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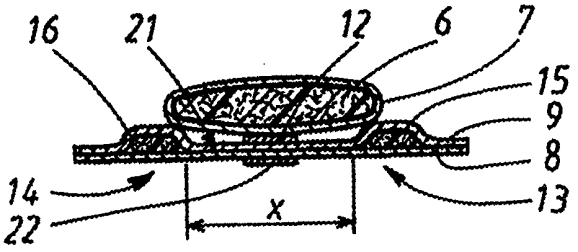
(54) Title: ABSORBENT PRODUCT WITH LATERALLY MOVABLE PORTIONS

(57) Abstract

Absorbent product (1; 101, 201) such as an incontinence pad, for absorbing bodily exudates, the absorbent product having a central absorbent portion (2; 102; 202) and a fluid-impermeable back sheet. The central absorbent portion (2; 102; 202) is attached to two lateral portions (13, 14; 113, 114; 213, 214) by means of a joining area (21) which includes at least the back sheet. In the product, the stiffness of each lateral portion (13, 14; 113, 114; 213, 214) and the central portion (2; 102; 202) is much greater than the stiffness of the joining area to thereby allow the lateral portions to move laterally with respect to the central portion when the central portion is held against movement. In this way, the lateral portions are given freedom to move in at least a lateral direction whilst the central portion can be fixed to a user's undergarment.



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Title: Absorbent product with laterally movable portions

Field of the invention:

The present invention relates to an absorbent product such as an incontinence pad, a sanitary pad, a diaper, another absorbent garment, or an absorbent inlay for such a garment, or the like, for absorbing bodily exudates. In particular, but not exclusively, the invention relates to absorbent products which are disposable after use (i.e. of the type which have materials which are not intended to be washed and used several times). Still more particularly, the invention relates to incontinence products, especially for use by adults, primarily but not exclusively for adult feminine use.

Background to the invention:

Typically, absorbent products of the above-mentioned type have an absorbent core surrounded by an envelope comprising a fluid-impermeable sheet or layer (commonly referred to as a back sheet) and a fluid-permeable sheet or layer (commonly referred to as a liner, top sheet or bodyside layer). In order to provide relatively fixed positioning of such products with respect to the wearer´s undergarment, friction-increasing means, such as one or more strips of pressure sensitive adhesive or the like, are applied to the outer surface of the back sheet. The presence of the friction-increasing means helps to inhibit movement of the absorbent product with respect to the undergarment by frictional engagement therewith. Prior art products of the this type are known in the art.

It is also known to provide prior art absorbent products with elastication in the areas of the product adjacent the wearer's legs. In such a way a better, or tighter, fit of the product can be achieved and prevention of leakage of bodily fluids is improved. However, in many types of absorbent product, the elastication can be problematic.

In a feminine incontinence pad, for example, during the wearer's movements (such as walking or sitting down), a further problem may arise since the outer surface of the central part of the absorbent product is held essentially in place against the wearer's undergarment by friction (with or without a friction-increasing means being used) and also against the wearer's genitals by friction, whilst the edge portions of the absorbent product are further held by friction against the inner regions of the thighs for example. Thus when the wearer moves, although elastication (if present) may provide a reasonable seal against leakage while still allowing for movement, the wearer may experience discomfort due to the opposing forces at the central portion and the outer portions, which tends to twist the product. Additionally, a further problem may arise in that, due to the wearer's movements, openings at the side edges of the product may indeed be created, or enlarged (if openings are already present), which can lead to undesirable leakage.

The aforementioned problem is often made worse by the use of the aforementioned friction-increasing means, such as pressure-sensitive adhesive, on the back sheet of absorbent products for fixing the central position of the product with respect to the undergarment. This is because slippage between the product and the wearer's undergarment is substantially prevented. However, such friction-increasing means is generally desirable, per se, since there are other

advantages in maintaining the central part of the product in a fixed position in the undergarment.

Additionally, since the human anatomy varies greatly, also in the crotch region where said absorbent products are worn, it is desirable to create absorbent products which can adopt different dimensions (e.g. different lateral widths).

An object of the invention is therefore to create a product which allows for movement of the side portions relative to the central portion, in particular when the central part of the product is fixed to said undergarment.

Such movement allowance may be largely a lateral movement allowance, although a longitudinal relative movement allowance may also be provided. In particular therefore, a further object of the invention is to provide an absorbent product which has means allowing a significant variation in the width thereof (i.e. in the lateral direction of the product), whilst preferably also providing some degree of longitudinal relative movement.

It is furthermore not only desirable that the product is able to adopt different lateral widths, but also that it should be able to adopt these different widths in an automatic manner during use, so as to adapt to any variations in, for example, the distance between the wearer's thighs as a result of body movements (e.g. walking). Where such adaptation is provided, the absorbent product is more easily able to prevent leakage of bodily fluids at the sides, since the lateral portions of the product can be held in contact with the user's body (e.g. the user's thighs).

It is therefore another object of the invention to provide an absorbent product which can adapt its width automatically to the width dimensions of the wearer.

A further problem which presents itself in absorbent products is that the bodily fluid to be absorbed by the product is absorbed at only the upper absorbent surface of the product. Thus, where the flow volume is large and quick, such as with flash incontinence, the absorption characteristics of the absorbent material at the bodyside surface of the product may be such that the absorbent material cannot absorb the fluid fast enough. If such is the case, the fluid can overflow laterally over the edges of the absorbent core. This increases the danger of leakage if the overflow fluid cannot be contained within the side regions of the product to allow sufficient time for absorption. Although the core can be made wider to help alleviate this problem, a wider core implies extra material costs and weight.

It is therefore a further object of the invention to provide an absorbent product which preferably has improved absorption characteristics and, in particular, a better rate of absorption.

