers to a system that effects removable fastening, attachment or holding of a first structure to a second structure. The system may have a single fastener component, for example, an adhesive patch on the first structure adapted to adhere to one or more types of surfaces on the second structure, or a hook or patch of
25 hooks on the first structure adapted to catch on one or more types of surfaces on the second structure. By way of illustration, any structure such as a pocket, strap, hook, buckle, etc. on a first structure adapted to capture and retain, in whole or in part, the second structure, is a “fastening system” as used herein. The system also may comprise two or more fastener components, for example, respective components of a hook-and-loop fastening system (such as VELCRO), respective surfaces having a cohesive material applied thereto; male and female snap fastener components, a button and button hole, slot or loop, other fastenably cooperating elements, etc. Other examples of
30 fastening components include zipper components, “zip lock” engaging components, loops, posts, pockets, bands or straps, microfasteners, macrofasteners, and fastening
35 components such as described in WO1998/029081, WO2002/047597 etc.

“User” used herein refers to a person who may wear an absorbent article as described herein.

Figure 1 illustrates the plan view of the present insert piece to be used as part of the two-piece absorbent article. Figure 2 is the section view of the insert piece. As illustrated, the insert piece is flatly laid with the inner surface facing the viewer. The present insert piece comprises a liquid impermeable outer sheet 31, a liquid permeable inner sheet 32, and an absorbent core 33 positioned between the outer sheet 31 and inner sheet 32, two ends 37, 37' and two straight side edges 38, 38'. The present insert piece 30 has a longitudinal X axis equally dividing the width of the insert piece, and has a lateral Y axis which is substantially perpendicular to X axis and which equally divides the length along X axis of the insert piece between two ends 37, 37'. Said two ends of the insert 37, 37' have different widths, such that the side edges 38, 38' form an angle of 2α . In a preferable embodiment, each of the edges 38, 38' form an angle of α with the longitudinal X axis.

“Longitudinal” or variants thereof, with respect to a user, refers to along a direction generally extending from the front to the rear of the user, or vice versa. With respect to a component of an absorbent article, “longitudinal” or variants thereof means along a direction generally extending along the component as it would be properly worn on a user, from the front to the rear of the user, or vice versa.

“Lateral” or variants thereof, with respect to a user, means along a direction generally perpendicular to or transverse the direction extending from the front to the rear of the wearer, or vice versa. With respect to a component of an absorbent article, “lateral” or variants thereof means along a direction generally perpendicular to or transverse the direction extending along the component as it would be properly worn on a user, from the front to the rear of the user, or vice versa.

30 Liquid impermeable outer sheet

The liquid impermeable outer sheet is a sheet that liquids, such as urine, will not pass through, under ordinary use conditions, in a direction generally perpendicular to the plane of the sheet at the point of liquid contact. The liquid impermeable outer sheet 20 and 30 can be a single layer of liquid impermeable material, or can be a multi-layered laminate structure in which at least one of the layers is impermeable to liquid. As known in the art, the liquid impermeable outer sheet can include a layer of liquid

permeable material and a layer of liquid impermeable material that are suitably joined together by a laminate adhesive. The adhesive can be applied continuously or intermittently as beads, a spray, parallel swirls, or the like. Suitable adhesives are well known in the art and commercially available. For example, such adhesives can be
5 obtained from Henkel AG & Co., Germany, or from 3M Corporation, MN, USA. The liquid permeable material can be any suitable material that provides a generally cloth-like texture. One example of such a material is a 20 gsm (grams per square meter) spunbond polypropylene nonwoven web. The liquid permeable material may also be those materials of which liquid permeable inner sheet are made. Further, it is not a
10 necessity for the outer layer of the multiple-layer liquid impermeable outer layer to be liquid permeable, but it is desired that it provides a relatively cloth-like texture to the user.

The liquid impermeable outer sheet is preferably formed by a sheet material having
15 moisture permeability from the viewpoint of preventing stuffiness.

