



(51) International Patent Classification:

A61F 13/15 (2006.01) A61F 13/511 (2006.01)
A61F 13/472 (2006.01) A61F 13/513 (2006.01)

(21) International Application Number:

PCT/EP2023/085384

(22) International Filing Date:

12 December 2023 (12.12.2023)

(25) Filing Language:

English

(26) Publication Language:

English

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

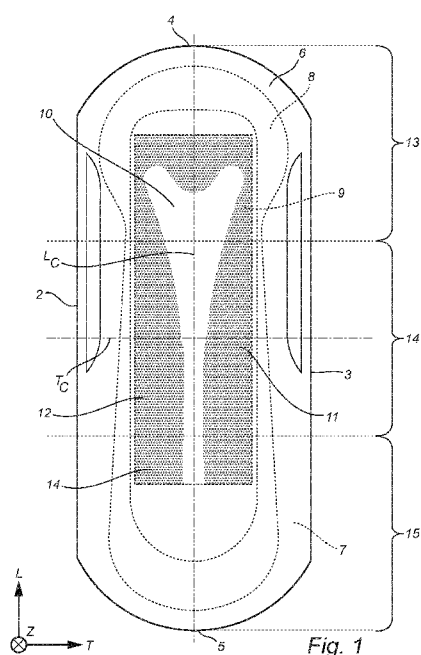
Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

— with international search report (Art. 21(3))

(54) Title: URINE INCONTINENCE PAD WITH A LIQUID INLET ZONE



(57) Abstract: The present disclosure relates to a urine incontinence pad (1) having a first and a second longitudinal side edge (2,3) and a front and a rear end edge (4,5), and a longitudinal direction (L) with a longitudinal centerline Lc, a transverse direction (T) with a transverse centerline Tc and a thickness direction (Z). The incontinence pad (1) in the longitudinal direction being divided in a front portion (13), a rear portion (15), and an intermediate portion (14) having equal length. The urine incontinence pad (1) comprising a fluid permeable fibrous topsheet (6), a backsheet (7), and an absorbent core (8) being located between the topsheet (6) and the backsheet (7) and a fluid acquisition layer (9) being located between the topsheet (6) and the absorbent core (8) comprising a fibrous layer with a basis weight within the range of from 30 to 150 gsm comprising thermoplastic material. The incontinence pad (1) has a liquid inlet zone (10) extending along the longitudinal centerline Lc in the front (13) and the intermediate portion (14). A boundary zone (11) is at least partly surrounding the liquid inlet zone (10) and comprising a first bonding pattern (12), such as a thermobonded or ultrasonic bonded pattern, in the form of a discrete pattern elements (14) bonding together the topsheet (6) and the fluid acquisition layer (9). The area of the inlet boundary zone (11) in relation to the area of the inlet zone (10) in the intermediate portion (14) is more than 50%.

URINE INCONTINENCE PAD WITH A LIQUID INLET ZONE

TECHNICAL FIELD

The present disclosure relates to a urine incontinence pad having a first and a second longitudinal side edge and a front and a rear end edge, and a longitudinal direction L with a longitudinal centerline Lc, a transverse direction T with a transverse centerline Tc and a thickness direction Z. The incontinence pad is in the longitudinal direction divided in a front portion, a rear portion, and an intermediate portion having equal length. The urine incontinence pad comprising a fluid permeable fibrous topsheet, a backsheet, and an absorbent core being located between the topsheet and the backsheet and a fluid acquisition layer being located between the topsheet and the absorbent core. The fluid acquisition layer is comprising a fibrous layer with a basis weight within the range of from 30 to 150 gsm and comprising thermoplastic material. The term "urinary incontinence pad" refers to a product that is placed against the skin of the wearer in the wearer's crotch to absorb and contain body exudates, like urine, faeces and menstrual fluid. The disclosure may be a disposable urinary incontinence pad, which means a pad not intended to be laundered or otherwise restored or reused as an incontinence pad.

BACKGROUND OF THE INVENTION

Urine incontinence pads to which this disclosure relates are typically intended to absorb body liquids, such as urine. Such articles may be absorbent pads for heavier bladder leakage or thinner absorbent pads or liners for light bladder leakage. Incontinence pads are generally provided with an absorbent core to receive and retain body liquids. For incontinence pads intended for bladder leakage to function efficiently, the absorbent core must quickly acquire body liquids into the structure from the point of application and subsequently distribute the body liquids within and throughout the absorbent core.

Users of incontinence pads, sometimes experience skin problems. Skin problems can be caused by forces arising from physical/mechanical interaction between the product and the user's skin. Thus, for example chafing is caused due to extra friction between the absorbent hygiene product and the skin of the user. During the user's movements, e.g. during walking, running or other exercise, there is a risk for undesirable mechanical friction, especially between the pad and the user around the tendons in the groin area, which may also lead to occlusion and an increased mechanical impact on the skin with an increased risk for skin irritations. This type of incontinence pads are often used frequently, sometimes daily, and

this may also lead to an increased risk of skin irritation. In view of the above, there is a need for a urine incontinence pad which has a rapid intake of urine liquid, good fit, is discreet to wear and has decreased risk of skin irritation due to e.g. friction between the article and the user, especially around the tendons in the groin area.

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SUMMARY

The present disclosure provides a urine incontinence pad with good leakage security, fit and decreased risk of skin irritation. One or more of the above objects is achieved with a urine incontinence pad according to claim 1. Further advantages and advantageous features of the invention are disclosed in the following description and in the dependent claims.