In order that absorbent products conform better to the shape of users, and in particular to the shape of a user's genitals, it is often desirable to form absorbent products with a bowl or basin shape therein. Such a shape improves comfort.

Prior art solutions to said problem involve manufacturing methods including moulding articles into a basin-shape, or methods in which basin-shaped inserts are fitted into the absorbent products to hold said products in the desired shape. Further solutions are known in which parts of the

sides of said products are provided with elastication to pull the product into the desired shape. However products formed in these ways typically involve manufacturing complications. Moreover such products do not naturally lie flat unless forces are applied to them to hold them flat, which can lead to packaging difficulties.

A further object of the present invention is therefore preferably to provide an absorbent product having a basin-shaped form therein, in a way which provides an improvement over the prior art. Similarly, said product should be capable of being manufactured as a substantially flat article, yet simply transformable into a basin-shape.

Further problems which can be solved by this invention with respect to known absorbent products will become apparent from the following description.

Summary of the invention:

The present invention provides a solution to the aforementioned objects. A solution to at least some of the above objects is provided by an absorbent product having the features defined in claim 1.

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

It should be understood that the term "friction-increasing means" as used herein, is intended to imply either a surface texture, or a formation on, or coating of, or treatment of, a sheet or layer which has the effect of increasing the resistance of the sheet (and thus the absorbent product) to movement with respect to a user´s undergarment, or alternatively with respect to a liner chassis, when in contact therewith. A pressure-sensitive adhesive is a suitable example of such a friction-

increasing means, although different types of adhesive or other sheet treatments will be apparent to a skilled man.

Where particular dimensions are specified in the following description, it will be clear to the skilled man that the widths and lengths of the various components may also be varied in order to suit the particular circumstances. For example, the width and length of the friction-increasing means may vary widely, although typically the width of bands of adhesive may vary between about 4 mm up to several centimetres.

The expression "substantially void of the absorbent and/or hydrophobic material of said central and lateral portions", as used to describe the joining area in the present invention, is intended to distinguish three distinct and separated absorbent portions in the product, yet to allow very thin sheets of absorbent material to be present in the joining zone. Thus the word "substantially" in said expression is used to take account of the case where, for example, the material of the top sheet is itself absorbent. A further case which is intended to be accounted for by this expression is where a very thin sheet of absorbent material is present in the joining zone (i.e. a sheet which is less than about 10% of the thickness of the lateral absorbent portions).

Similarly where the stiffness of the lateral portions and the central portion are described as having a stiffness which is "much greater" than that of the joining zone, this is intended to mean that the stiffness of each of the central and lateral zones is at least 30% greater, preferably 50% greater and more preferably approaching values lying between 80% to 95% greater than the stiffness of the joining area. Any suitable measurement method may be used to arrive at such values, such as the modified ASTM D

4032-82 Circular Bend Procedure described in EP-A-0 336 578 for example.

The significance of the stiffness being "much greater" is such that a very low force is presented against lateral forces which operate to move the lateral portions of the product towards the central absorbent portion. Thus, normally, the joining area (i.e. one or more areas joining lateral portions of the product to the central portion) will simply consist of the top sheet and back sheet of the product. These sheets are preferably in direct facing relationship, preferably a contacting relationship, and more preferably a directly-joined contacting relationship, with no additional absorbent or non-absorbent (e.g. hydrophobic) material therebetween.

Brief description of the drawings:

The invention will now be explained in more detail with reference to certain non-limiting embodiments thereof and with the aid of the accompanying drawings, in which:

Fig. 1 is a plan view of an incontinence pad embodying the present invention, with the body-facing side of the product shown uppermost,

Fig. 2 is a cross-sectional view taken on line II-II in Fig. 1,

Fig. 3 is a plan view of a similar product to that shown in Fig. 1, in which elastication has been added at the outer edges of the lateral portions and the central portion is positioned entirely between the lateral (absorbent) portions.

Fig. 4 is a cross-sectional view taken on line IV-IV in Fig. 3.

Fig. 5 shows a plan view of a further embodiment of the invention, in which two longitudinal pleats have been arranged.

Fig. 6 shows a cross section through line VI-VI in Fig. 5,

Fig. 7 shows the product of Fig. 6 in a state where the two pleats have been opened out to form the product into a basin shape.

Fig. 8 shows a sketch indicating the relative movement directions of the three absorbent parts of the product.

In the figures, the cross-sectional views are not drawn to scale for reasons of clarity and thus many parts thereof would appear to be relatively far thinner and normally closer together in practice.

Detailed description of preferred embodiments:

The absorbent product 1 in Fig. 1 is a feminine incontinence pad, or sanitary pad, embodying the present invention. In the plan view shown, the product is in a substantially flat condition. The longitudinal direction of the product runs from the top to the bottom of the page while the lateral direction runs across the width of the product, generally perpendicular to the longitudinal direction.

The product has a central absorbent portion indicated generally by the arrow 2. The central portion 2 contains

a central core 3 of absorbent material with two straight and generally parallel outer longitudinal edges 4, 5 and two end edges. However, the central portion 2 may have other shapes with curved longitudinal edges. The central portion comprises a core of absorbent material 6 (see Fig. 2), such as cellulose pulp, surrounded on all sides by a single liquid/fluid-permeable layer 7. The material of layer 7 can be any suitable permeable material, but particularly those which are comfortable against the skin such as non-woven materials. Non-woven materials of the spunbond type are suitable, such as for example a PP spunbond having a surface weight of 22 gm^{-2}.

The absorbent portion 2 is positioned generally midway between the outer edges of the product 1. The central absorbent portion has an upper body-facing surface and an opposite lower surface.

The product has a single back sheet layer 8, made of liquid/fluid-impermeable and substantially non-elastic material. Materials for such sheets are well known in the art and do not require detailed description. The back sheet 8 should however preferably also have good resistance to tearing and a material such as a polyethylene sheet as used in current absorbent products would therefore be suitable. In certain cases however, elastic materials may be used for the back sheet (and/or top sheet), especially where increased relative longitudinal movement between the central and lateral portions is desired (see below explanation with respect to Fig. 8 for example).

