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Inventor(s)	ELGLUND; Gunnel et al.

A DISPOSABLE ABSORBENT HYGIENE PRODUCT

Abstract

A disposable absorbent hygiene product includes a chassis having a body facing surface and a garment facing surface, a longitudinal axis from a first end portion towards a second end portion and a transversal axis, the chassis including a liquid permeable topsheet, a liquid impermeable backsheet, and an absorbent core assembly including at least one absorbent core arranged between the topsheet and the backsheet, the disposable absorbent hygiene product includes a pair of side portions extending on each side of the first end portion to fasten the absorbent hygiene product to the waist of a wearer, the disposable absorbent hygiene product includes at least one fastener arranged on at least one of the side portions and/or the second end portion of the disposable absorbent hygiene product to fasten the absorbent hygiene product to the waist of a wearer.

Inventors:	**ELGLUND; Gunnel (Göteborg, SE), SILFVERSTRAND; Anders (Mölnlycke, SE), GRIMBERG; Jeanette (Göteborg, SE)**
Applicant:	**Essity Hygiene and Health Aktiebolag** (Göteborg, SE)
Family ID:	**1000008616154**
Assignee:	**Essity Hygiene and Health Aktiebolag (Göteborg, SE)**

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Background/Summary

TECHNICAL FIELD

[0001] This disclosure relates to a disposable absorbent hygiene product comprising a chassis having first and second end portions and a central portion extending therebetween, a pair of side portions extending on each side of the first end portion in a transversal direction, and at least one fastener arranged on at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product to fasten the absorbent hygiene product to the waist of a wearer.

BACKGROUND

[0002] Absorbent products, also called disposable absorbent hygiene products, in the form of disposable diapers and incontinence briefs, also called open diapers or all-in-one diapers, are generally known in which the absorbent product is provided with a fastening system including a pair of side panels with fasteners such as fastening tabs secured to both sides of one end region of the diaper. The fastening tabs are intended to engage receiving means located on the other end region of the diaper. Such a diaper is generally placed on the wearer when the wearer is lying down.

[0003] Another kind of absorbent product is a belted absorbent product, which allows a wearer or caregiver to apply the diaper in a standing position. A belted absorbent product, i.e. a belt product, typically has a belt attached integrally with a chassis of the absorbent product. The belt may have two belt portions extending on either side of the rear end of the chassis. The two belt portions are intended to be fastened around the waist of the wearer, whilst the front end of the absorbent section hangs down between the legs of the wearer. Once the belt portions have been joined together, by a fastener or such as a fastening tab, the wearer can reach between his or her legs to draw up the absorbent section between the legs and to attach the free end of the absorbent section to the belt portion, by second fasteners such as fastener tabs. Similarly, the product can be made so that the belt is fastened to the front portion of the product and is secured around the back of the wearer. In this case, the absorption section will be hanging down in the front and will be secured to the belt in the back. This type of product is particularly useful for caregivers who care for patients that may have dementia or the like.

[0004] Both types of absorbent products use fastening systems to fasten the product to the wearer. Various types of fastening systems for connecting or holding together portions of absorbent products and/or for securing an absorbent product upon a wearer of an absorbent product are known. Easy removal of an absorbent product and/or easy adjustment of an absorbent product during use may be desirable. Examples of refastening systems comprise adhesive tapes and hook-and-loop fastening systems. Hook-and-loop fastening systems are for example sold under the trademark Velcro®. Hook-and-loop fasteners generally comprise two strips or patches which are attached (glued, heat sealed, welded . . .) to the opposing surfaces to be fastened. The first strip/patch comprises hooks, the second strip/patch comprises loops. When the two strips/patches are pressed together, the hooks catch in the loops and the two strips/patches fasten.

[0005] When in use, both types of absorbent products will be secured to the wearer as described in the above by means of the fastener or fasteners being fastened to a designated fastening area of the product, such as to a complementary hook/loop element. Also, for adjusting the fit of the product, or for removing the product from the wearer, there is a need to enable removal of the fastener from a fastened position. Further, both types of absorbent products may initially be provided in a folded

condition, wherein the fastener may be fastened to a designated fastening area of the product, or to another part of the product.
[0006] For example, both types of absorbent products are usually folded in a bag and during the folded state the hook strip/patch may, temporary, be attached on the topsheet or the backsheet of the absorbent product. Also during use the hook strip/patch can accidently, for example during adjustment of the product become attached to the topsheet or the backsheet of the absorbent product.
[0007] In the situations exemplified in the above where a wearer or caregiver is to handle the fastener, it is desired to provide a product with a fastener that is easy to identify and to use.
[0008] When removing a fastener from a fastened position in which it is fastened to an underlying material, such as for example to a designated fastening area or to another area of the product, peel and shear forces need to be overcome to break the connection between the fastener and the underlying material. Thus, if a wearer or caregiver fails to identify the fastener and instead attempts to remove the fastener from the fastened position by gripping and pulling of the product part which carries the fastener (such as e.g. pulling a belt or a side portion to which the fastener is attached) there may be a risk that the forces applied will damage the material of the belt or side portion, and/or risk removing the fastener from the product part by breaking the attachment to the product part, rather than removing the fastener from the fastened position.
[0009] Thus, there is a need to provide a product with a fastener which facilitates identifying the fastener so as to reduce the risk of a user or caregiver gripping another part of the product when desiring to remove the fastener from a fastened position.
[0010] Application and removal of absorbent products to/from a wearer may take place under various conditions, for example in poor light conditions such as when it is not desired to disturb a user by lighting up during night-time. Also, the user's mobility status or other conditions may require a caregiver to apply the product to/from the user from positions where the fasteners may be difficult to reach and/or to see. As such, there is a need to provide a product with a fastener which facilitates identifying the fastener also when visual identification is not possible.
SUMMARY
[0011] It is desired to provide an improved disposable absorbent hygiene product which uses a fastener to fasten the absorbent product to the waist of a wearer, and which fulfils one or more of the above-mentioned needs. In accordance with the present disclosure, there is provided a disposable absorbent hygiene product according to the appended claims.
[0012] “Absorbent products” also called disposable absorbent hygiene products refer to consumer products which absorb and contain body exudates, and more specifically, refers to products which are placed against or in proximity to the body of the wearer to absorb and contain the various exudates discharged from the body. Absorbent products comprise, for example, diapers and incontinence devices. Diapers comprise for example all-in-one diapers, pant diapers and belt diapers. The diapers can be diapers for babies, young children or adults.
[0013] So-called all-in-one diapers, also called open diapers are characterized in that they include fastening tabs/panels with which the front and rear portion of the diaper are joined when the diaper is applied around the waist of a wearer.
[0014] So-called pant diapers are characterized in that the front and rear portion of the diaper are joined at the waist. This type of diaper is intended to be put on a wearer precisely like a pair of underpants, i.e. drawn over the wearer's legs. The joining at the waist part of the pant diapers can usually be broken open to remove the pant diapers from the wearer so that is not required to pull the pants down over the wearer's legs and feet to remove the pant diaper. Pant diapers normally comprise both elastic areas in the waist section and around the leg openings. Pant diapers that can be opened and reclosed by means of refastening means also exist. Such pant diapers can be opened for example to check whether the product has been soiled or in order to adjust the width of the product and then reclosed afterwards.