Liquid permeable inner sheet

The liquid permeable inner sheet is a liquid-permeable nonwoven fabric that is shaped
20 to cover a surface of the insert piece having contact with skin. Natural fiber or synthetic fiber can be used for nonwoven fabric that consists the inner sheet. Natural fiber includes cotton, cellulose (wood pulp), wool, or silk for example. Synthetic fiber may include, for example, polypropylene (PP), polyethylene (PE), nylon, polyester (PET), or acryl. Synthetic fiber may also include PE/PP-mixed nonwoven fabric, PE/PET-
25 mixed nonwoven fabric, or bicomponent fiber (mixed fiber) obtained by appropriately combining the above materials.

Absorbent core

30 The absorbent core is a part capable of absorbing and retaining liquid. There is no particular limitation to the type of material constituting the absorbent core, as long as it is capable of absorbing and retaining liquid. As known in the art, for example, the absorbent core is made of a mixture of a fibrous material and a superabsorbent polymer. In this example, the high-absorbent polymer is retained within the fibrous
35 material. In a preferable embodiment, all the mixture of a fibrous material and a superabsorbent polymer can be retained in a wrap tissue. In another preferable embodiment, the mixture of a fibrous material and a superabsorbent polymer is divided

into two parts, and each one is retained in a wrap tissue having a cross section perpendicular to the plane of the outer and inner sheet respectively.

The high-absorbent polymer (SAP) is a polymer that can absorb and retain extremely large amounts of a liquid relative to their own mass. A factor of a SAP's ability to absorb water is the ionic concentration of the aqueous solution. In deionized and distilled water, a SAP may absorb 500 times its weight (from 30–60 times its own volume), but when put into a 0.9% saline solution, the absorbency drops to about 50 times its weight. The total absorbency and swelling capacity are controlled by the type and degree of cross-linkers used to make the SAP. Low density cross-linked SAP generally has a higher absorbent capacity and swells to a larger degree, while high cross-link density polymers exhibit lower absorbent capacity and swell.

There is no particular limitation to the plan-view shape of the absorbent core. For example, the shape of the absorbent core may be a square, a rectangle, a rhombus, or a circle or a rectangle whose corners are rounded and whose sides each take the form of a gentle curve so as to be slightly convex in an outward direction. Further, two or more of these shapes may be used in combination.

The absorbent core is disposed between the outer sheet and the inner sheet of the insert piece, across the planar direction thereof. The absorbent core can be secured to the outer sheet or the inner sheet with adhesive. The adhesive can be applied continuously or intermittently as beads, a spray, parallel swirls, or the like. Suitable adhesives are well known in the art and are commercially available, for example, can be obtained from Henkel AG & Co., Germany, or from 3M Corporation, MN, USA. The absorbent core can be secured through respective fixing points in such a design that the shape of the absorbent core is not deformed upon stretching of the outer sheet.

Generally, the insert piece is substantially even in thickness, such that there is a continuously increasing absorption capacity in the x-direction, from the narrower end to the wider end, as in Figure 1 from left to right.

Acquisition distribution layer

Acquisition distribution layers are well known in the relevant field. Such is a sub-layer designed to improve fluid-management in hygienic products. An acquisition distribution layer accelerates the acquisition and distribution of fluids to the core layer

for increased consumer comfort and discretion. It is generally bulky, soft, and three dimensional to promote body fluid distribution over much of the acquisition distribution layer's surface adjacent to the inner sheet (which in turn is adjacent to the skin of the user) before there is substantial absorption of the fluid by the absorbent core located on the other side of the acquisition distribution layer. Otherwise the fluid would overwhelm the absorption material at the relatively narrow point of absorption rather than being spread over a wide area of the absorption core surface for superior absorption. The acquisition distribution layer can be made by a variety of different processes, such as chemical bonding and thermal bonding, which are well known in the art.

Fastening system

Various fastening systems have been employed for fastening the waistband of an absorbent article around the waist of the user. The fastening device generally includes side tabs attached to the ears of the absorbent article in the rear waistband. The rear waistband overlaps the front waistband as the article is placed on the body of the user and the tabs are fastened onto the front waistband portion holding the absorbent article on the torso. After the absorbent article is soiled, it is removed by unfastening the tabs opening the waist.