Attached to one side of back sheet 8, at least at the outer periphery thereof, is a fluid-permeable sheet or layer 9. The body-facing side (upper side as depicted) of sheet 9 is connected by suitable means such as adhesive 12 to the sheet 7. The adhesive is shown in Fig. 1 to be present in

three locations along the centreline of the product, although different arrangements may be envisaged, such as a single line of adhesive. The adhesive may be permanent or instead of a type which allows release of the joined components without destroying the material sheets 7 and 9.

The longitudinal outer peripheral edges of the absorbent product 1 are denoted 10 and 11 respectively.

Two lateral portions, generally denoted 13 and 14, are provided below the central absorbent portion 2 and to the sides of its longitudinal axis. These portions may be absorbent or non-absorbent portions, depending on the desired result. The lateral absorbent portions may thus include absorbent material 15, 16 (such as the type used for the central absorbent portion, for instance cellulose fluff), which performs the function of being absorbent and providing a stiffening of the lateral portions. The lateral portions may however instead include non-absorbent and preferably hydrophobic material, which serves to provide stiffening of the lateral portions as well as serving the function of preventing fluid from entering the outer lateral parts of the product. A convenient form of hydrophobic material in such a case would be hydrophobic foam material, which is well known to the man skilled in the art.

In the following, the lateral portions will however be described generally with reference to "absorbent" portions, although hydrophobic non-absorbent portions alone, or even together with the absorbent portions, can be used in the lateral portions of the following embodiments.

The lateral portions 13, 14 have inner longitudinally extending edges 17, 18. The outer edges of the absorbent

material of the lateral portions are denoted 19 and 20 respectively.

The thickness of the absorbent material 15, 16 may vary considerably. Preferably it lies in a range of between 5% and 20% of the central absorbent material 6 thickness. However, the thickness may also be equal to the thickness of the central absorbent core material 6. Thickness will depend largely on the use to which the product is put and since the lateral portions will be a secondary contact surface for exudate flow, they may be designed to be thinner. Since the absorbent material pieces 6, 15 and 16 are all separate, there is no difficulty during production in providing them with different thicknesses and/or absorbent (and/or non-absorbent) materials having differing characteristics.

As will be apparent from the description of the product structure in Figs. 1 to 4 below, a greater absorption rate can be provided compared to absorbent products only having fluid entry via the upper surface, and thus since overflow over the central portion 2 will not always occur, the absorbent portions 15, 16 and 115, 116 can also be kept very thin, of the order of 1 to 4 mm thickness for example (as measured optically in the uncompressed state). However, the stiffness will still be much greater than that of the joining area.

As shown in Fig. 1, the absorbent portions 15, 16 are formed as two substantially half hourglass shapes having straight longitudinal inner edges 17, 18 and curved outer edges 19, 20 respectively. This shape is not a requirement, but is merely preferable for reasons of body comfort.

A joining area indicated by arrow 21, comprises an area of the top sheet 9 and back sheet 8 material extending over a

width approximately equal to "x" as shown in Fig. 2. In this joining area, there is no absorbent material of the central absorbent core or the lateral portions between the top 9 sheet and the back sheet 8. Although the top sheet 9 itself may exhibit some limited absorbency, this is negligible compared to that of the absorbent material 6 for example and thus the joining area can be described as being substantially void of the absorbent material of the central and lateral absorbent portions.

The thickness of the sheets 8 and 9 is as generally used in the art in current commercial products and, as such, the joining area has substantially no self-supporting characteristics (apart from at the locations where the adhesive 12 attaches the central portion 2 to the top sheet 9). In this regard it should also be remarked that there is only a connection of the central part 2 with the top sheet 9 at the central adhesive location 12. Thus, the joining area is free to deform easily by being squashed or crumpled together when the lateral portions 13 and 14 move laterally towards and away from the longitudinal centreline. Similarly, due to the fact that only a central line of adhesive is used in this embodiment, the joining area 21 on either side of the adhesive 12 presents only a low resistance to small longitudinal relative movement between the central and lateral absorbent portions. Thus, allowance for lateral and longitudinal movement has been provided, whilst the central absorbent area can remain still (or as in practice, fixed against a user's undergarment). In this way it will be apparent that the lateral portions can stay in good sealing contact with the user's thighs, or outer groin regions, during body movements causing width changes in said groin region.

In the joining area 21, the top sheet 9 and the back sheet 8 are preferably attached to one another, either locally

just inside the inner longitudinal edges 17, 18 of the lateral portions, or over a wider area between these two edges.

As a simplification of the above embodiment to aid understanding, the same lateral movements have been illustrated in Fig. 8. Fig. 8 namely shows five sections A to E in plan view. Sections A and C are intended to represent the lateral absorbent portions 13, 14 of the above embodiment, section B is intended to represent the part of the central absorbent portion 2 which is attached by adhesive 12 to sheet 9 and sections D and E represent the joining area on either side of the adhesive 12. As will be apparent herefrom, the central section B can remain fixed, whilst the sections A and C can move laterally inwardly and out again, and also longitudinally relative to the section B. These movement directions are shown by the arrows in Fig. 8. As will be clear from this figure, the length (laterally) of the material in the joining area will determine the lateral inward movement that is possible. Typically a length (laterally) of the joining zone would be between preferably about 0.5 cm to 4 cm, but more preferably between 1 cm to 4 cm.

Thus, when section B is secured (against a user's undergarment) sections A and C can move laterally, as well as (to a lesser degree) longitudinally.

In Fig. 2, reference numeral 22 denotes a strip of pressure sensitive adhesive or the like, used to secure the central section of the product to a user's undergarment (not shown) by acting as a friction-increasing means. However, no friction-increasing means is required and the lateral movement (width adaptation) will function equally without such means.