[0015] So-called belt diapers/belt products are characterized in that they comprise a belt that is transversely oriented in relation to the chassis of the diaper and which is attached integrally with a chassis. An absorbent core is arranged in the chassis. The belt may have two belt portions extending on either side of the rear end or the front end of the chassis. When putting on a belt diaper, the two belt portions are intended to be fastened around the waist of the wearer in a first stage. The front end or the rear end of the chassis of the belt diaper is hanging loose from the belt between the legs of the wearer. Once the belt portions have been joined together, the absorbent chassis is led between the wearer's legs and fastened to the belt. The belt comprises fixing surfaces intended to stick to a fixing element arranged on the chassis of the diaper by its free transverse edge. This type of product is particularly useful for caregivers who care for patients that may have dementia or the like.
[0016] Another type of belt diaper is in the form of a two-piece product that comprises a separate belt and a separate chassis with an absorbent structure. When in use the belt is fastened around the wearer's waist, following which the chassis is joined to the outside of the belt by means of hook and loop elements or tape elements in the corners of the chassis.
[0017] The absorbent product according to the present disclosure is a disposable product. The term “disposable” is used to describe absorbent products which generally are not intended to be laundered or otherwise restored, or reused as an absorbent product, e.g., they are intended to be discarded after a single use and may also be configured to be recycled, composted or otherwise disposed of in an environmentally compatible manner.
[0018] The term “longitudinal” or “longitudinally” relates to the length or the lengthwise direction, and in particular the direction running between the first end portion and the second end portion of the product or between the front and the back of the wearer.
[0019] The term “transversal” or “transversally” relates to the width or width wise direction and corresponds to the direction that is perpendicular to the longitudinal direction. The transversal direction runs from side to side, and in particular from the left side to the right side of the wearer, and vice versa.
[0020] A disposable absorbent hygiene product in accordance with the present disclosure comprises a chassis having first and second end portions and a central portion extending therebetween, said chassis having an body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer, a longitudinal axis extending in a longitudinal direction and defining a longitudinal direction from said first end portion towards said second end portion and a transversal axis defining a transversal direction perpendicular to the longitudinal direction. The chassis comprises a liquid permeable topsheet at the body facing surface, a liquid impermeable backsheet at the garment facing surface, and an absorbent core assembly comprising at least one absorbent core arranged between said topsheet and said backsheet. Said disposable absorbent hygiene product further comprises a pair of side portions extending on each side of the first end portion in said transversal direction to fasten the disposable absorbent hygiene product to the waist of a wearer. Said disposable absorbent hygiene product comprises at least one fastener arranged on at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product to fasten the disposable absorbent hygiene product to the waist of a wearer. Said fastener comprises a sheet formed base having generally parallel upper and lower surfaces with said lower surface attached to at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product. Said sheet formed base having a length in the longitudinal direction and a width in the transversal direction and comprises at least one fastening area comprising one or more areas of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base. Said fastening area is arranged at a distance from one outer edge of said sheet formed base forming an area free of fastening material on said sheet formed base. Said fastener is attached to said disposable absorbent hygiene product in an

attachment area which overlaps at least partly with the fastening area.
[0021] The pair of side portions extending on each side of the first end portion in said transversal direction to fasten the absorbent hygiene product to the waist of a wearer may be first and second belt portions if the absorbent hygiene product is a belt diaper i.e. a belt product. Alternatively, the pair of side portions extending on each side of the first end portion in said transversal direction to fasten the absorbent hygiene product to the waist of a wearer may be first and second side panels if the absorbent hygiene product is an open diaper i.e. an all-in-one diaper.
[0022] The sheet formed base of the fastener having generally parallel upper and lower surfaces with said lower surface attached to at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product may have a square shape, rectangle shape, round shape or any other shape.
[0023] For example, the sheet formed base may have a rectangle shape which may facilitate production using band-shaped base materials and minimise spilling of material.
[0024] The fastening area of the sheet formed base comprising one or more area of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base may have fastening elements evenly distributed over the whole area or in different zones, for example, stripes of fastening elements. The stems may for example be hooks which are adapted to be attached to loops. When the fastener, i.e. the area of fastening material is pressed together or arranged on a loop material the hooks catch in the loops and the two are fastened to each other. The topsheet, the backsheet or any other material of the absorbent hygiene product can act as a loop material
[0025] By having the fastening area arranged at a distance from one outer edge of the sheet formed base, an area free of fastening material is created. The outer edge may be a first outer edge. The distance may be considered being a first distance. The fastening area may be arranged at a distance from one outer edge of the sheet formed base along a first transversal direction.
[0026] The fastener can be manufactured by extruding a polymer into a mould forming the sheet formed base with the integral formed stems in the fastening area. The fastener can also be manufactured by extruding a polymer onto the sheet formed base in order to form the stems which project from the upper surface of said sheet formed base. When making the fastener the area free of fastening materials can be left free of stems or alternatively be melted in a second step.
[0027] The first transversal direction may be in a direction away from said longitudinal axis. When unfolding, removing or adjusting the product it is most common that the wearer or the caregiver grips with his/hers fingers at the outer end of the side portion and/or the outer end of the second end portion which is in the direction away from the longitudinal axis when the product is in its unfolded condition.
[0028] In accordance with a first aspect, the object as set out in the above is achieved by a product in accordance with the enclosed claim **1**. Hence, the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion and/or second end portion to which the fastener is arranged.
[0029] As such the fastener comprises an area free of fastening material extending from an outer edge of the sheet formed base, and which area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion and/or second end portion to which the fastener is arranged. When the fastener is in a fastened position wherein the fastening area is fastened to an underlying material, the area free of fastening material will remain free and unfastened to the underlying material, regardless of whether the article is in a closed condition around a user or for example in a folded delivery condition. As such, the area free of fastening material may be tactically identified by the fingers of a user when striving to remove the fastener from the fastened position, i.e. to break the connection between the fastening area and the underlying material. Further, since the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion and/or second end portion, the side portion

and/or second end portion may yield away from the user's fingers more easily than the area free of fastening material of the fastener, when the user strives to find the fastener. As such, the area free of fastening material will form a free edge portion which may be tactically identified by a user and which indicates the correct position from which the fastener is to be pulled to be released from the underlying material. The user will be urged to grip the area free of fastening material rather than the side portion and/or second end portion to which it is attached for removing the fastener from its connection to the underlying material.

[0030] Further, in accordance with a second aspect, the object as set out in the above is achieved by a product in accordance with the enclosed claim **22**. Hence, said distance from one first outer edge of said sheet formed base at which the fastening area is at least 5 mm. Further, the area free of fastening material has an extension in a direction perpendicular to said distance being at least 20 mm.

[0031] As such, the fastener comprises an area free of fastening material extending from the outer edge of the sheet formed base, and which area free of fastening material has a minimum size as defined by the above-mentioned measures. When the fastener is in a fastened position wherein the fastening area is fastened to an underlying material, the area free of fastening material will remain free and unfastened to the underlying material, regardless of whether the article is in a closed condition around a user or for example in a folded delivery condition. As such, the area free of fastening material may be tactically identified by the fingers of a user when striving to remove the fastener from the fastened position, i.e. to break the connection between the fastening area and the underlying material. As such, the area free of fastening material will form a free edge portion which may be tactically identified by a user and which indicates the correct position from which the fastener is to be pulled to be released from the underlying material. Due to the suitable size of the area free of fastening material, the user will be urged to grip the area free of fastening material rather than the side portion and/or second end portion to which it is attached for removing the fastener from its connection to the underlying material.

[0032] Although as explained in the above the first aspect and the second aspect as mentioned in the above may individually achieve the object of the invention, the two aspects may be combined.

[0033] As such, there may be provided a product according to the preamble of any of the appended claim **1** or **22**, wherein the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion and/or second end portion to which the fastener is arranged, and the fastening area being arranged at said distance from one first outer edge of said sheet formed base at which the fastening area is arranged, the distance being at least 5 mm, and the area free of fastening material having an extension in a direction perpendicular to the distance of at least 20 mm.

[0034] In the below, a number of additional optional features, advantages and embodiments will be described. Each of these features, advantages and embodiments are equally applicable to the first aspect, the second aspect and the combination of the first and the second aspect, either alone or in combination.

[0035] As mentioned in the above, the area free of fastening material may have a Bending stiffness greater than the Bending stiffness of the side portion and/or second end portion to which the fastener is arranged.

[0036] As such, the stiffness of the side portion and/or second end portion may be such that it yields more easily under a user's fingers than the area free of fastening material, enabling the user to identify the fastener.

[0037] For example, the area free of fastening material may have a Bending stiffness being at least 15%, such as at least 20% greater than the Bending stiffness of the side portion and/or second end portion. As such, the difference in stiffnesses may be such that a person gripping for the fastener will be able to easily identify and find the area free of fastening material rather than the side portion and/or the second end portion.