In the present invention, a fastening system can also be used to attach the insert piece onto the main piece. In particular, the insert piece may have insert fastening components disposed on the outer sheet of the insert piece, which can releasably attach to corresponding fastening components disposed on the inner sheet of the main piece. The positions of the fastening components of the insert piece and the main piece can be designed such that when insert piece and the main piece are attached together, the outer sheet of the insert piece is substantially even and smooth.

Alternatively, the insert piece may have no fastening components disposed thereon. In one embodiment, the insert piece is simply put onto the main piece, with the outer sheet of the insert piece contacting the inner sheet of the main piece. In this case the insert piece is held to the main piece by frictional force between the outer sheet of the insert piece and the inner sheet of the main piece. Therefore the outer surface of the outer sheet of the insert piece preferably has a high coefficient of friction against the inner surface of the inner sheet of the main piece, preferably at least 1.0, more preferably at least 1.5, even more preferably at least 1.8, and yet even more preferably at least 2.0.

Fastening systems used in the present invention include adhesive fastening systems, such as shown in U.S. Pat. Nos. 3,180,355, 3,630,201, 4,047,530, 4,049,001, and 4,050,453, and mechanical fastening systems, such as hook and loop fasteners shown
5 in EP 0,276,970.

Axis, ends and side edges

The insert piece has a longitudinal X axis equally dividing the width of the insert piece,
10 and has a lateral Y axis which is substantially perpendicular to X axis and which equally divides the length along X axis of the insert piece between two ends (37, 37'), as shown in Figure 1.

The insert piece has two ends 37 and 37', which are depicted at the top and bottom of
15 Figure 1 respectively. These two ends 37 and 37' can be straight lines as shown in Figure 1, or they can be curves, either extruded to the outside of the insert piece or withdrawn to the center of the insert piece, in order to fit the shape of the user's body or the shape of the main piece. These two ends also have different widths along with the lateral Y axis. For example, end 37 may have a width larger than that of end 37'.

The insert piece has two side edges 38 and 38', which are depicted at the top and
20 bottom of Figure 1 respectively. In the present invention, these two side edges 38 and 38' are straight lines as shown in Figure 1. In a preferable embodiment, these two side edges 38 and 38' are symmetrical with respect to X axis.

Since two ends 37 and 37' have different widths along with the lateral Y axis, the side
25 edges 38, 38' form an angle of 2α . In a preferable embodiment, each of the side edges 38, 38' form an angle of α with the longitudinal X axis. The angle α can be in the range of 5° and 12° , preferably in the range of 6° to 10° , and most preferably in the range of
30 7° to 8° .

In the preferable embodiment, the absorbent distribution layer of the present insert
piece has a color different from that of the inner sheet of the insert piece, such as blue or green, thus forming a patch as an indication of the preferred wetting area.
35 Alternatively, in another preferable embodiment, the inner sheet of the insert piece has, for example, a mark, a region in a color different from other regions such as blue or green, or embossments, to serve as an indication of the preferred wetting area.

The insert piece has a length between two ends (37, 37') of at least about 30cm. Preferably, the length is at least about 35cm, most preferably at least about 37cm.

5 Use of the insert product

This insert product is adapted for "double incontinence", i.e. both urine and feces. The present insert is also adapted for absorbing blood.

- 10 It is known that some people have a wider gap between their legs, while some have a narrower gap. Thus the angled sides make it possible to adjust the product to fit the user's individual anatomy.

15 In another aspect, normally the wetting point for a man is more forward than on a woman. Therefore, the present insert piece can have different use configurations for a woman and a man. For example, for a woman, the insert piece can be inserted with the narrow end from the back of the woman, and can be slid forward to the correct position. For men, the insert piece can be inserted the other way around, i.e. with the narrower end from the front of the man.

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Two-piece absorbent articles

25 In another aspect, the present disclosure is further directed to a two-piece absorbent article 1, comprising any of the present insert piece 30 as illustrated above, and a main piece 20 comprising a liquid impermeable outer sheet 21 and a liquid permeable inner sheet 22 (as illustrated in Figure 3). Figure 4 illustrates the section view of the main piece.