Figs. 3 and 4 shows a similar embodiment to that in Figs. 1 and 2, where like features are represented by the same reference numerals raised by 100. In this embodiment the absorbent core is made narrower and longitudinal elastics 123, 124 have been added. Additionally, the adhesive has been represented by a continuous section 112.

Due to the narrower central absorbent portion, the outer longitudinal edges of the central portion lie inside the longitudinal edges 117 and 118 of the lateral absorbent portions. In this way, the product will be flatter and neater.

In both embodiments shown in Figs. 1 and 2 and Figs. 3 and 4 respectively, the construction allows fluid exudates to penetrate not only the upper surface of the central absorbent and lateral portions, but also to enter the central absorbent portion via its sides and lower surface. Such an arrangement improves absorption rate in the case of exudate flows which cannot be handled purely by the upper surface.

The elastication means 123, 124 in Fig. 3 may be arranged to help form a slightly basin-shaped product and also to form better sealing at the edges of the product. This elastication also provides a certain force tending keep the lateral portions extended away from each other. Thus, when a user is wearing the article and the user's movements require inward and outward lateral movements, the elastication will assist in providing the outward lateral movement, whilst the body movements will provide the inward forces which cause wrinkling or crumpling of the joining area when moving to a narrow width. In this way, the product is able to automatically adjust to varying widths during movement.

Similarly, due to the connections described above with reference to Fig. 8, some independent longitudinal movement of the lateral portions 113, 114 with respect to the central portion 102 will also be possible.

In the embodiment of Figs. 5, 6 and 7, only two sheets are used to envelope the three separate absorbent sections 206, 215, 216, namely top sheet 209 and back sheet 208. A material saving results compared to the previous embodiments and the production process can be simplified in certain respects.

In the flat form of the product as shown in Fig. 5 and 6, two folded areas 229, 230 in the form of pleats are depicted. These folded areas 229, 230 form two joining portions and together comprise the joining area of the lateral absorbent portions to the central absorbent portion.

Each of the two folded (in this case pleated) portions 229, 230 are prevented (i.e. sealed) from opening at their longitudinally outer end regions, by heat seal lines, adhesive lines 225, 226, 227, 228, or the like.

Such an arrangement has the advantage that a bowl shape or basin shape is given to the product when the two lateral portions 213 and 214 are moved laterally outwardly to open the pleats, although due to the sealing at the end regions, the possibility of longitudinal relative movement is essentially lost. However, as will be apparent, automatic lateral width adaptation will still be provided. Such can be enhanced by use of elastics (not shown) as in the previous embodiment.

The aspect of forming a bowl-shaped product is fulfilled when the ends are joined at 225-228 and the lateral

portions 213, 214 pulled out in a direction as shown by lateral outward forces (arrows "Y") on the lateral portions. Said forces will cause the pleats 229, 230 to open out fully in the central region thereof and by a gradually lesser degree along their length up to the areas of the end seals 225-228, whilst the central absorbent portion 2 has no lateral forces applied thereto by said pleat-opening movements. Since the edges 231 and 232 of the pleats however are required to assume a greater length when forces are applied in the direction of arrows Y, the lateral portions 213, 214 attached to the edges 231, 232 will be caused to assume a hollow, arcuate half-bowl or half-basin shape on either side of the longitudinal centreline. In this way, as the outer edges 210, 211 are moved further apart, the product takes on a whole hollow basin shape with curvature both in the lateral as well as in the longitudinal directions. Opening of the pleats in this way produces the basin-shape shown in the cross-sectional view in Fig. 7 for example.

Thus, by this simple arrangement and simple outward force application, the flat product can also be transformed into a basin-shaped product.

If elastication (not shown in this embodiment) is used in the outer edge parts of the lateral portions 213, 214, the elastic will stretch slightly during outward lateral movement. Thus the elastic will provide a certain holding force causing the basin-shaped product to try and maintain the basin shape. However, lateral forces which may be applied by the wearer on the side portions of the article will cause the lateral portions to move inwardly slightly and thus decrease the width of the product. Thus, an automatically variable and width-adapting product is obtained which will have a resilient force therein attempting to maintain its shape.

From the above it will be clear that where friction-increasing means 222 is applied to the central portion 202 for frictional contact with a wearer's undergarment (not shown), this part can remain stable and fixed to the user's undergarment, while the two lateral portions 17 and 18 can move laterally independently of the central portion 2. In this way, better leakage sealing is provided while still maintaining the product in place and in a basin-shape.

It should also be understood that features described in the aforementioned embodiments are intended to be able to form further embodiments of the product shown in Figs. 5 to 7 and such embodiments will be implicit to the skilled man. No further explanation of such is therefore required.

It should be noted that whilst the top sheet and back sheet layers 208, 209, each preferably consist of one single sheet only of thin material, each may include more than one sheet or a laminated structure as long as the overall stiffness does not allow the joining area to prevent lateral and longitudinal movement. Such principles also apply to the previous embodiments of this invention.

Although the invention has been described above with reference to several preferred embodiments thereof, the scope of the invention is not limited thereto but is instead defined by the full scope of the appended claims.

CLAIMS

1. Absorbent product (1; 101, 201) such as an incontinence pad, sanitary pad, diaper, other absorbent garment, absorbent inlay or the like for absorbing bodily exudates, wherein said absorbent product comprises a substantially central absorbent portion (2; 102; 202) and at least a fluid-impermeable back sheet (8; 108; 208), **characterized in that** said central absorbent portion (2; 102; 202) is attached to two laterally-separated lateral portions (13, 14; 113, 114; 213, 214) by means of a joining area (21) which includes at least said back sheet, and in that the stiffness of each of said lateral portions (13, 14; 113, 114; 213, 214) and of said central portion (2; 102; 202) is much greater than the stiffness of said joining area to thereby allow said lateral portions to move laterally with respect to said central portion when said central portion is held against movement.