[0038] The Bending stiffness of the area free of fastening material may hence be selected in view of the Bending stiffness of the side portion and/or the second end portion to which it is attached.
[0039] For example, side portions such as side panels of an absorbent hygiene product may be made of materials having relatively low stiffness, such as nonwovens. For example, such side panels may have Bending stiffness of no more than 15 mgf such as no more than 10 mgf. The side panels may have a Bending stiffness of more than 1 mgf or more than 5 mgf.
[0040] Thus, for example, the Bending stiffness of the area free of fastening material could be selected to be e.g. at least 20 mgf such as at least 22 mgf.
[0041] As such, in an example, the Bending stiffness of the side portion and/or second end portion may be no more than 10 mgf, and the Bending stiffness of the area free of fastening material may be at least 20 mgf, such as at least 22 mgf. For example, the fastener may be arranged to a side panel, wherein the Bending stiffness of the side panel may be no more than 10 mgf, and the Bending stiffness of the area free of fastening material of the fastener may be at least 20 mgf.
[0042] However, to provide for easier identification, the Bending stiffness of the area free of fastening material may nevertheless be selected to be for example at least 30 mgf, such as at least 40 mgf or at least 45 mgf.
[0043] For example, the Bending stiffness of the side portion and/or second end portion may be at least 30 mgf, such as at least 35 mgf. This may be preferred for example when the side portion is a belt portion of a belted product.
[0044] For example, said bending stiffness of the area free of fastening material may be at least 30 mgf, such as at least 40 mgf or at least 45 mgf.
[0045] As such, in an example, the bending stiffness of the side portion and/or second end portion may be at least 35 mgf, and the bending stiffness of the area free of fastening material may be at least 40 mgf, such as at least 45 mgf.
[0046] The bending stiffness of the side portion and/or the second end portion may further be selected considering the need for a side portion and/or second end portion being sufficiently pliable to adapt to the wearer without causing discomfort. For example, the bending stiffness of the side portion and/or second side portion may be no more than 90 mgf, such as no more than 80 mgf or no more than 70 mgf. Also the bending stiffness of the area free of fastening material may be selected taking the comfort of the user into account. As such, the bending stiffness of the area free of fastening material may for example be no more than 100 mgf, such as no more than 90 mgf or no more than 70 mgf.
[0047] In another example, the disposable absorbent hygiene product is a belt product and said side portions are first and second belt portions for securing to each other around a waist of a wearer of the product to form a belt having an exterior surface, wherein the first belt portion has a free end which carries said fastener adapted to be attached to an exterior surface of the other of the belt portions. Optionally, in this example, the bending stiffness of the first belt portion may be at least 35 mgf, and the bending stiffness of the area free of fastening material may be at least 40 mgf, such as at least 45 mgf.
[0048] For example, the area free from fastening material of the fastener may be a continuous area, comprising the sheet formed base. This provides for easy and efficient manufacture, where the fastener may be provided as a single unit to be attached to the side portion and/or end portion.
[0049] The area free of fastening material may for example comprise only one layer. For example, the area free of fastening material may comprise a single layer of a nonwoven material or a polymer film material. In other examples, the area free of fastening material may, partly or in its entirety, comprise more than one layer. For example, the area free of fastening material may comprise a laminate of a nonwoven layer and a polymer film layer.
[0050] As mentioned in the above, the distance from one first outer edge of said sheet formed base and the fastening area may be at least 5 mm. As such, the area free of fastening material may have a size which facilitates finding the fastener. Further, when the distance is at least 5 mm, a user may

grip the area free of fastening material when removing the fastener from connection to an underlying material. As such, the area free of fastening material may provide a portion which is suitable for gripping and tactically possible to identify when the fastener is in a fastened position wherein it is attached via the fastening area to an underlying material.

[0051] For example, the fastening area may be arranged at the distance from the first outer edge of the sheet formed base arranged in a first transversal direction. As such, the area free from fastening material may provide a portion suitable for gripping the fastener from a transversal direction of the product. For example, the fastening area may be arranged at the distance from the first outer edge of the sheet formed base arranged in a first transversal direction away from the longitudinal axis. As such, the area free from fastening material may provide a portion suitable for gripping at an outer end portion of a side portion and/or second end portion, such as at an outer end portion of a belt or a side panel.

[0052] The area free of fastening material may have a transversal width being equal to the distance from the one first outer edge of said sheet formed base and the fastening area.

[0053] With the transversal width of the area free of fastening material is meant any transversal width of the fastening material as may be measured in a direction parallel to the transversal axis.

[0054] For example, distance (e.g. the transversal width) may be at least 10 mm. As such, gripping of the area free of fastening material may be further facilitated. For example, the distance (e.g. transversal width) may be from 5 to 15 mm, or from 10 to 15 mm.

[0055] For example, the area free of fastening material may have an extension in a direction perpendicular to the distance. As such, when the distance is a transversal width, the extension may be a longitudinal length of the area free of fastening material.

[0056] For example, the distance, (e.g. the transversal width) may be at least 5 mm, or any of the other ranges mentioned in the above, over at least a 20 mm continuous extension perpendicular to the distance, (e.g. over a longitudinal length), of the area free of fastening material, such as over at least 30 mm continuous extension, (e.g. longitudinal length) or at least 50 mm continuous extension, (e.g. longitudinal length).

[0057] In one alternative, the distance may be constant over the continuous extension in a direction perpendicular to the distance. For example, the transversal width may be constant over the continuous longitudinal length.

[0058] In another alternative, the distance may be varying over the continuous extension in a direction perpendicular to the distance. For example, the transversal width may be varying over the continuous longitudinal length.

[0059] For example, the distance (e.g. transversal width) may be at least 5 mm, or any of the other ranges mentioned in the above, over the entire perpendicular extension (e.g. longitudinal length) of the area free from fastening material.

[0060] For example, the distance (e.g. transversal width) may be at least 5 mm, or any of the other ranges mentioned in the above, over the entire perpendicular extension (e.g. longitudinal length) of the fastener. This is useful to promote that the area free of fastening material forms a free edge portion from the outer edge of the fastener, which may be easily identified.

[0061] Further, and as mentioned in the above, the area free of fastening material may have a perpendicular extension (e.g. longitudinal length), being at least 20 mm. For example, the area free of fastening material may have a perpendicular extension (e.g. longitudinal length) being at least 30 mm or at least 50 mm.

[0062] For example, the area free of fastening material may have a perpendicular extension (e.g. longitudinal length) being no more than 200 mm, such as no more than 150 or no more than 100 mm. In some examples, the perpendicular extension (e.g. longitudinal length) may be no more than 70 mm.

[0063] For example, the perpendicular extension (e.g. longitudinal length) may be from 30 mm to 70 mm, such as from 40 mm to 50 mm.

[0064] With the longitudinal length of the area free of fastening material is meant any longitudinal length as may be measured in a direction parallel to the longitudinal axis.
[0065] For example, the perpendicular extension of the area free of fastening material may correspond to the extension of the fastener in the direction of the perpendicular extension. For example, the longitudinal length of the area free of fastening material may correspond to the length of the fastener.
[0066] The perpendicular extension (e.g. longitudinal length) of the area free of fastening material may for example be greater than or essentially the same as the extension (e.g. longitudinal length) of the fastening area of the fastener. As such, the force from pulling of the area free of fastening material may be distributed to the fastening area to be removed from an underlying material in an advantageous manner.
[0067] For example, the area free of fastening material may be essentially rectangular. As such, the fastener may be essentially rectangular.
[0068] For example, the longitudinal length of the fastening area and/or the longitudinal length of the area free of fastening material may be selected in view of the longitudinal length of the side portions and/or second end portion to which the fastener is attached.
[0069] For example, it may be desired that the longitudinal length of the fastening area is at least 50% of the longitudinal length of the side portions and/or second end portion. For example, when the absorbent product is a belt product and the side portions is a first belt portion to which the fastener is attached, the longitudinal length of the fastening area may be at least 50% of the longitudinal length of the first belt portion.
[0070] In some embodiments, the sheet formed base may protrude over the outer edge of said side portion and/or said second end portion of said disposable absorbent hygiene product. In such embodiments, the area free of fastening material may at least partially protrude beyond the outer edge of the side portion and/or second end portion. As such, tactical as well as visual identification of the fastener may be further facilitated.
[0071] In some variants, the area free of fastening materials is partially located on the portion of the sheet formed base which protrudes over the outer edge of the side portion, and partially located on the portion of the sheet formed base which is overlapping the side portion.
[0072] In some variants, the area free of fastening material may essentially correspond to the portion of the sheet formed base which protrudes over the outer edge of the side portion and/or the second end portion. In other words, the area free of fastening material may extend over 100% of the area of the sheet formed base which protrudes beyond the outer edge of the side portion and/or the second end portion.
[0073] In some variants, the area free of fastening materials is completely located on the portion of the sheet formed base which protrudes over the outer edge of the side portion and/or the second end portion, and the fastening area is partially located on the portion of the sheet formed base which protrudes over the outer edge of the side portion and/or the second end portion. For example, the area free of fastening material may extend over at least 30%, such as at least 50% or at least 70%, of the area of the sheet formed base **200** which protrudes beyond the outer edge of the side portion and/or the second end portion.
[0074] For example, the sheet formed base may protrude over the outer edge by a distance being at least 3 mm, such as at least 5 mm. For example, the sheet formed base may protrude over the outer edge by a distance being between 3 and 15 mm such as between 5 and 15 mm.
[0075] Thus, the wearer or caregiver can optionally grip the area free of fastening material directly instead of together with the side portions and/or said second end portion of said disposable absorbent hygiene product when unfolding or adjusting the product.
[0076] The area free of fastening material may fully or partly be in a color, shape or texture different from that of the side portions and/or said second end portion of said disposable absorbent hygiene product. For example, when at least a portion of the area free of fastening material

protrudes over the outer edge of the side portion and/or the second end portion, the protruding portion may fully or partly be in a color, shape or texture different from that of the rest of the fastener. Having a different color, shape or texture from that of the side portions and/or said second end portion of said disposable absorbent hygiene product makes it easy for the wearer or caregiver to see the fastener and it will trigger the wearer or caregiver to grip the area free of fastening material instead of the side portions and/or said second end portion.