The present disclosure relates to a urine incontinence pad having a first and a second longitudinal side edge and a front and a rear end edge, and a longitudinal direction, L, with a longitudinal centerline Lc, a transverse direction, T, with a transverse centerline Tc and a thickness direction Z. The incontinence pad, in the longitudinal direction, being divided in a front portion, a rear portion, and an intermediate portion having equal length. The urine incontinence pad comprising a fluid permeable fibrous topsheet, a backsheet, an absorbent core being located between the topsheet and the backsheet, and a fluid acquisition layer being located between the topsheet and the absorbent core comprising a fibrous layer with a basis weight within the range of from 30 to 150 gsm comprising thermoplastic material. The incontinence pad has a liquid inlet zone extending along the longitudinal centerline Lc in the front and intermediate portion. The incontinence pad has also a boundary zone, at least partly surrounding the liquid inlet zone and comprising a first bonding pattern, such as a thermobonded and/or ultrasonic bonded pattern, in the form of discrete pattern elements bonding together the topsheet and the fluid acquisition layer. The area of the boundary zone in relation to the area of the inlet zone in the intermediate portion is more than 50%.

The area of the inlet zone may be greater in the front portion than in the intermediate portion.

The "inlet zone" is a "liquid inlet zone" and the "boundary zone" is surrounding the "inlet zone".

The area of the boundary zone is defined as the circumference around the thermobonded and/or ultrasonic bonded pattern. If the boundary zone contains more than one boundary area, the total area of the boundary zone is the sum of the different boundary areas.

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The liquid acquisition layer between the topsheet and the absorbent core should have the ability to receive large quantities of liquid over a short period, spread the liquid in the plane of the material layer, convey the liquid onward to an absorbent core which is arranged under the acquisition layer, and, in addition, also be able temporarily to store liquid which the
5 absorptive core has not had time to absorb. This is of importance, especially in the case of today's thin, compressed absorptive bodies, which may have a high content of superabsorbent material. A porous, relatively thick liquid acquisition layer, in the form of an open and lofty nonwoven with a basis weight within the range of from 30 to 150 gsm receives liquid rapidly and can also temporarily store the liquid until the absorptive core has had time
10 to absorb it. The fluid acquisition layer may have a basis weight within the range of from 45 to 130 gsm, or 60 to 120 gsm.

The incontinence pad has an inlet zone extending along the longitudinal centerline Lc at least in the front and intermediate portion. A boundary zone is delimiting the inlet zone and is
15 surrounding the liquid inlet zone and comprising a first bonding pattern, such as a thermobonded or ultrasonic bonded pattern, in the form of a discrete repeating pattern elements bonding together the topsheet and the fluid acquisition layer. In the boundary zone, the fluid permeable fibrous topsheet and the acquisition layer are mutually connected by bond sites within which the thermoplastic material has been caused to at least partially soften
20 or melt and thereby bond the two material layers together. An advantage with a boundary zone comprising a bonding pattern, such as a thermobonded or ultrasonic bonded pattern, in the form of a discrete pattern elements bonding together the topsheet and the fluid acquisition layer, is that the boundary zone exhibits a drier surface than the inlet zone, which is an advantage since it decreases the risk of skin irritation.

25

Friction occurring between a nonwoven material and the skin of the user is different in the presence of liquid/moisture than when no liquid/moisture is present. Even a very small amount of moisture has a negative impact on the friction forces occurred between the material and the skin of the user. It has been discovered that the area of the boundary
30 zone has a drier surface than the area of the inlet zone, see below in more detail in Example 1. It has therefore been discovered that it is important to carefully design the incontinence pad, to optimize the dryness in the area of the incontinence pad which during use is located around the tendons in the groin area, and which correlates with the intermediate portion of the incontinence pad. Therefore, the area of the boundary zone in relation to the area of the
35 inlet zone in the intermediate portion, is more than 50%. Thereby, the dryness is increased,

and the friction is decreased, especially around the tendons in the groin area which is a narrow area with high level of mechanical interaction between the article and the user.

The area of the boundary zone may be greater in the intermediate portion than in the front
5 portion.

At least the majority of the discrete pattern elements of the first bonding pattern may be spaced between each other by a distance smaller than 3 mm, or smaller than 2 mm, or smaller than 1.5 mm. In this context, the distances between the discrete pattern elements,
10 the bonding sites, are determined as being the shortest distance between the bonding sites which are lying adjacent to each other in a corresponding manner. The distances are measured from the edges of the bonding sites. The percentage bonded area in the boundary zone in relation to the total area in the boundary zone may be greater than 10 %, or 15% or 20%.

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The topsheet and the fluid acquisition material are in the boundary zone connected to each other by a large number of bonding sites. The bonding sites are virtually punctate and have been formed by simultaneously compressing the material laminate and supplying energy to it. This has caused the thermoplastic material to soften or melt at the bonding sites and
20 thereby bond together the topsheet and the fluid acquisition material. The bonding together of the topsheet and the fluid acquisition material is performed by means of heat bonding or by means of ultrasound bonding. When the melted or softened thermoplastic material in the fluid inlet material cools, it solidifies and serves as a bonding agent for the material laminate composed of the topsheet and the acquisition layer. In addition to bonding together the
25 topsheet and the fluid acquisition material, a permanent compaction or condensation of the porous structure in the topsheet and the acquisition layer in the boundary zone is obtained.