2. Absorbent product according to claim 1, **characterized in that** said central absorbent portion (2; 102; 202) comprises an absorbent core (6; 106; 206), and in that said lateral portions (13, 14; 113, 114; 213, 214) comprise stiffening material (15, 16; 115, 116; 215, 216) held between a permeable top sheet (9; 109; 209) and said back sheet, and in that said joining area (21) comprises said top sheet (9; 109; 209) and said back sheet (8; 108; 208) and is void of the material of said absorbent core (6, 106, 206) and said stiffening material (15, 16; 115, 116; 215, 216) of said lateral portions (13, 14; 113, 114; 213, 214).

3. Absorbent product according to claim 2, **characterized in that** said top sheet (9, 109, 209) and said back sheet (8; 108; 208) are joined to each other over a substantial portion of said joining area (21).

4. Absorbent product according to any one of the preceding claims, **characterized in that** said lateral portions (13, 14; 113, 114; 213, 214) contain absorbent material (15, 16; 115, 116; 215, 216) to thereby form two lateral absorbent portions, said absorbent material being positioned between said top sheet and said back sheet, and in that said joining area (21) is substantially void of the absorbent material of said central and lateral absorbent portions.

5. Absorbent product according to any one of claims 2 or 3, **characterized in that** said lateral portions (13, 14; 113, 114; 213, 214) contain hydrophobic material (15, 16; 115, 116; 215, 216) to thereby form two lateral stiffened hydrophobic portions, said hydrophobic material being positioned between said top sheet and said back sheet, and in that said joining area (21) is substantially void of the absorbent material of said central portion and said hydrophobic material of said lateral portions.

6. Absorbent product according to any one of claims 2 to 5, **characterized in that** the joining area (21) of said top sheet (9; 109; 209) and said back sheet (8; 108; 208) comprises only said top sheet and said back sheet material.

7. Absorbent product according to any one of claims 2 to 6, **characterized in that** said joining area (21) is a continuous area of the back sheet (8; 108) and said top sheet (9; 109) positioned between said lateral portions (13, 14; 113, 114).

8. Absorbent product according to any one of claims 2 to 7, **characterized in that** said joining area is formed as two joining portions (229, 230) each lying on a respective side of said central absorbent portion (202), and in that the material of each of said lateral portions (215, 216) and said central absorbent portion (206) are enclosed between the top sheet (209) and the back sheet (208).

9. Absorbent product according to claim 8, **characterized in that** each of said joining portions (229, 230) is formed as a longitudinally folded portion, and in that the longitudinal outer end regions of each folded portion are sealed (225-228) against opening at said end regions.

10. Absorbent product according to claim 9, **characterized in that** each of said longitudinally folded portions is formed as a longitudinal pleat in the back sheet and top sheet.

11. Absorbent product according to any one of the preceding claims, **characterized in that** friction-increasing means (22; 122; 222) are provided on said back sheet (8; 108; 208), said friction-increasing means being arranged to increase frictional contact forces between said backsheet and a wearer´s undergarment.

12. Absorbent product according to claim 11, **characterized in that** said friction-increasing means is a pressure-sensitive adhesive.

13. Absorbent product according to claim 11 or 12, **characterized in that** said friction-increasing means is provided on said fluid-impermeable back sheet at a location on said back sheet beneath said central absorbent portion (2; 102, 202), so as to allow said central absorbent portion to be positionally fixed with respect to a user's

undergarment whilst allowing said lateral portions to move at least laterally with respect to said central absorbent portion.

14. Absorbent product according to any one of the preceding claims, **characterized in that** the material (15, 16; 115, 116; 215, 216) comprised in said lateral portions (13, 14; 113, 114; 213, 214) is less than 50% of the thickness of the absorbent material 6; 106; 206) of said central absorbent portion (2; 102; 202).

15. Absorbent product according to any one of the preceding claims, **characterized in that** the material (15, 16; 115, 116; 215, 216) comprised in said lateral portions (13, 14; 113, 114; 213, 214)is between 5% and 20% of the thickness of the absorbent material (6; 106; 206) of said central absorbent portion (2; 102; 202).

16. Absorbent product according to any one of the preceding claims, **characterized in that** the material (15, 16; 115, 116; 215, 216) comprised in each of said lateral portions (13, 14; 113, 114; 213, 214) has a half hour-glass shape with a generally straight inner edge (17, 18; 117, 118; 217, 218) and a curved outer edge (19, 20; 119, 120; 219, 220), said curved outer edge of each of said half hour-glass shapes lying laterally outwardly and the straight inner edge thereof lying inwardly, such that the straight edges of each of said lateral portions face one another.

17. Absorbent product according to any one of the preceding claims, **characterized in that** each of said lateral portions is provided with generally longitudinally arranged elastication means (123, 124), said elastication means being positioned so as to allow longitudinal extension, and said elastication means being located proximate the

longitudinally-central part of the outer edge (19, 20; 119, 120; 219, 220) of each lateral portion.

18. Absorbent product according to any one of the preceding claims, **characterized in that** said central absorbent portion (2; 102) contains absorbent material (6; 106) which is surrounded on all sides by a fluid-permeable, preferably non-woven, sheet (7; 107).

19. Absorbent product according to any preceding claim, **characterized in that** the material of the joining area (21) provided for connecting each of said lateral portions to said central portion has a length in the lateral direction such that when said joining area material is in an extended state, the longitudinal inner edge (117, 118; 217, 218)) of each lateral absorbent portion (113, 114; 217, 218)lies laterally outside the outer longitudinal edges (104, 105; 204, 205) of said central absorbent portion (102; 202).