[0077] The sheet formed base may be free from fold lines. As such, the area free of fastening material will indeed extend in a transversal direction of the product so as to be easily identifiable by a user. For example, as such the desired bending stiffness of the area free of fastening material will be effective for tactically identifying the fastener. In contrast, if the sheet formed base is provided with fold lines, the sheet formed base may tend to fold away from the user's fingers when searching for the fastener.

[0078] According to one example embodiment said fastening elements are hooks. That is, at least a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base are hooks.

[0079] With “hooks” it is intended to mean the hook parts or surface protrusions of a hook-and-loop type fastener which are adapted to be fastened to a zone comprising fibrous loops, referred to as the landing zone. The hooks can have any shape. Examples of hooks comprise pins, for example straight pins, angled pins, curved pins, tapered pins, limbed or multi-limbed pins, hooks, limbed or multi-limbed hooks, mushroom shaped protrusions, and palm tree shaped protrusions. The hooks may have any type of cross-section such as round, oval, square, rectangular, or polygonal. The hooks may have a solid core. Within one fastening portion all hooks may have the same shape. Alternatively, one fastening portion may comprise several different shapes of hooks.

[0080] The fastener can be manufactured by extruding a polymer into a mould forming the sheet formed base with integral formed hooks or pin-like projections and alternatively post forming mushroom-like heads on the pin-like projections. The fastener can also be manufactured by extruding a polymer onto the sheet formed base in order to form the hooks of pin-like projections.

[0081] When making the fastener the areas free of fastening materials can be left free of hooks or pin-like projections or alternatively be melted in a second step.

[0082] The attachment area with which the fastener is attached to said disposable absorbent hygiene product overlaps at least partly with the fastening area. Thus, the fastening area overlaps at least partly the attachment area and the side portion and/or second end portion to which the fastener is attached.

[0083] For example, the attachment area may overlap the entire fastening area. In other words, the fastening area will not extend beyond the side portion and/or second end portion to which the fastener is attached.

[0084] In another example, the fastening area may extend beyond the side portion and/or second end portion to which the fastener is attached, as long as the fastening area overlaps at least partly with the attachment area and the side portion and/or second end portion.

[0085] Optionally, the attachment area with which the fastener is attached to the disposable absorbent hygiene product overlaps at least partly with the fastening area and extends outside the fastening area into the area where said sheet formed base is free of said fastening elements but inside said edge of said sheet formed base.

[0086] By letting the attachment area protrude into the area free of fastening material, the forces are distributed in a beneficial manner when removing the fastener from the material it is attached to, for example the topsheet or backsheet or any other material of the absorbent hygiene product, when unfolding the product after being removed from the package. When the wearer or a caregiver unfolds the product, they usually grip with the fingers close to the fastener. That is, the wearer/caregiver usually grips the material close to the fastener, i.e. the side portion or the second end portion and pulls the fastener via the side portion or the second end portion. With the other

hand the wearer/caregiver usually holds the rest of the product. When the wearer/caregiver starts pulling the material close to the fastener the sheet formed base and the area free of fastener, which are attached by the attachment area to the side portion or the second end portion, starts to move together with the side portion or the second end portion as the wearer pulls the side portion or the second end portion away from the material the fastening area of the fastener is attached to. That is, when the wearer/caregiver pulls the side portion or the second end portion away, the sheet formed base and the area free of fastening material start to slightly bend upwards/away from the material the fastening area is attached to. When the wearer/caregiver continues to pull the side portion or the second end portion even further away from the material, the plurality of discrete fastening elements comprising stems closest to the area free of fastening material starts to release from the material it is attached to, and the other stems are released when the wearer/caregiver pulls even further until the whole fastener is released from the material. This applies also when adjusting the product.

[0087] The attachment area may be arranged at a distance from said outer edge of said side portion and/or said second end portion. This is advantageous in view of production requirements, e.g. for applying an adhesive in the attachment area.

[0088] For example, the attachment area may be arranged at a distance from the outer edge of the side portion and/or the second end portion, wherein the distance is no more than 5 mm. As such, the portion of the side portion and/or the second end portion freely extending beyond the attachment area—in the same direction as the area free of fastening material of the fastener—is relatively small. Thus, tactical identification of the fastener is facilitated as the user may conclude that the small and possibly yielding edge of the side portion and/or second end portion is not suitable for gripping in order to remove the fastener from connection to an underlying material, and instead select to grip the area free of fastening material of the fastener (possibly together with the edge of the side portion and/or second end portion).

[0089] For example, the attachment area may be arranged at a distance from the outer edge of the side portion and/or the second end portion, wherein the distance is no more than 3 mm.

[0090] For example, the attachment area may be arranged at a distance from the outer edge of the side portion and/or the second end portion, wherein the distance is at least 2 mm less than the distance between the attachment area and the outer edge of the fastener (i.e. the outer edge of the area free from fastening material).

[0091] The fastener may be attached to said disposable absorbent hygiene product in said attachment area by adhesive, ultrasonic welding or heat sealing/welding or a combination thereof, for example. The attachment material, i.e. the adhesive or the welds may cover the all or part of the attachment area, for example the welds or the adhesive may be applied in stripes distributed evenly or uneven over the attachment area.

[0092] The adhesive may be an adhesive which is suitable for the application. For example, the adhesive may be a hotmelt adhesive which is applied during manufacture of the product or a pre-applied adhesive on the fastener.

[0093] According to one example embodiment said fastener is attached to said disposable absorbent hygiene product in said attachment area by adhesive, welding or heat sealing or a combination thereof.

[0094] In some variants, the attachment area may extend into the area where the sheet formed base is free of fastening elements. By letting the attachment area protrude into the area free of fastening material, the forces are distributed in a beneficial manner when removing the fastener from the material it is attached to, for example the topsheet or backsheet or any other material of the absorbent hygiene product, when unfolding the product after being removed from the package. When the wearer or a caregiver unfolds the product, they usually grip with the fingers close to the fastener. That is, the wearer/caregiver usually grips the material close to the fastener, i.e. the side portion or the second end portion and pulls the fastener via the side portion or the second end portion.

[0095] For example, the attachment area may extend into the area where the sheet formed base is free of fastening elements, but inside the outer edge of the sheet formed base.
[0096] According to one example embodiment said fastening area is arranged at a second distance from a second outer edge of said sheet formed base arranged on the opposite direction of said first outer edge of said sheet formed base. For example, the fastening area may be arranged at a second distance from a second outer edge of said sheet formed base arranged on the opposite direction of said first outer edge of said sheet formed base arranged in a second transversal direction forming a second area free of fastening material on said sheet formed base. Although it may not be primarily intended that the fastener shall be opened from the side of the second outer edge of the sheet formed base, providing for a second area free of fastening elements may enable a user to grip the fastener at this second area in certain circumstances. This makes it possible for the wearer or caregiver to grip on either side of the fastener and still have the advantage as described above.
[0097] For example, said attachment area may extend into the second area where said sheet formed base is free of said fastening elements but inside said second edge of said sheet formed base. By having two opposite sides in the transversal direction where the attachment area protrudes into both areas which are free of fastening area the attachment area is larger than the fastening area in both transversal directions.
[0098] According to one example embodiment said fastening area is arranged at a third distance from a third outer edge of said sheet formed base arranged in a first longitudinal direction forming a third area free of fastening material on said sheet formed base. Similar to the second area as described in the above, the attachment area may extend into the third area where said sheet formed base is free of said fastening elements but inside said third outer edge of said sheet formed base.
[0099] According to one example embodiment said fastening area is arranged at a fourth distance from a fourth outer edge of said sheet formed base arranged in a second longitudinal direction forming a fourth area free of fastening material on said sheet formed base. Similar to the second and/or third area as described in the above, the attachment area may extend into the fourth area where said sheet formed base is free of said fastening elements but inside said fourth outer edge of said sheet formed base.
[0100] According to one example embodiment said attachment area is arranged at a distance from said first outer edge and/or second edge and/or third outer edge and/or fourth outer edge and said distance is smaller than said first and/or second and/or third and/or fourth distance between said fastening area and said respective outer edge. Alternatively, the attachment area can be all the way to the first outer edge and/or second edge and/or third outer edge and/or forth outer edge, however preferably not protruding over the first outer edge and/or the second outer edge and/or the third outer edge and/or the forth outer edge.
[0101] According to one example embodiment said second and/or third and/or fourth distance is 3-10 mm, specifically 3-6 mm or more specifically 3-4 mm.
[0102] Said second and/or third and/or fourth distance may be less than said first distance, i.e. in some embodiments, less than the transversal width of the first area free from fastening elements. As such, the user is primarily urged to use the first area free from fastening elements when gripping the fastener for removing the fastener from an underlying material. For example, said second and/or third and/or fourth distance may be at least 2 mm less than said first distance.
[0103] The second outer edge, third outer edge and fourth outer edge of the fastener may be arranged so as not to protrude beyond the outer edges of the side portions and/or second end portion. For example, the first outer edge of the fastener may be arranged to protrude beyond the first outer edge of the side portions and/or second end portion as described in the above, and the second outer edge, third outer edge and fourth outer edge are arranged so as not to protrude beyond the outer edges of the side portions and/or second end portion. As such, the user is urged to grip the first area free from fastening elements for removing the fastener from an underlying material.
[0104] According to one example embodiment said first end portion is the rear region of the