The dense location of the bonding sites results in a boundary zone exhibiting a higher degree of compaction than the inlet zone. The material within and immediately around the bonding
30 sites is strongly compacted, with finer capillaries than the surrounding material. This results in the bonding sites constituting areas which have an increased ability to allow liquid from the inlet zone to pass into the boundary zone. Even if the actual bonding sites are almost completely liquid-impermeable, the compacted fiber structure which has arisen around the bonding sites due to the compression which takes place in connection with the bonding,
35 results in areas immediately around each bonding site which exhibits a high ability to transfer liquid. Due to the fact that the distance between the bonding sites is relatively small, the area

around the bonding sites is also affected such that a denser structure is obtained. Thus, the capillary size in the compacted areas in the boundary zone are smaller than the capillary size in the area of the inlet zone. Therefore, it is a benefit to have a dense pattern of a plurality of discrete bonding sites in the boundary zone.

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Each discrete pattern element may have a diameter less than 3mm, or less than 2 mm, or less than 1.5 mm.

Suitable thermoplastic fibers in the fluid acquisition layer may be polyolefins such as
10 polyethylene (PE), polypropylene (PP), polyester (PET) and/or copolyester (coPET). Different types of so-called bicomponent fibres can also be used. The amount of polyester (PET) fibers may be 20 to 50 weight% and the amount of copolyester (coPET) fibers may be 20 to 50 weight%. The acquisition layer may comprise bicomponent fibers, for example bicomponentfibers of polypropylene (PP) and polyester (PET).

15

The liquid acquisition layer may comprise fibers having 2-14 dtex, or optionally 6-12 dtex. The liquid acquisition layer may comprise coarser fibers than the fluid permeable fibrous topsheet.

20 The liquid permeable layer may also comprise a nonwoven material comprising thermoplastic materials, such as for example polypropylene and/or polyethylene.

The total area of the boundary zone may be greater than the total area of the inlet zone.

25 The boundary zone may have the same extension in the longitudinal direction as the fluid acquisition layer.

The area of the inlet zone in relation to the area of the boundary zone in the front portion may be greater than 50%. The inlet zone may have a maximum transverse width in the front
30 portion and may taper to a minimum transverse width in the intermediate portion or the rear portion.

Since the bonding pattern in the boundary zone compresses the area in the boundary zone, also cushion like area in the inlet zone is formed. A benefit with forming a cushion like area in
35 the inlet zone is that the inlet zone is visible for the user from the topsheet. The appearance

with a cushion like area in the inlet zone would also be signaling softness. The thickness of the urine incontinence pad may be greater in the inlet zone than in the boundary zone.

The liquid acquisition layer may be located at least in part of the front portion and the
5 intermediate portion. The liquid acquisition layer may be smaller than the absorbent core so that it does not extend in the transverse direction over the full width of the absorbent core, and/or does not extend in the longitudinal direction over the full length of the absorbent core. This provides the urine incontinence pad with a discreet front and rear part, while allowing rapid inlet in the inlet zone. The fluid acquisition layer may extend no further than over 85%
10 of the absorbent core. The length of the acquisition layer may be within the range of from 40% to 85% of a length of the absorbent core. This provides a secure inlet zone over the area where the liquid absorption properties are needed the most, and discrete zones with thinner areas at the front and in the rear parts of the pad. The liquid acquisition layer may have a generally rectangular shape.

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According to an alternative embodiment, the fluid acquisition layer and the absorbent core have equal size. By having equal size, for example the manufacturing process can be simplified. If the liquid acquisition layer is also extending to the rear portion, the inlet- and the boundary zone may also be extending to the rear portion. The inlet area in the rear portion
20 may also be less than the boundary area in the rear portion.

The fluid permeable fibrous topsheet and the acquisition layer may also be bonded together at one or a few bonding sites also in the inlet zone. According to this embodiment, the percentage bonded area in relation to the total area in the inlet zone is very low, and only
25 bonded together at a few bonding sites i.e. 1-10 bonding sites. An advantage by having one or a few bonding sites also in the inlet zone may be that the inlet zone will be more visually appealing due to visualising a bulky, soft and pillow-like appearance of the inlet zone. The thickness of the urine incontinence pad may be greater in the inlet zone than in inlet boundary zone. The boundary zone may be printed to enhance its visual appearance.

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The absorbent core may have a higher density than the fluid acquisition layer. Such density gradient promotes rapid liquid drainage from the fluid acquisition layer to the absorbent core. The task of the fluid acquisition layer is to take up and temporarily store fluid that impacts on the pad at a high flow rate, in order thereafter to be drained by the absorption core at a
35 slower rate. The absorbent core may comprise only one single absorbent layer, or two or more absorbent layers. If the absorbent core comprises two layers, the first core layer and

the second core layer may have different sizes, so as to provide a urine incontinence pad with for example a thinner discreet front and rear part. According to one embodiment does the absorbent core comprising two core layers, a first core layer located between the topsheet and a second core layer, and a second core layer between the first core layer and the liquid impervious backsheet. The first and/or the second core layer may comprise superabsorbent polymers, for example in an amount of from 40 wt.%, such as from 50%, optionally within the range of from 40% to 70%. The superabsorbent polymer may for example be mixed with cellulose fibers. The second core layer may have a higher density than the first core layer, optionally at least 50% higher density than the first core layer, such at least 75% higher density than the first core layer, or at least 100% higher density than the first core layer. Such density gradient promotes rapid liquid drainage from the first core layer to the second core layer and thus also a rapid inlet from the topsheet, providing higher surface dryness and reduced risk of rewet.