20. Absorbent product according to any one of the preceding claims, **characterized in that** the longitudinal edges (4, 5; 104, 105) of the central absorbent portion (2; 102) and a part of the lower surface of the central absorbent portion, which part extends laterally inwardly from each of said longitudinal edges of the central absorbent portion up to an attachment location (12; 112) with the material of the joining area (21), present a surface for direct absorption of fluids into the central absorbent portion, such that said central absorption portion can absorb fluid not only from above, but also from below and at the sides thereof.

21. Absorbent product according to any one of the preceding claims, **characterized in that** in a flattened state of said product, said two lateral portions (13, 14) at least partially underlie the lower surface of said central portion (102).

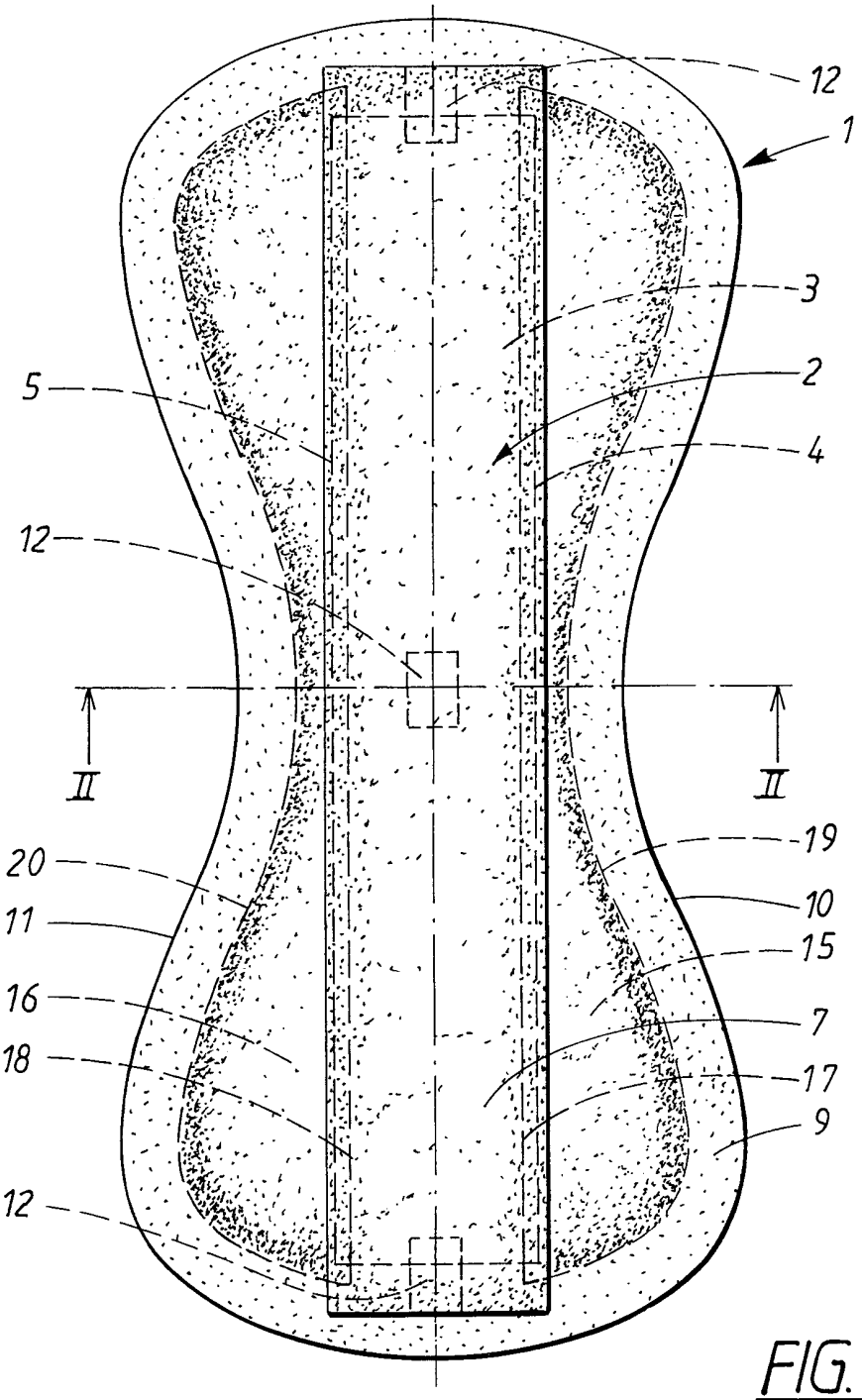
12
1
3
5
2
4
12
II
II
19
20
10
11
15
16
7
18
17
9
12