30 The liquid impermeable outer sheet 21 and the liquid permeable inner sheet 22 have the same definition as those for liquid impermeable outer sheet 31 and the liquid permeable inner sheet 32 of the insert piece, respectively.

35 The liquid impermeable outer sheet 21 and the liquid permeable inner sheet 22 can be the same as the liquid impermeable outer sheet 31 and the liquid permeable inner sheet 32 of the insert piece respectively, or they can be different. All such embodiments are included in the present disclosure.

In one embodiment, the main piece 20 further comprises any one or more of the following components: an absorbent core 23 positioned between the outer sheet 21 and inner sheet 22, an absorbent distribution layer 24 positioned between the inner sheet 22 and the absorbent core 23, a standing gather 27 close to the side edge of the main piece, and a fastening system 25 to fix the two-piece absorbent article 1 on the user at a suitable position.

Figure 5 illustrates the way that the present insert piece 30 is joined to the main piece 20.

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The absorbent core, absorbent distribution layer, and fastening system have the same definition as that of the absorbent core, absorbent distribution layer, and fastening system of the insert piece, and can be the same as or different from those of the insert piece respectively.

15

The standing gather is a member for preventing side leakage of urine excreted by a user and is constituted so as to serve as three-dimensional leakage-preventing walls by rising. Generally the standing gathers are on the respective sides of the skin-contact inner sheet.

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The disclosures of all patents, patent applications and any patents which issue therefrom, as well as any corresponding published foreign patent applications, and publications mentioned throughout this patent application are hereby incorporated by reference herein.

25

While particular embodiments of the present invention have been illustrated and described, it would be evident to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention as understandable by one skilled in the art on the basis of the present disclosure.

30

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CLAIMS

1. An insert piece (30) of a two-piece absorbent article (1), comprising a liquid impermeable outer sheet (31), a liquid permeable inner sheet (32), and an absorbent core (33) positioned between the outer sheet (31) and inner sheet (32), the insert piece having two ends (37, 37') and two straight side edges (38, 38'),
said two ends of the insert piece (37, 37') having different widths, such that the side edges (38, 38') form an angle of 2α .
2. The insert piece of claim 1, wherein α is in the range of 5° and 12° , preferably in the range of 6° to 10° , and further preferably in the range of 7° to 8° .
3. The insert piece of claim 1, wherein the insert piece (30) further comprises an absorbent distribution layer (34) positioned between the inner sheet (32) and the absorbent core (33).
4. The insert piece of claim 3, wherein the absorbent distribution layer (34) has a color different from that of the inner sheet (32) of the insert piece to serve as an indication of the preferred wetting area.
5. The insert piece of claim 1, wherein the inner sheet (32) of the insert piece has a mark to indicate the preferred wetting area.
6. The insert piece of claim 1, wherein the insert piece (30) further comprises a fastening system (36) having components (361) configured to releasably attach to corresponding components (261) in a main piece (20) of the two-piece absorbent article (1).
7. The insert piece of claim 1, wherein the length between two ends (37, 37') of the insert piece is at least about 30cm, preferably at least about 35cm, most preferably at least about 37cm.
8. The insert piece of claim 1, wherein the outer surface of the outer sheet of the insert piece has a coefficient of friction against the inner surface of the inner sheet of the main piece of at least 1.0, more preferably at least 1.5, more preferably at least 1.8, and most preferably at least 2.0.

9. A two-piece absorbent article (1), comprising the insert piece (30) of any one of claims 1 to 8, and

a main piece (20) comprising a liquid impermeable outer sheet (21), and a liquid permeable inner sheet (22).

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10. The absorbent article of claim 9, wherein the main piece (20) further comprises any one or more of the following components: an absorbent core (23) positioned between the outer sheet (21) and inner sheet (22), an absorbent distribution layer (24) positioned between the inner sheet (22) and the absorbent core (23), a standing gather (27) close to the side edge of the main piece, and a fastening system (25) for fixing the two-piece absorbent article (1) on the user at a suitable position.