15 The boundary zone may be surrounding the entire circumference of the inlet zone, and be a continuous area that is surrounding the entire inlet zone.

The boundary zone may alternatively comprise at least two separate discontinuous areas that together surround the majority of the circumference of the inlet zone. So, the boundary zone may comprise at least two separate discontinuous areas that together surround at least the majority of the circumference of the inlet zone, for example surrounding at least 75% of the circumference of the inlet zone, or at least 80% of the circumference of the inlet zone, or at least 90% of the circumference of the inlet zone, or at least 95% of the circumference of the inlet zone. According to this embodiment, is the boundary zone divided into a first- and second side boundary area, each side boundary area extending on respective side of the longitudinal centerline Lc. The first- and second side boundary area may be provided frontwards and rearwards of the inlet zone. Optionally the boundary zone has also a third and/or fourth boundary area. The third boundary area may be extending over the longitudinal centerline Lc and having its front end edge closer towards the front end edge of the urine incontinence pad, than the front end edge of the first and second boundary areas. The fourth boundary area may be extending over the longitudinal centerline Lc and having its rear end edge closer towards the rear end edge of the urine incontinence pad, than the rear end edge of the first and second boundary areas. The percentage bonded area in relation to the total area may differ in respective boundary areas, for example may the bonded area in the first and second side boundary areas be greater than the percentage bonded area in a third and/or fourth boundary areas.

The inlet zone may have a maximum transverse width in the front portion and may taper to a minimum transverse width in the intermediate portion or the rear portion. The inlet zone may be mirror-symmetric about the longitudinal centerline Lc.

- 5 According to one embodiment does the inlet zone have a maximum transverse width in the front portion and taper to a minimum transverse width in the intermediate portion or the rear portion and be mirror-symmetric about the longitudinal centerline Lc.

- 10 The first and second longitudinal edges of the urine incontinence pad may be essentially straight and essentially parallel to each other. Alternatively, the urine incontinence pad may be wider in at least a part of the front portion than in the intermediate and rear portion.

BRIEF DESCRIPTION OF THE DRAWINGS

- 15 The present invention will be further explained hereinafter by means of non-limiting examples and with reference to the appended drawings wherein:

Fig. 1 shows a urine incontinence pad according to the present disclosure; and

- 20 Fig. 2 is an exploded view of the urine incontinence pad from Fig. 1.

Fig 3 shows two urine incontinence pads with alternative inlet- and boundary zones

DETAILED DESCRIPTION

- 25 It is to be understood that the figures are schematic and that individual components are not necessarily drawn to scale. The urine incontinence pad shown in the figures are provided as examples only and should not be considered limiting to the invention. The urine incontinence pad disclosed herein can be varied within the scope of the appended claims.

- 30 Fig 1 shows a urine incontinence pad 1, as seen from the wearer-facing side. The urine incontinence pad 1 has a longitudinal direction L with a longitudinal centerline Lc, a transverse direction T with a transverse centerline Tc and a thickness direction Z. The urine incontinence pad 1 has a first and a second longitudinal side edge 2,3 and a front and a rear end edge 4,5. The incontinence pad 1 is in the longitudinal direction divided in a front portion 13, a rear portion 15, and an intermediate portion 14 having equal length. The urine
35 incontinence pad 1 comprising a fluid permeable fibrous topsheet 6, a backsheet 7, and an

absorbent core 8 being located between the topsheet 6 and the backsheet 7. A fluid acquisition layer 9 is located between the topsheet 6 and the absorbent core 8. The fluid acquisition layer 9 is a fibrous layer with a basis weight within the range of from 30 to 150 gsm comprising thermoplastic material. Furthermore, incontinence pad 1 has a liquid inlet zone 10 extending along the longitudinal centerline Lc in the front portion 13, intermediate portion 14 and also in a part of the rear portion 15. The area of the inlet zone 10 shall be greater in the front portion 13 than in the intermediate portion 14. The boundary zone 11 is surrounding the liquid inlet zone 10 and comprising a first bonding pattern 12, such as a thermobonded or ultrasonic bonded pattern, in the form of a discrete pattern elements 14 bonding together the topsheet 6 and the fluid acquisition layer 9. The area of the boundary zone 11 in relation to the area of the inlet zone 10 in the intermediate portion 14 is more than 50%. The area of the boundary zone 11 is greater in the intermediate portion 14 than in the front portion 13. The discrete pattern elements 14 of the first bonding pattern 12 are spaced between each other by a distance smaller than 2 mm. The inlet zone 10 has a maximum transverse width in the front portion 13 and tapers to a minimum transverse width in the intermediate portion 14 or the rear portion 15. The inlet zone is mirror-symmetric about the longitudinal centerline Lc.