disposable absorbent hygiene product and said second end portion is the front region of the disposable absorbent hygiene product and said central portion is the crotch region.

[0105] According to one example embodiment when said sheet formed base protrudes over an outer edge of said side portion and/or said second end portion of said disposable absorbent hygiene product and said attachment area is arranged at a distance from said outer edge of said side portion and/or said second end portion of said disposable absorbent hygiene product. For example, said fastening area may protrude over said outer edge of said side portion and/or said second end portion of said disposable absorbent hygiene product

[0106] According to one example embodiment said disposable absorbent hygiene product is a belt product and said side portions are first and second belt portions for securing to each other around a waist of a wearer of the product to form a belt having an exterior surface, wherein the first belt portion has a free end which carries said fastener adapted to be attached to an exterior surface of the other of the belt portions.

[0107] According to one example embodiment said disposable absorbent hygiene product is a belt product and said side portions are first and second belt portions for securing to each other around a waist of a wearer of the product to form a belt having an exterior surface, wherein the first belt portion is adapted to be attached to an exterior surface of the other of the belt portions, and wherein said second end portion of the chassis comprises said fastener for securing the second end portion of the chassis to the belt portion so that said product assumes a pant-like shape with the belt portions forming a part of a waist portion of the pant.

[0108] According to one example embodiment said side portions are side panels each comprising said fastener and connects the first and second end portions to one another, when the product is being worn, said fasteners are adapted to be attached to a contact region on the second end portion. This way the absorbent hygiene product is an open absorbent product, i.e. a so-called all-in-one diaper.

[0109] According to one example embodiment said disposable absorbent hygiene product comprises a second pair of side portions extending on each side of the second end portion in said transversal direction and wherein said side portions on said first end portion are side panels each comprising said fastener and connects the first and second end portions to one another, when the product is being worn, said fasteners are adapted to be attached to a contact region on respective side portion of said second pair of side portion. This way the absorbent hygiene product is another type of open absorbent product, i.e. a so-called all-in-one diaper.

[0110] According to one example embodiment said fastener is arranged in said second end portion of said disposable absorbent hygiene product where said topsheet and said backsheet are attached together at a bonding area, said bonding area overlapping at least partly said attachment area and extending outside said attachment area at least in said first transversal direction.

[0111] According to another example embodiment a disposable absorbent hygiene product is disclosed, said disposable absorbent hygiene product is a belt product comprising a chassis having first and second end portions and a central portion extending therebetween, said chassis having an body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer, a longitudinal axis extending in a longitudinal direction and defining a longitudinal direction from said first end portion towards said second end portion and a transversal axis defining a transversal direction perpendicular to the longitudinal direction, the chassis comprising a liquid permeable topsheet at the body facing surface, a liquid impermeable backsheet at the garment facing surface, and an absorbent core assembly comprising at least one absorbent core arranged between said topsheet and said backsheet, said disposable absorbent hygiene product further comprises a pair of side portions, in the form of belt portions, extending on each side of the first end portion in said transversal direction to fasten the absorbent hygiene product to the waist of a wearer, said disposable absorbent hygiene product comprises at least one fastener arranged on at least one of said belt portions and/or said second end portion of said

disposable absorbent hygiene product to fasten the absorbent hygiene product to the waist of a wearer, said fastener comprises a sheet formed base having generally parallel upper and lower surfaces with said lower surface attached to at least one of said belt portions and/or said second end portion of said disposable absorbent hygiene product to fasten the absorbent hygiene product to the waist of a wearer, said sheet formed base having a length in the longitudinal direction and a width in the transversal direction and comprises at least one fastening area comprising one or more areas of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base, said fastening area is arranged at a distance from one outer edge of said sheet formed base arranged in a first transversal direction forming an area free of fastening material on said sheet formed base, said fastener is attached to said disposable absorbent hygiene product in an attachment area which overlaps at least partly with the fastening area, wherein the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion and/or second end portion and/or wherein said distance is at least 5 mm, and wherein said area free of fastening material has an extension in a direction perpendicular to said distance being at least 20 mm.

[0112] The same advantages and features mentioned above also related this example embodiment.

[0113] According to another example embodiment a disposable absorbent hygiene product is disclosed, said disposable absorbent hygiene product is an open absorbent hygiene product comprising a chassis having first and second end portions and a central portion extending therebetween, said chassis having an body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer, a longitudinal axis extending in a longitudinal direction and defining a longitudinal direction from said first end portion towards said second end portion and a transversal axis defining a transversal direction perpendicular to the longitudinal direction, the chassis comprising a liquid permeable topsheet at the body facing surface, a liquid impermeable backsheet at the garment facing surface, and an absorbent core assembly comprising at least one absorbent core arranged between said topsheet and said backsheet, said disposable absorbent hygiene product further comprises a pair of side portions, in the form of side panels, extending on each side of the first end portion in said transversal direction to fasten the absorbent hygiene product to the waist of a wearer, said disposable absorbent hygiene product comprises at least one fastener arranged on at least one of said side panels of said disposable absorbent hygiene product to fasten the absorbent hygiene product to the waist of a wearer, said fastener comprises a sheet formed base having generally parallel upper and lower surfaces with said lower surface attached to at least one of said side panels of said disposable absorbent hygiene product to fasten the absorbent hygiene product to the waist of a wearer, said sheet formed base having a length in the longitudinal direction and a width in the transversal direction and comprises at least one fastening area comprising one or more area of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base, said fastening area is arranged at a distance from one outer edge of said sheet formed base forming an area free of fastening material on said sheet formed base, said fastener is attached to said disposable absorbent hygiene product in an attachment area which overlaps at least partly with the fastening area, wherein the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion and or second end portion, and/or wherein said distance is at least 5 mm, and wherein said area free of fastening material has an extension in a direction perpendicular to said distance being at least 20 mm.

[0114] The same advantages and features mentioned above also related this example embodiment.

[0115] Generally, all terms used throughout this disclosure are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to “a/an/the [element, device, component, means, step, etc]” are to be interpreted openly as referring to at least one instance of that element, device, component, means, step, etc., unless explicitly