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11. The absorbent article of claim 9, wherein the main piece (20) further comprises an fastening system (26) having components (261) configured to releasably attach to corresponding fastening system components (361) in the insert piece, and the insert piece (30) further comprises a fastening system (36) having said components (361) being releasably attachable to the corresponding components (261) in the main piece (20).

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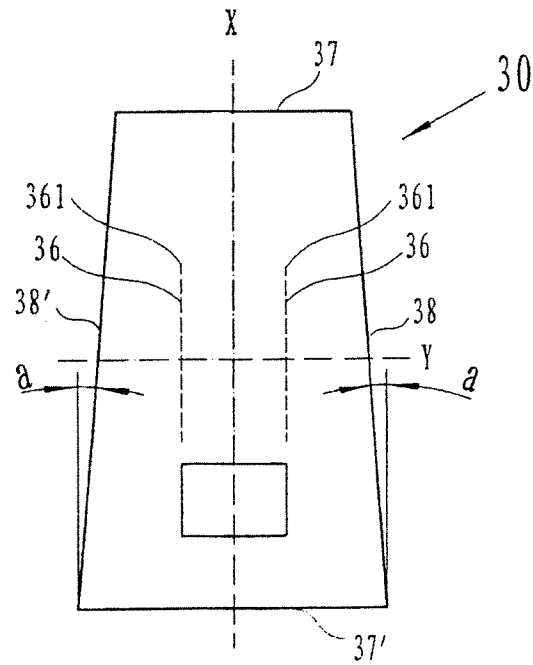