Fig 2 is an exploded view of the urine incontinence pad from Fig 1. Fig 2 shows the urine incontinence pad 1 comprising a fluid permeable fibrous topsheet 6, a backsheet 7, and an absorbent core 8 being located between the topsheet 6 and the backsheet 7. A fluid acquisition layer 9 is located between the topsheet 6 and the absorbent core 8. The incontinence pad 1 has a liquid inlet zone 10 extending along the longitudinal centerline Lc in the front portion 13, the intermediate portion 14 and also in a part of the rear portion 15. The area of the inlet zone 10 is greater in the front portion 13 than in the intermediate portion 14. The boundary zone 11 is surrounding the liquid inlet zone 10 and comprising a first bonding pattern 12, such as a thermobonded or ultrasonic bonded pattern, in the form of a discrete pattern elements 14 bonding together the topsheet 6 and the fluid acquisition layer 9. The area of the boundary zone 11 in relation to the area of the inlet zone 10 in the intermediate portion 14 is more than 50% and the area of the boundary zone 11 is greater in the intermediate portion 14 than in the front portion 13. The inlet zone 10 has a maximum transverse width in the front portion 13 and tapers to a minimum transverse width in the intermediate portion 14 or the rear portion 15. The inlet zone is mirror-symmetric about the longitudinal centerline Lc. The incontinence pad also comprising an absorbent core 8. The absorbent core 8 in the incontinence pad 1 comprising one layer of absorbent material. However, the incontinence pad 1 according to the invention may also comprise more than one absorbent core layer. The absorbent core 8 may be of any conventional kind. Examples

of commonly occurring absorbent materials are cellulosic fluff pulp, tissue, highly absorbent polymers (so called superabsorbents), absorbent foam materials, absorbent nonwoven materials or the like. It is common to combine cellulosic fluff pulp with superabsorbent polymers in an absorbent core. A high absorption capacity is provided by the use of high

5 amounts of superabsorbent material. Thin absorbent cores, which are common in for example urine incontinence pads, often comprise a compressed, mixed or layered structure of cellulosic fluff pulp and superabsorbent polymers. In certain embodiments, the absorbent core can be of unitary construction, whereby for example the manufacturing process can be simplified. The phrase "unitary construction" in the present context is intended to mean that
10 the absorbent core is constructed from the same type of material, or the same combination of two or more materials throughout the absorbent core. Variations in for example density and concentration of the material may occur, but these are limited to those which may be obtained without incorporation of regions which have been formed separately and then physically joined to each other.

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In certain embodiments, the absorbent core can have a multi layered structure. In this sense, the absorbent core can comprise a plurality of absorbent layers. When the absorbent core comprises a plurality of absorbent layers, the layers may be equally sized or may differ in one or more dimensions.

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Fig 3 shows two alternative incontinence pads, as seen from the wearer-facing side. In one alternative incontinence pad, the boundary zone is surrounding the entire circumference of the inlet zone, and the boundary zone is a continuous area that completely surrounds the entire inlet zone. The inlet zone in this alternative incontinence pad, has an oval shape. In
25 the other alternative incontinence pad in Fig 3, the boundary zone comprising two separate discontinuous areas that together are surrounding the majority of the circumference of the inlet zone. So, the boundary zone in this alternative incontinence pad has two separate discontinuous areas that together surround at least the majority of the circumference of the inlet zone. In this alternative incontinence pad, the boundary zone is divided into a first- and
30 second side boundary area, each side boundary area extending on respective side of the longitudinal centerline Lc. In this alternative incontinence pad, has the inlet zone a maximum transverse width in the front portion and tapers to a minimum transverse width in the intermediate portion and the rear portion. The inlet zone is mirror-symmetric about the longitudinal centerline Lc. Also, the first- and second side boundary areas are mirror-
35 symmetric about the longitudinal centerline Lc.

Example 1 – Surface wetness measurement

After dosing a volume of liquid to a sample the remaining volume of liquid was measured across a depth of 500 μm starting from a wearer facing topsheet side and extending towards
5 the backsheets. The equipment used was NMR-MOUSE model PM25 (Mobile Universal Surface Explorer) from Magritek GmbH. NMR MOUSE is a device for the analysis of the wetness profile in the thickness direction (Z) of an absorbent article. The NMR sensor uses the same principles as clinical Magnetic Resonance Imaging. Water molecules are detected via radiofrequency waves. The sensor excites a sensitive volume at a fixed distance from a
10 magnet surface. By mechanically moving the sensor the sensitive volume is stepped through the sample and the pulse sequence is then applied at each position. The amplitude of the response signal is a direct measure of the amount of water in the inspected volume. In this case the inspected volume is based on an area of 4 cm x 4 cm and a thickness of 100 μm . The measurement is made across a depth of 500 μm starting from the wearer facing
15 topsheet side and extending towards the backsheets. By a distance interval of 100 μm , the amplitude is measured and from this data a volume of the total liquid acquired is then calculated in μl .

Sample 1 was the inlet zone of a urine incontinence pad according to the invention. The
20 topsheet layer was a nonwoven fiber layer of 100% polypropylene fibers. The liquid acquisition layer was a nonwoven layer with 40 weight % of PP/PET- bicomponent fibers, 30 weight-% CoPET fibers and 30 weight % PET-fibers. The fluid permeable topsheet layer and the fluid acquisition layer were laminated by glue. The absorbent core comprising cellulose pulp and superabsorbent particles.

25

Sample 2 was the boundary zone of a urine incontinence pad according to the invention and comprising the same material layers as the urine incontinence pad in Sample 1. The boundary zone has an ultrasonic bonded pattern in the form of a discrete pattern elements.

30 A dosing unit was used to add 10 ml of test solution to the sample, and then the sample was drained from excess test solution for 1 min. The test solution was 0.9% saline solution. The sample was conditioned at 23° C and 50 % relative humidity for two hours prior to testing and the measurement was conducted in a room controlled at 23° C and 50% relative humidity.