stated otherwise.
[0116] Other objectives, features and advantages of the example embodiments of the present disclosure will appear from the following detailed disclosure, as well as from the drawings. The skilled person will readily realize that different features of the example embodiments may be combined to create embodiments other than those expressly described in the following, without departing from the scope of the present disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0117] The above, as well as additional objects, features and advantages of the present disclosure will be better understood through the following illustrative and non-limiting detailed description of example embodiments of the present invention, with reference to the appended drawings, where the same reference numerals will be used for similar elements, wherein:
[0118] FIG. **1** schematically shows a top view of a first example embodiment of a disposable absorbent hygiene product according to the disclosure in the form of an open-type diaper, i.e. open product.
[0119] FIG. **2** shows an exploded view of the disposable absorbent hygiene product in FIG. **1**.
[0120] FIG. **3** shows the disposable absorbent hygiene product in FIGS. **1** and **2** in a closed state.
[0121] FIG. **4** schematically shows a second example embodiment of a disposable absorbent hygiene product in the form of a belt product, i.e. a belt product comprising a belt, from the side that is intended to face towards the wearer when in use, and in which the belt is joined to the chassis of the product;
[0122] FIG. **5** shows an example embodiment of the belt product in FIG. **4** from the side that is intended to face towards the wearer when in use, and in which a first belt portion and a second belt portion of the belt is folded over the chassis to form a folded belt configuration;
[0123] FIG. **6** schematically shows an exploded view of the first belt portion and the second belt portion in FIG. **5**.
[0124] FIG. **7** shows an enlarged view of the outer end of the first belt portion in FIG. **4** with a first example embodiment of a fastener according to the disclosure attached to the first belt portion.
[0125] FIG. **7***a* shows cross-section A-A in FIG. **7**.
[0126] FIG. **7***b* shows cross-section B-B in FIG. **7**.
[0127] FIG. **8** shows an enlarged view of the outer end of the first belt portion in FIG. **4** with a second example embodiment of a fastener according to the disclosure attached to the first belt portion.
[0128] FIG. **8***a* shows cross-section A-A in FIG. **8**.
[0129] FIG. **8***b* shows cross-section B-B in FIG. **8**.
[0130] FIG. **9** shows an enlarged view of the outer end of the first belt portion in FIG. **4** with a third example embodiment of a fastener according to the disclosure attached to the first belt portion.
[0131] FIG. **9***a* shows cross-section A-A in FIG. **9**.
[0132] FIG. **9***b* shows cross-section B-B in FIG. **9**.
[0133] FIG. **10** shows an enlarged view of the outer end of the first belt portion in FIG. **4** with a fourth example embodiment of a fastener according to the disclosure attached to the first belt portion.
[0134] FIG. **10***a* shows cross-section A-A in FIG. **10**.
[0135] FIG. **11** shows the outer end of the first belt portion in FIG. **4** from the side with a fifth example embodiment of a fastener according to the disclosure attached to the first belt portion.
[0136] FIG. **12** shows a top view of the fastener shown in FIG. **10** arranged on the topsheet in the

front portion of the belt product in FIGS. **4**-**6**.
[0137] FIG. **13** shows cross-section A-A in FIG. **12** through a fastener arranged on the topsheet and how the topsheet is attached to the backsheet in the area of the fastener.
[0138] All the figures are highly schematic, not necessarily to scale, and they show only parts which are necessary in order to elucidate the invention, other parts being omitted or merely suggested.

DETAILED DESCRIPTION

[0139] Various aspects of the disclosure will now be described more fully hereinafter with reference to the accompanying drawings, in which example embodiments are shown. The example embodiments may, however, take many different forms and should not be construed as limited to the details of embodiment set forth herein; rather, these embodiments are provided for thoroughness and completeness. Like reference characters refer to similar elements throughout the description.
[0140] For purposes of description herein the terms “rear,” “front,”, “longitudinal,”, “inner,” “outer,”, “exterior,” and derivatives thereof relate to the example embodiments as oriented in e.g. FIGS. **1** and **4**. However, it is to be understood that the example embodiments may assume various alternative orientations, except where expressly specified to the contrary. It is also to be understood that the examples illustrated in the figures and described herein are simply example embodiments. Hence, dimensions and other physical characteristics relating to the example embodiments disclosed herein are not to be considered as limiting, unless expressly stated otherwise.
[0141] The disclosure mainly refers to disposable absorbent hygiene products, which means products that are not intended to be laundered or otherwise restored or reused as absorbent products after use. By “absorbent product” is meant a product that absorbs or is adapted to absorb bodily fluids, such as urine and/or blood, and/or contain solid excrements.
[0142] FIGS. **1** and **2** show a first embodiment of a disposable absorbent hygiene product **1** in the form of an open product, i.e. an open diaper. An open diaper is generally intended to be placed on the wearer while the wearer is lying down.
[0143] The open diaper **1** comprises a main part, i.e. a chassis **10** having a body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer. The chassis **10** comprises a liquid permeable topsheet **11** at the body facing surface, a liquid impermeable backsheet **12** at the garment facing surface, and an absorbent assembly **30** arranged between the topsheet and the backsheet, (see FIG. **2**).
[0144] In the disposable absorbent hygiene product illustrated in FIGS. **1** and **2**, the topsheet **11** and the backsheet **12** extend outside the outer contour of the absorbent assembly **30** and are joined together outside the absorbent assembly contour using methods such as gluing or welding by means of heat or ultrasound, for example.
[0145] The chassis **10** has a first end portion **15** and a second end portion **14** where the second end portion **14** is a front end portion **14** intended to be at the front (belly) waist region of the wearer, and the first end portion **15** is the rear end portion **15**, i.e. the rear region, intendent to be at the back-waist region of the wearer when the product is worn. A central portion **13** extends between the front end portion **14** and the rear end portion **15**. The chassis **10** defines a longitudinal direction L that extends from a front edge **4** of the front end portion **14** towards a back edge **5** at the rear end portion **15**, as well as a transversal direction T perpendicular to the longitudinal direction L.
[0146] Longitudinal side edges **2**, **3** connect the front edge **4** and the back edge **5** of the chassis on mutually opposite sides of an imaginary longitudinal centreline C, i.e. a longitudinal axis LO.
[0147] The open diaper **1** includes a first pair of side portions **23**, **24**, which take the form—in the illustrated embodiment—of side panels **23**, **24**. They are rear side panels **23** that are attached to the chassis **10** at the longitudinal side edges **2**, **3** close to the back edge **5** thereof.
[0148] A second pair of side portions **21**, **22** in the form of front side panels **21**, **22** are attached to the chassis **10** at the longitudinal side edges close to the front edge **4**. As an alternative the open

diaper **1** may not have a second pair of side portions at the front. That is, it may lack second front side panels **21**, **22**.

[0149] The rear side panels **23**, **24** are each provided with a fastener **25** close to an outer edge **26** of the rear side panels, i.e. the distal end of the rear side panel opposite the end that is attached to the chassis **10**. The fasteners **25** are intended to be fastened on the garment facing surface of the corresponding front side panels **21**, **22** or on the garment facing surface of the chassis **10** in order to fit the disposable absorbent hygiene product around the waist of a wearer.

[0150] Leg elastics **17** that extend in a generally longitudinal manner may be attached to the chassis **10**, such as sandwiched between the topsheet **11** and the backsheet **12** proximal the longitudinal side edges **2**, **3** for providing leg cuffs of the open diaper **1**. Alternatively or additionally to the leg elastics **17** in the example embodiment of FIGS. **1** and **2**, the defined leg cuffs may comprise one or more elastic threads, elastic film strips or elastic foam strips, and may be attached to the chassis **10** in a stretched state in order to exert a longitudinally contracting force on the open diaper **1**.

[0151] The absorbent assembly **30** is arranged between the topsheet **11** and the backsheet **12**, as is illustrated in FIG. **2**. The absorbent assembly **30** defines a longitudinal direction from a front end to a back end, and a transversal direction perpendicular to the longitudinal direction. In the open diaper **1**, the absorbent assembly **30** is aligned such that the longitudinal direction of the assembly is parallel to the longitudinal direction of the open diaper **1**, with the front end of the absorbent assembly towards the front end of the open diaper **1** and with the back end of the assembly towards the back edge of the open diaper **1**.

[0152] As illustrated in FIGS. **1** and **2**, the absorbent assembly **30** comprises two absorbent cores, a first absorbent core **31** and a second absorbent core **32** in a stacked relationship, i.e. placed on top of each other such that both the longitudinal ends of the second absorbent core are between, longitudinally inboard of, the longitudinal ends of the first absorbent core. However, the open diaper is not limited to having two cores. It may for example have only one core or more than two cores.

[0153] The first absorbent core **31** is larger than the second absorbent core **32**. The first absorbent core **31** comprises cellulosic fibres, optionally mixed with super absorbent polymers. The first absorbent core **31** extends over the full longitudinal length of the absorbent assembly.

[0154] The second absorbent core **32** is positioned in the central portion **13**. The second absorbent core **32** comprises a mixture of cellulosic fibres and superabsorbent particles.

[0155] The planar surface area of the second absorbent core **32** is smaller than that of the first absorbent core, for example, it may be less than 75%, such as less than 60% or less than 50%, for example from 40 to 75% of the planar surface area of the first absorbent core **31**.

[0156] In the embodiment illustrated in FIGS. **1** and **2**, the second absorbent core **32** is on the garment facing side of the first absorbent core **31**, positioned between the first absorbent core **31** and the backsheet **12**. In alternative embodiments, the second absorbent core **32** may be on the body facing side of the absorbent core **31**, positioned between the first absorbent core **31** and the topsheet **11**.