Fig. 1

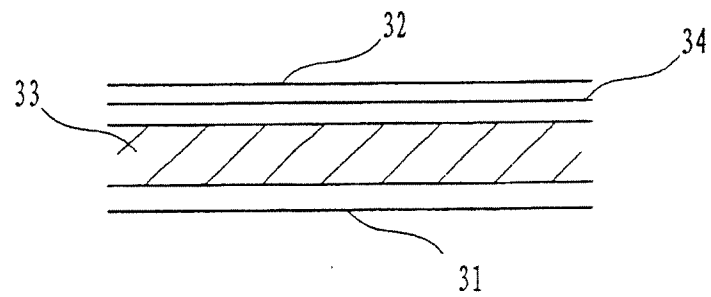


Fig. 2

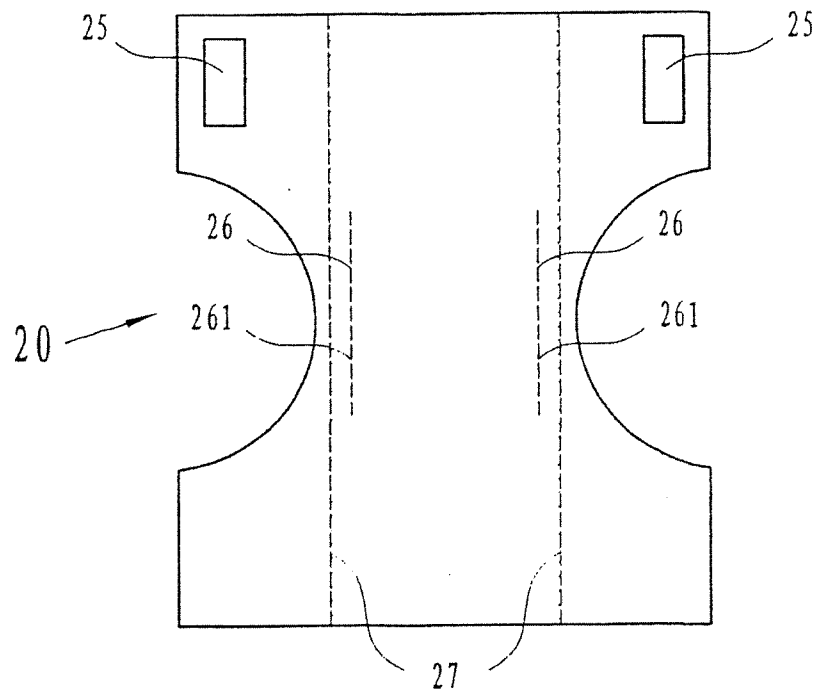


Fig. 3

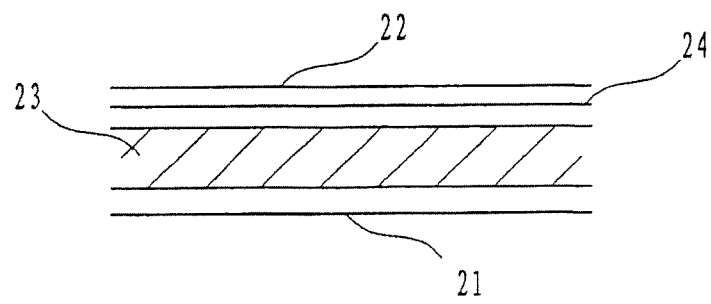


Fig. 4

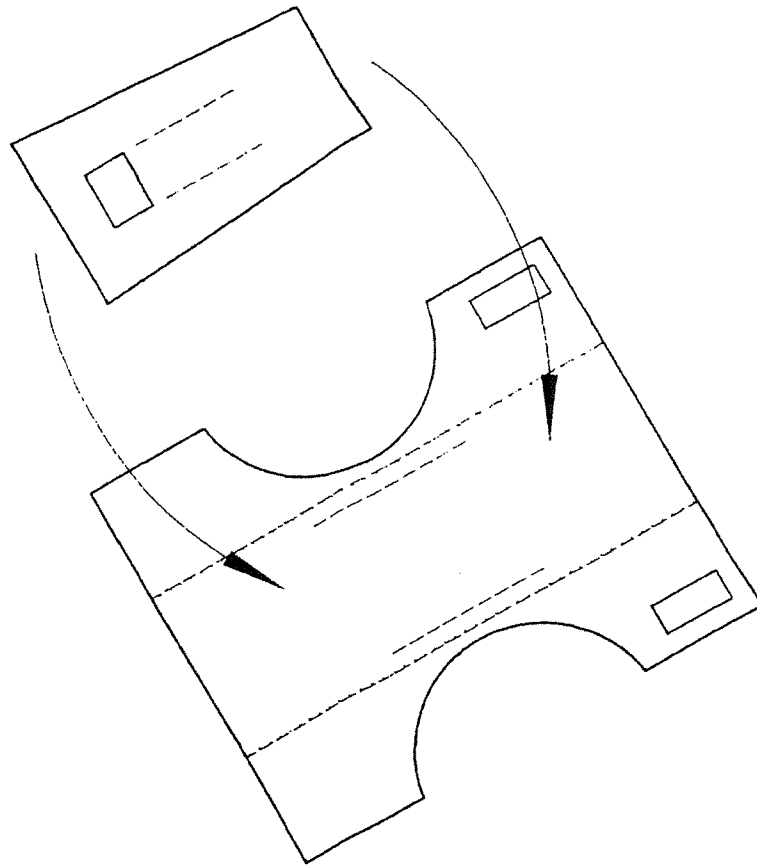


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2013/066460

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61F13/505 A61F13/45 A61F13/472
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61F

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 872 871 A (PROXMIRE DEBORAH L [US] ET AL) 10 October 1989 (1989-10-10)	1,3,6,9-11
Y	figure 4 column 4, line 64 - column 5, line 19 -----	2,4,5,7,8
X	US 5 401 266 A (RUNEMAN BO [SE] ET AL) 28 March 1995 (1995-03-28)	1,3,6,9-11
Y	figures 1-3 column 1, line 5 - column 1, line 11 column 2, line 26 - column 2, line 39 -----	2,4,5,7,8
Y	US 3 747 602 A (RALPH H) 24 July 1973 (1973-07-24) figures 1,2 column 1, line 6 - column 1, line 67 column 2, line 8 - column 2, line 55 ----- -/--	1-11



Further documents are listed in the continuation of Box C.



See patent family annex.

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

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Date of the actual completion of the international search

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Y	DE 100 32 970 A1 (ZISSEL SANDRA [DE]; TIGUENMAS ABDELGHANI [DE]) 28 December 2000 (2000-12-28) figures 1-3 -----	1-11

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Information on patent family members

International application No

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