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Samples	Liquid Volume (μl)
Sample 1 (inlet zone)	19.8
Sample 2 (boundary zone)	5.9

The result shows that sample 2, the boundary zone, is drier than sample 1, the inlet zone, without the ultrasonic bonded pattern.

CLAIMS

1. A urine incontinence pad (1) having a first and a second longitudinal side edge (2,3) and a front and a rear end edge (4,5), and a longitudinal direction (L) with a longitudinal centerline (Lc), a transverse direction (T) with a transverse centerline (Tc) and a thickness direction (Z), the incontinence pad (1) in the longitudinal direction being divided in a front portion (13), a rear portion (15), and an intermediate portion (14) having equal length, the urine incontinence pad (1) comprising a fluid permeable fibrous topsheet (6), a backsheet (7), and an absorbent core (8) being located between the topsheet (6) and the backsheet (7) and a fluid acquisition layer (9) being located between the topsheet (6) and the absorbent core (8) comprising a fibrous layer with a basis weight within the range of from 30 to 150 gsm comprising thermoplastic material, the incontinence pad has a liquid inlet zone (10) extending along the longitudinal centerline (Lc) in the front (13) and intermediate portion (14) **characterized in that** the incontinence pad has a boundary zone (11) at least partly surrounding the liquid inlet zone (10) and comprising a first bonding pattern (12), such as a thermobonded or ultrasonic bonded pattern, in the form of a discrete pattern elements (14) bonding together the topsheet (6) and the fluid acquisition layer (9), wherein the area of the boundary zone (11) in relation to the area of the inlet zone (10) in the intermediate portion (14) is more than 50%.
2. A urine incontinence pad according to claim 1, wherein the area of the inlet zone (10) is greater in the front portion (13) than in the intermediate portion (14).
3. A urine incontinence pad according to claim 1 or 2, wherein the fluid acquisition layer (9) comprising a fibrous layer with a basis weight within the range of from 45 to 130 gsm, or 60 to 120 gsm.
4. A urine incontinence pad according to any of preceding claims, wherein the area of the boundary zone (11) is greater in the intermediate portion (14) than in the front portion (13).
5. A urine incontinence pad (1) according to any of preceding claims, wherein at least the majority of the discrete pattern elements (14) of the first bonding pattern (12) are spaced between each other by a distance smaller than 3 mm, or smaller than 2 mm, or smaller than 1.5 mm.

6. A urine incontinence pad according to any of preceding claims, wherein the percentage bonded area in the boundary zone in relation to the total area in the boundary zone is greater than 10 %, or greater than 15% or greater than 20%.
- 5 7. A urine incontinence pad (1) according to any of preceding claims, wherein each discrete pattern elements (20) has a diameter less than 3 mm, or less than 2 mm, or less than 1.5 mm.
8. A urine incontinence pad according to any of preceding claims, wherein the acquisition
10 layer comprising polyester (PET) fibers.
9. A urine incontinence pad according any of preceding claims, wherein the acquisition layer comprising co-polyester (coPET) fibers.
- 15 10. A urine incontinence pad according to claim 8 and 9, wherein the amount of polyester (PET) fibers is 20 to 50 weight% and the amount of co-polyester (coPET) fibers is 20 to 50 weight%.
- 20 11. A urine incontinence pad according to any of preceding claims, wherein the acquisition layer comprising bicomponent fibers, optionally bicomponent fibers of polypropylene (PP) and polyester (PET).
12. A urine incontinence pad according to any of preceding claims, wherein the acquisition
25 layer comprises fibers having a coarseness of 2 to 14 dtex, or optionally 6-12 dtex.
13. A urine incontinence pad according to any of preceding claims, wherein the fluid permeable fibrous topsheet comprising a nonwoven material comprising thermoplastic fibers.
30
14. A urine incontinence pad according to any of preceding claims, wherein the acquisition layer comprises coarser fibers then the fibers in the fluid permeable fibrous topsheet.
15. A urine incontinence pad according to any of claims any of preceding claims, wherein the
35 total area of the boundary zone (11) is greater than the area of the inlet zone (10).

16. A urine incontinence pad according to any of preceding claims, wherein the boundary zone (11) has the same extension in the longitudinal direction as the fluid acquisition layer (9).

5 17. A urine incontinence pad according to any of preceding claims, wherein the area of the inlet zone (10) in relation to the area of the boundary zone (11) in the front portion (13) is greater than 50%.

10 18. A urine incontinence pad according to any of preceding claims, wherein the liquid acquisition layer (9) is located at least in part of the front portion (13) and the intermediate portion (14), and the length of the liquid acquisition layer (9) is within the range of from 40% to 85% of the length of the absorbent core (8).

15 19. A urine incontinence pad (1) according to any of claims 1-17, wherein the liquid acquisition layer (9) has the same length as the absorbent core (8).