FIG. 1

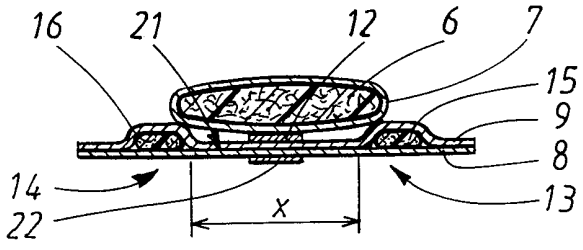
16
21
12
6
7
15
9
8
14
22
x
13

FIG. 2

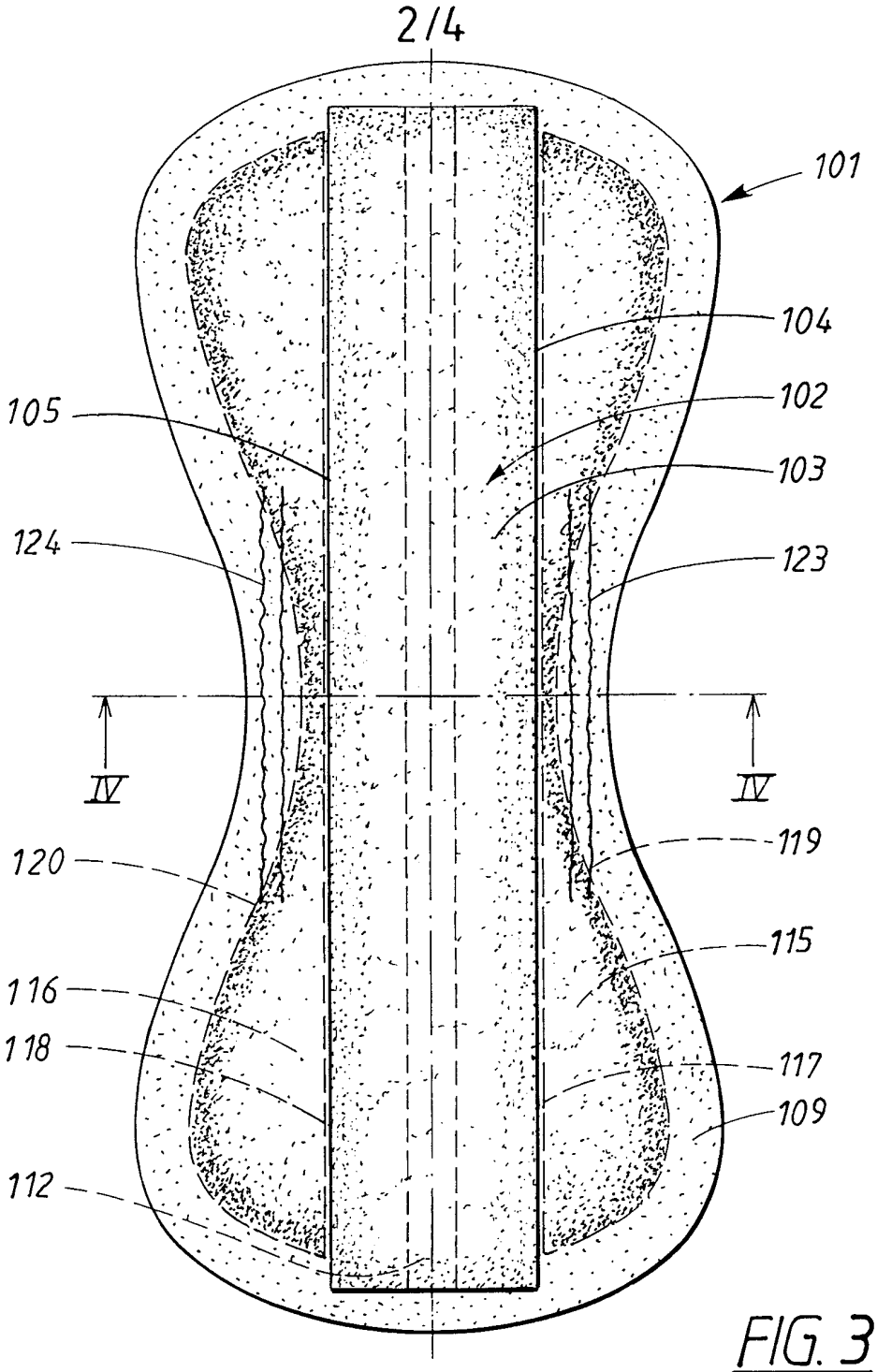
214
101
104
102
105
103
124
123
IV
IV
119
120
115
116
118
117
109
112