[0157] In a disposable absorbent hygiene product according to the present disclosure where the second absorbent core is positioned between the first absorbent core and the backsheet, the first absorbent core may partly act as a transfer layer for directing fluid away from the topsheet and into the second absorbent core, where the major portion of the liquid retention capacity is concentrated, thereby contributing to a good liquid handling in the product.

[0158] The first absorbent core **31** and the second absorbent core **32** may be in direct contact with each other, meaning that there is no additional material layer, such as a tissue or non-woven core wrap layer, between the two cores.

[0159] As illustrated in FIGS. **1** and **2** the outer contour of the absorbent assembly **30** may be hourglass shaped, such that the width of the central region is narrower than the width of the front region and the back region, respectively, where the width of the back region and the front region

may be equal or different. For example, the back region may be wider than the front region.
[0160] In alternative embodiments, the outer contour of the absorbent assembly may take different shapes, such as rectangular or oblong.
[0161] As illustrated in FIGS. **1** and **2**, an acquisition layer **16** may be sandwiched between the topsheet **11** and the absorbent assembly **30**. While an absorbent assembly **30** is intended to receive and hold large amounts of exudates, such as urine, it may be advantageous to include an acquisition layer between the topsheet **11** and the absorbent core assembly **30** to provide for interim acquisition of large amounts of liquid, as well as to provide a layer for the distribution of liquid away from the immediate place of impact.
[0162] FIG. **3** shows the open diaper described in FIGS. **1** and **2** in a closed state.
[0163] FIG. **4** shows a second embodiment of a disposable absorbent hygiene product in the form of a belt product **100**. The belt product comprises generally a belt and a chassis part. Belt products comprise a transverse belt connected to either the front or rear end part of the product's chassis part. When applying such a belt product, the belt is fixed in a first stage around the wearer's waist by a fastener. The chassis part of the belt product hangs loosely from the belt in this type of product. The chassis part is then led between the wearer's legs and attached to the belt, wherein the belt comprises fixing surfaces intended to stick fast to a fixing member or fastening device, i.e. a second and/or a third fastener, arranged on the chassis part by its free transverse edge.
[0164] FIGS. **4** and **5** schematically show some components of a belt product **100** in which the belt product **100** is shown from the side which is intended to face towards the wearer when in use.
[0165] As shown in FIG. **4** the belt product **100** comprises a chassis **110** and a waist belt. The belt in this example embodiment comprises a pair of side portions in the form of a first belt portion **123** and a second belt portion **124**.
[0166] Further, the belt product **100** has a longitudinal direction L and a transverse direction T. In other words, the belt product has a length extension in the longitudinal direction L and a width extension in the transverse direction T. Moreover, the chassis **110** has a first end portion **115**, a second end portion **114** and a central portion **113** extending there between. The first end portion **115** defines the rear end portion **115**, i.e. the rear region. The second end portion **114** defines the front end portion **114**, i.e. the front region. The chassis **110** defines the longitudinal direction L from a front edge **104** of the front end portion **114** towards a back edge **105** at the rear end portion **115**, as well as a transversal direction T perpendicular to the longitudinal direction.
[0167] Longitudinal side edges **102**, **103** connect the front edge **104** and the back edge **105** of the chassis **110** on mutually opposite sides of an imaginary longitudinal centreline C, i.e. a longitudinal axis LO.
[0168] The chassis **110** comprises a first covering layer **111**, i.e. a topsheet **111** which has a first surface intended to face towards the wearer and a second surface intended to face away from the wearer in use.
[0169] The pair of side portions in the form of a first belt portion **123** and a second belt portion **124** is attached to the chassis **110** so that the first belt portion **123** and the second belt portion **124** extend on each side of the first end portion **115** of the chassis for securing to each other around a waist of a wearer to form the belt having an exterior surface. Thus, each first and second belt portions **123**, **124** are connected to the chassis **110** in the rear end portion **115**, respectively. The first belt portion **123** is joined to the longitudinal side edge **102** and the second belt portion **124** is joined to the opposing longitudinal side edge **103**. Typically, although not strictly required, the belt portions **123**, **124** may be partly or entirely elastic.
[0170] Each belt portion **123**, **124** has an inner surface facing the wearer during use and an outer (exterior) surface facing away from the wearer during use. In the belt product **100** shown in FIG. **4**, the belt portions (first belt portion **123** and second belt portion **124**) extend in the transverse direction T of the belt product. The belt portions (first belt portion **123** and second belt portion **124**) extend also in the longitudinal direction L and have a width. The width of the belt portions may be

between 5 and 20 cm, for example between 7 and 15 cm. The first belt portion **123** and the second belt portion **124** are of the same length. In alternative embodiments, one belt portion can be longer than the other. The combined length of the two belt portions is designed to reach around a wearer's waist. The two belt portions **123**, **124** of the belt product **100** can in some embodiments be formed from only one piece of material, which piece of material extends in the transverse direction T across the entire rear end portion **115** and past the respective longitudinal side edges **102**, **103** (not illustrated).

[0171] The first belt portion **123** and the second belt portion **124** are attached to the chassis **110** so that the first belt portion **123** and the second belt portion **124** each extends on each side of the first end portion **115** of the chassis for securing to each other around a wearer of the product. To this end, as more fully described below, the first belt portion **123** has a fastener **125** on its inner surface facing the wearer during use. The fastener **125** is adapted to be attached to second belt portion **124** for securing the belt portions **123**, **124** to each other around the wearer of the product. The fastener **125** is arranged close to the outer edge **126** of the belt i.e. the distal end opposite the end of the belt portion that is attached to the chassis **110**.

[0172] In this example, as shown in e.g. FIG. **4**, the first belt portion **123** has a free end **106** which carries the fastener **125** adapted to be attached to an exterior surface of the other of the belt portions, i.e. the second belt portion **124**. The exterior surface of the second belt portion **124** may in some examples be provided with a mating fastening component (not shown) or acting itself as the mating fastening component. In this example the exterior surface of the second belt portion **124** acts as the mating fastening component. Hereby, the fastener **125** and the mating fastening component are mechanically connectable to form an interconnection between the first belt portion and the second belt portion for securing to each other around a wearer of the absorbent hygiene product.

[0173] As mentioned above, the second end portion **114** of the chassis **110** comprises at least one further fastening device. In FIG. **4** two fasteners **148**, **149** are arranged on the second end portion **114** for securing the second end portion **114** of the chassis to the belt portions **123**, **124** so that the product assumes a pant-like shape with the belt portions **123**, **124** forming a part of a waist portion of the pant. The second end portion **114** of the chassis may be secured to the exterior surfaces of the first belt portion **123** and/or second belt portion **124**. In other words, the front end portion, i.e. second end portion **114** of the chassis includes the fastening device(s), i.e. fasteners **148**, **149** for securing the front end portion of the chassis to the belt.

[0174] Turning now to FIG. **5**, the belt product **100** in FIG. **4** is depicted in a state in which the first and second belt portions **123**, **124** are folded over the topsheet **111** to form a folded belt configuration prior to use of the product. Hereby, the first belt portion **123** is arranged on top of the second belt portion **124**. The belt product is here depicted in its folded belt configuration. The belt product is usually further folded before it is arranged in a package (not shown).

[0175] As illustrated in FIG. **5**, the second belt portion **124** is arranged to overlap the chassis **110** of the product and the first belt portion **123** is arranged to overlap the second belt portion **124**. In other words, the second belt portion **124** is arranged to overlap the first end portion **115**, i.e. the rear end portion **115** of the chassis **110** and the first belt portion **123** is arranged to overlap the second belt portion **124**. To this end, the fastener **125** on the free end **106** of the first belt portion **123** is releasably attached to the exterior surface **124***a* (see e.g. FIG. **6**) of the second belt portion **124**.

[0176] The second belt portion **124** may be arranged to overlap an absorbent core assembly **131** of the product and the first belt portion **123** is then arranged to overlap the second belt portion **124**. Thus, when the first belt portion **123** and the second belt portion **124** are folded over the topsheet **111** to form the folded belt configuration prior to use of the product, the second belt portion **124** is arranged to overlap the absorbent core **131** of the product and the first belt portion **123** is arranged to overlap the second belt portion **124** (not shown).

[0177] Further, the second belt portion **124** may be releasably attached to the topsheet **111** by a

breakable adhesive. In other words, when the first belt portion **123** and the second belt portion **124** are folded over the topsheet **111** to form the folded belt configuration prior to use of the product, the second belt portion **124** is releasably attached to the topsheet **111** by a breakable adhesive (not shown).