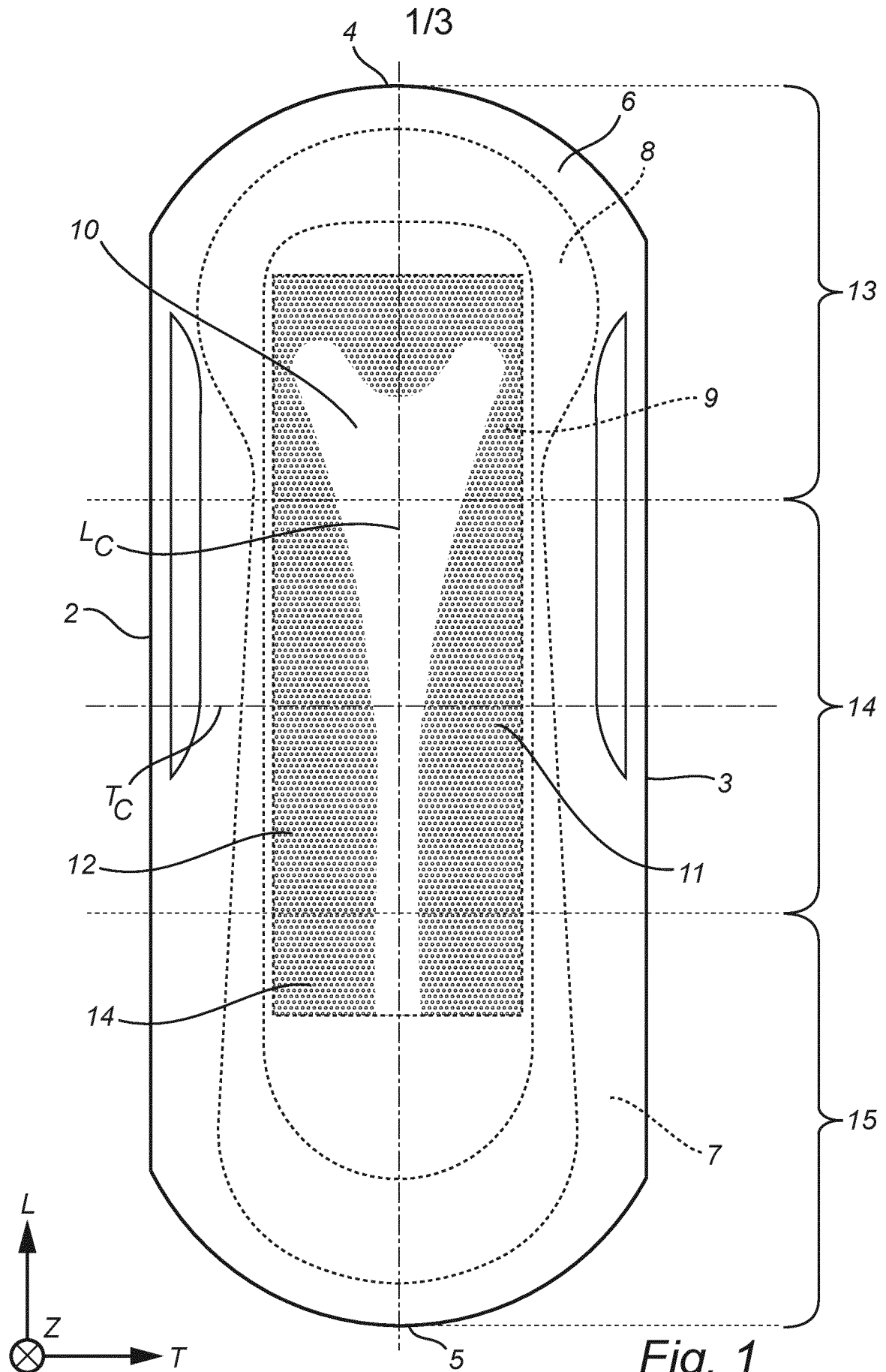
20 20. A urine incontinence pad (1) according to any of preceding claims, wherein the fluid permeable fibrous topsheet and the liquid acquisition layer is bonded together at one or a few bonding sites also in the inlet zone.

21. A urine incontinence pad (1) according to any one of the preceding claims, wherein the absorbent core (8) has a higher density than the fluid acquisition layer (9).

25 22. A urine incontinence pad (1) according to any of preceding claims, wherein the area of the boundary zone (11) is a continuous area surrounding the entire inlet zone (10).

23. A urine incontinence pad (1) according to any of claim 1 - 20, wherein the boundary zone (11) is divided into more than one area.