FIG. 3

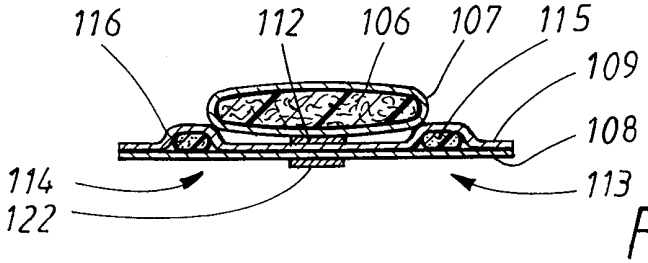
116
112
106
107
115
109
108
114
122
113

FIG. 4

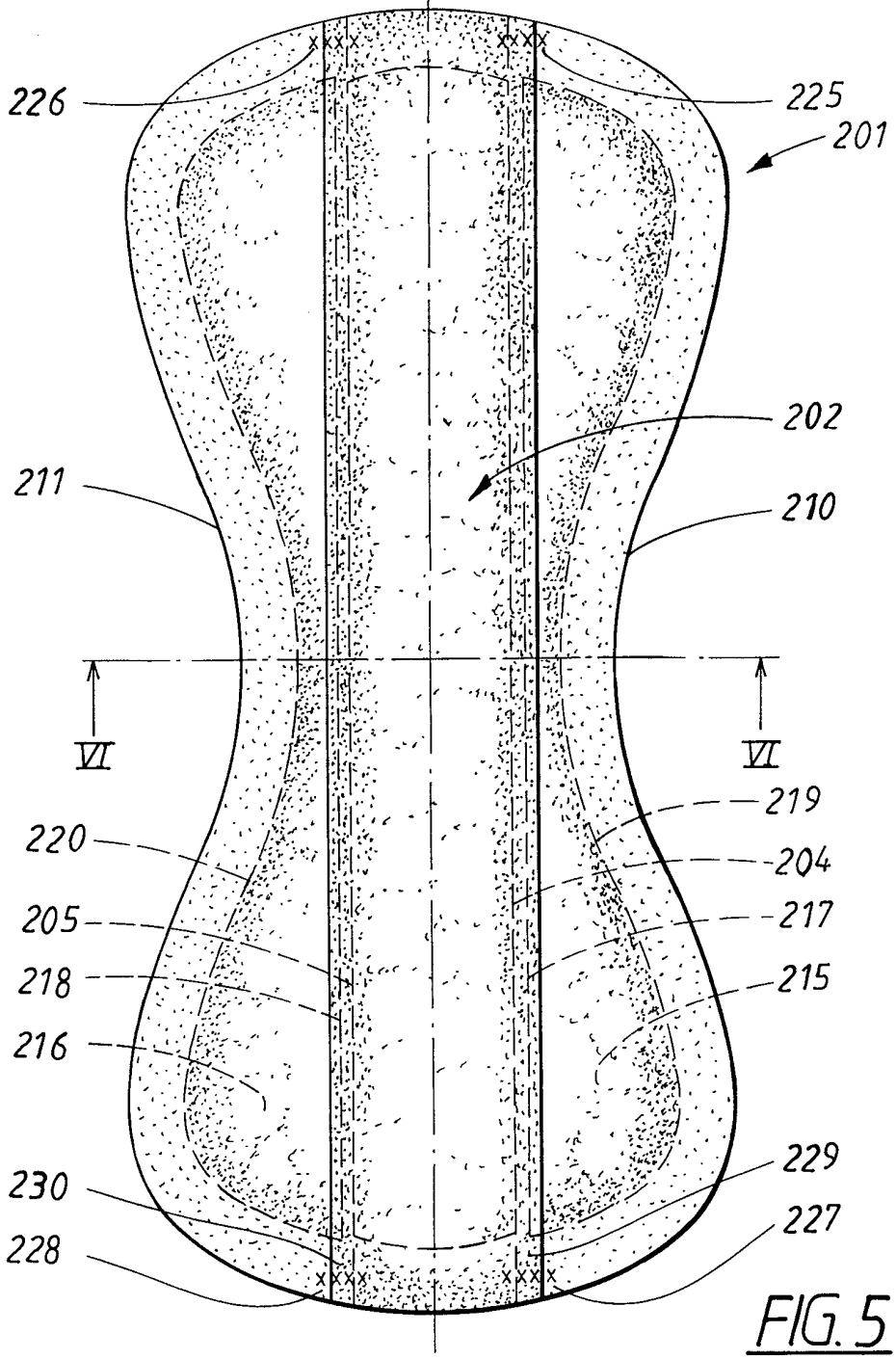
226
225
201
202
211
210
VI
VI
219
220
204
205
217
218
215
216
229
230
227
228

FIG. 5

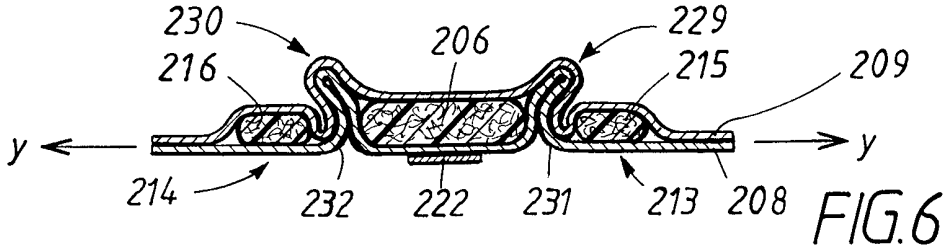
230
229
206
216
215
209
y
y
214
232
222
231
213
208

FIG. 6

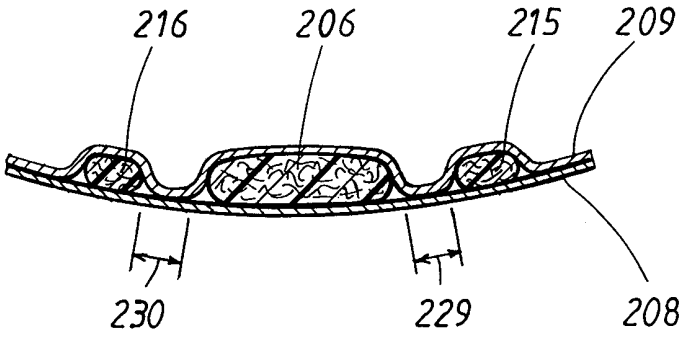

FIG. 7

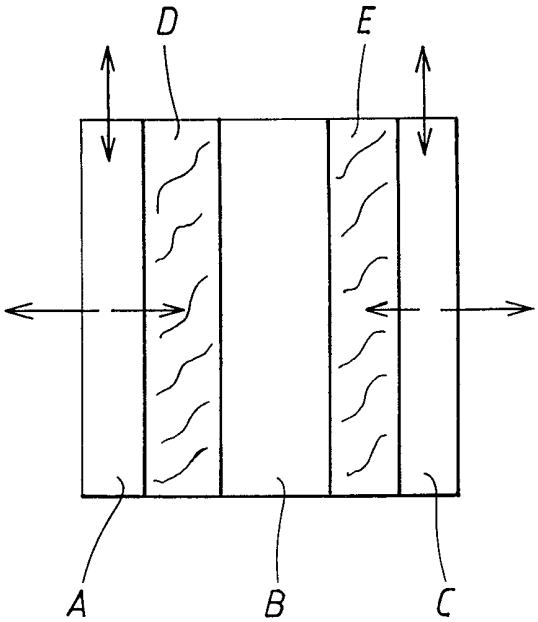

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/01404

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61F 13/15 // A61F 13/80
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)

IPC7: A61F

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

SE,DK,FI,NO classes as above

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

EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	US 5733274 A (OSBORN, III), 31 March 1998 (31.03.98), figure 4, abstract --	1-21
A	US 5197959 A (BUELL), 30 March 1993 (30.03.93), figure 13, abstract --	1-21
A	US 5507735 A (THOMAS P. VAN ITEN ET AL), 16 April 1996 (16.04.96), figures 2,6, abstract --	1-21

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 January 2000	07 -02- 2000
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Tomas Gustafsson/mj Telephone No. +46 8 782 25 00

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02/12/99

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