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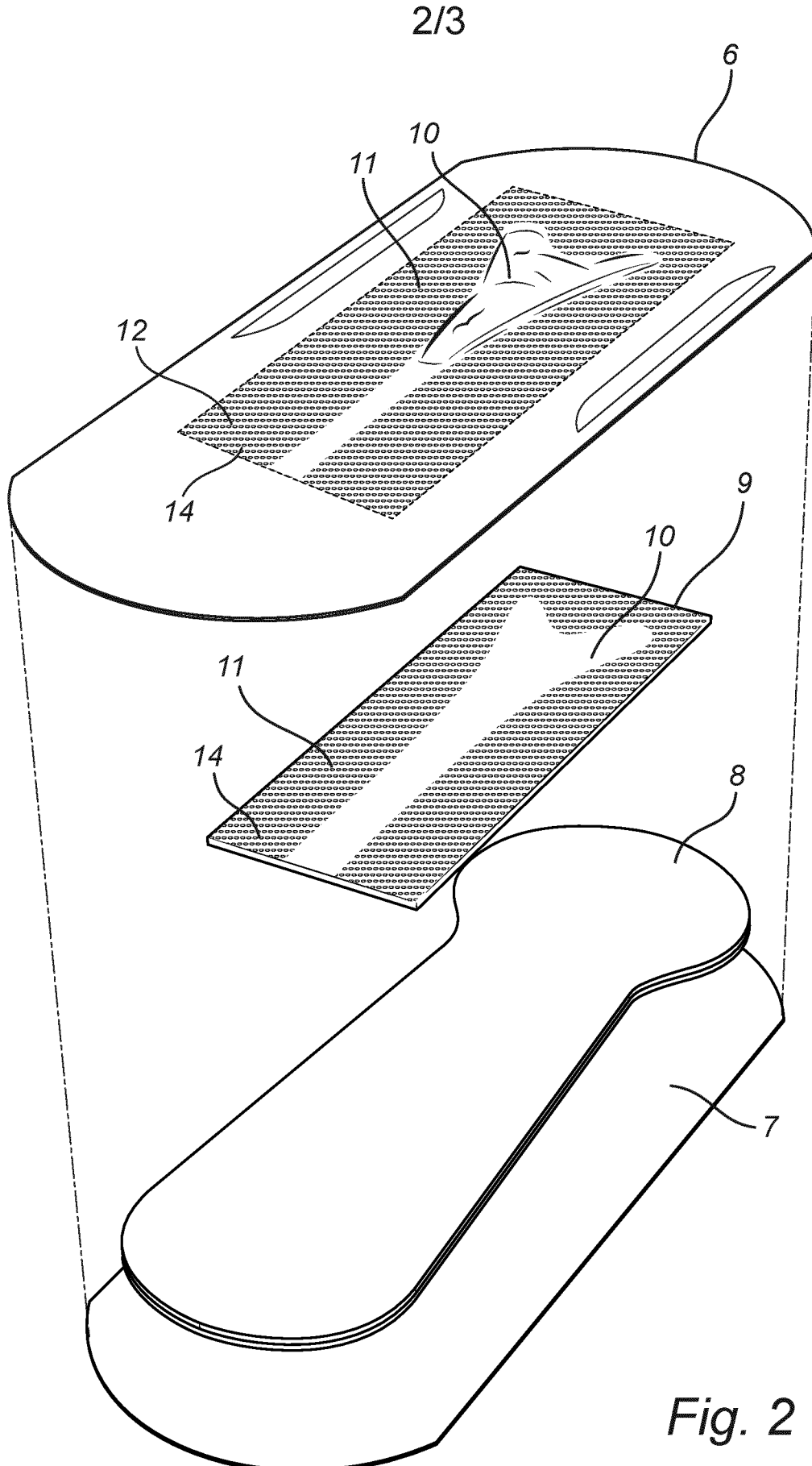


Fig. 2

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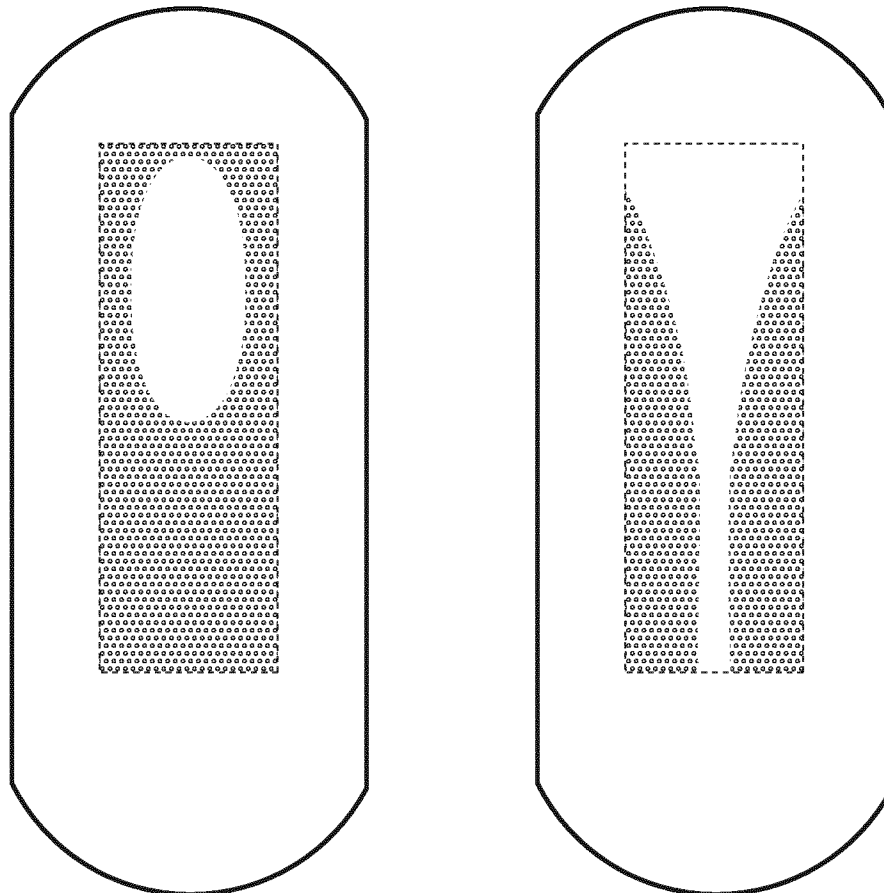


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2023/085384

A. CLASSIFICATION OF SUBJECT MATTER		
INV. A61F13/15 A61F13/472 A61F13/511 A61F13/513		
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, BIOSIS, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	EP 0 617 602 B1 (PROCTER & GAMBLE [US]) 26 March 1997 (1997-03-26) col. 15-22, item 1 col.10, item B	1 - 23
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 29 May 2024		Date of mailing of the international search report 06/06/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Hoff, Céline

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