[0178] Similarly, the first belt portion **123** may be releasably attached to the exterior surface **124***a* of the second belt portion **124** by a breakable adhesive (not shown). In other words, when the first belt portion **123** and the second belt portion **124** are folded over the topsheet **111** to form the folded belt configuration prior to use of the product, the first belt portion **123** is releasably attached to the exterior surface **124***a* of the second belt portion **124** by a breakable adhesive. The breakable adhesive is optional; however, they may help the belt portions to stay in place during manufacturing.

[0179] The belt may be inelastic or partly elastic. A partly elastic belt means that certain parts of the length of the belt have elastic properties, while certain other parts of the length of the belt do not have elastic properties. In some design variants, either one or both of the first or second belt portions **123**, **124** comprises an intermediate elastic region (not illustrated).

[0180] As mentioned above, the belt product **100** comprises a first covering layer i.e. a topsheet **111**, wherein the first covering layer comprises the first surface intended to face towards the wearer when the belt product **100** is used.

[0181] In FIG. **4** and FIG. **5** the fastening devices **148**, **149**, e.g. a first and a second fastener **148**, **149** are arranged on the side of the topsheet **111** that is intended to face towards the wearer when the belt product **100** is used. The fasteners **148**, **149** are arranged at the respective longitudinal edge **102**, **103** in the front end portion **114** of the topsheet **111**, i.e. connected to the two front corners of the chassis **110**. The fastening device, i.e. the fasteners **148**, **149** on the front end portion are intended, on application of the belt product **100** to a wearer, to be connected detachably to the belt portions **123**, **124** intended to face away from the wearer.

[0182] When a belt product **100** is to be applied to a wearer, the belt portions **123** and **124** (forming the belt) are first fixed around the wearer's waist. The front end portion **114** of the belt product **100** that hangs loosely is then led in between the wearer's legs, following which the fastening device **148**, **149** is fixed to the belt portions **123** and **124** (i.e. the belt) on the wearer's stomach on the side of the belt oriented away from the wearer.

[0183] A belt product is also conceivable in which the belt is connected to the front end portion of the belt product. Such a product is applied to the wearer in the reverse manner, i.e. after the belt has been fixed around the wearer's waist, the loosely hanging rear end part is led in between the wearer's legs and fixed to the belt at the back on the side of the belt oriented away from the wearer.

[0184] To improve the fit of the belt product **100**, the longitudinal edges **102**, **103** of the chassis **110** can be provided with leg elastic **117** arranged substantially in the longitudinal direction L of the product. The task of the leg elastics **117** includes improving the fit of the product and making the belt product **100** more like textile multiple-use briefs/pants. A leg elastic **117** may comprise one or more elastic threads that in the extended state have been joined to the topsheet by gluing, ultrasonic welding or the like. Alternatively, a leg elastic **117** can comprise elastic ribbon material of foamed material, for example. A leg elastic **117** may be arranged on the side of the topsheet **111** that is intended to face away from the wearer when in use.

[0185] The rear **115** or front **114** end portions of the belt product **100** can also be provided with so-called waist elastic **146** in the form of elastic elements arranged along a front edge **104** or back edge **105** of the belt product **100** to give the belt product **100** a soft, flexible enclosure of the wearer's waist. In FIG. **4**, only the front end portion **114** of the belt product **100** is provided with a waist elastic **146**. The waist elastic **146** includes a thin strip of elastic foam material that is attached by glue to the side of the topsheet that is intended to face away from the wearer. The waist elastic **146** is applied in a stretched state to achieve a holding-together force that stretches the belt product **100** around the wearer's waist. When the fasteners **148**, **149** are fastened to the belt it is suitable that

the waist elastic **146** is tensioned in the transverse direction T of the belt product **100** so that the front end part **114** has a smooth configuration over the wearer's stomach in use.
[0186] The belt product **100** comprises a second covering layer **112** arranged on the side of the first topsheet that is intended to face away from the wearer when in use. The second covering layer **112** is a so called backsheet **112**. The backsheet has the same extension in the L/T plane as the topsheet. The backsheet **112** is typically substantially liquid-impermeable, but other types of covering layer may be used instead. Typically, although not strictly necessary, the topsheet and the backsheet of the belt product **100** has an hourglass shape. Other shapes such as a rectangular shape, for example, may also be conceivable in other design variants.
[0187] The topsheet **111** and the backsheet **112** can be joined to one another in several different ways. Examples of joining methods are gluing, thermal fusing, ultrasonic welding or the like. For belt products **100** comprising a topsheet **111** and a substantially liquid-impermeable backsheet **112**, it is suitable for the leg elastic **117** and the waist elastic **146** described above to be arranged between the topsheet **111** and the backsheet **112**. The topsheet **111** may, in a belt product **100**, have a low absorption capacity wherein smaller bodily secretions such as occasional drops of urine, for example, initially secreted menstruation fluid or similar may be absorbed.
[0188] The belt product **100** has an absorbent assembly **130** in the form of an absorbent core **131** (see FIG. **5**) arranged between the topsheet **111** and the backsheet **112**. The topsheet **111** of a belt product according to this example may be liquid permeable. The absorbent core **131** has substantially the same profile, but a smaller surface, than the topsheet **111** and the backsheet **112**. The topsheet **111** and the backsheet **112** thus extend outside the edges of the absorbent core **131** along the entire circumference of the absorbent core **131**. The absorbent core **131** may have, like the topsheet **111** and the backsheet **112**, a front and a rear end part and a narrower crotch part located between the end parts. The belt product **100** in accordance with this example relates to a diaper intended to be used by an incontinent adult person or by a child who has not yet become continent. Upon use of a belt product comprising the absorbent core **131**, the front part of the crotch part and the front end part principally act like a receiving area for urine, while the rear part of the crotch part and the rear end part act mainly as a receiving area for faeces. The topsheet **111** and the backsheet **112** are connected to one another outside the absorbent assembly **130** along its entire circumference.
[0189] Turning now to FIG. **6**, there is depicted an enlarged view of a section of the belt, i.e. the first belt portion **123** and the second belt portion **124**, of a product described in conjunction with FIGS. **4** and **5**. FIG. **6** is an exploded view of the belt portions for ease of illustrating the components of those components. As mentioned above, the first belt portion **123** of the waist belt is intended to be interconnected to the second belt portion **124** by the fastener **125** for securing to each other around a wearer of the belt absorbent hygiene product. Further, as described in relation to FIGS. **4** and **5**, the second end portion **114** of the chassis **110** comprises the fastening devices, i.e. the fasteners **148**, **149** for securing the second end portion **114** of the chassis to the belt portion so that the product assumes a pant-like shape with the belt portions forming a part of a waist portion of the pant. The fasteners **148**, **149** are two separate fasteners, as shown in FIGS. **4** and **5**. However, it may also be provided as an extended piece of a fastener across a length of the second end portion, as seen in the transverse direction T. The second end portion **114** of the chassis may be secured to any one of the belt portions **123**, **124**. Typically, the second end portion **114** of the chassis **110** may be secured to both belt portions, i.e. to the exterior surfaces **123***a*, **124***a* as shown in FIG. **6**.
[0190] Further, in all example embodiments described herein in relation to the belt product **100**, and in other possible example embodiments, a part of any one of the first and second belt portions extending from the first end portion of the product is typically permanently attached to the first end portion. In other words, an end portion opposite the free end portion **106**, of the first belt portion **123** is here permanently attached to the first end portion **115** of the chassis. Analogously, an end portion of the second belt portion **124** is here permanently attached to the first end portion **115** of

the chassis
[0191] The belt portions **123**, **124** may for example be made of one layer of fibrous material, such as by a nonwoven, e.g. a spunbond nonwoven. The belt portions **123**, **124** may in another example be a flexible laminate of at least two layers of fibrous material bonded together in a bonding pattern provided by ultrasonic, laser and/or heat, for example. If it is a flexible laminate at least some of the fibers in the layers of fibrous material should be meltable by such bonding techniques. As an alternative the laminate may comprise at least three fibrous material layers. One outer layer intended to form the outside of the belt is a fibrous material adapted to serve as an attachment surface for the fasteners **148**, **149** on the front portion **114**. Examples of nonwoven materials are spunbond, meltblown, carded bonded materials etc. The middle layer may be of a relatively tear strong fibrous material, such as a spunbond or meltblown material comprising continuous filaments. The other outer layer intended to form an inner layer of the belt facing the wearer, may be of a soft and skin friendly fibrous material. Examples of suitable materials are spunbond and meltblown materials, carded bonded materials etc. Examples of polymer materials used in the different fibrous materials suitable for this purpose include polypropylene, polyethylene, polyester and/or so called bicomponent fibers. The basis weight of the nonwoven laminate can vary between about 40 and about 150 gsm, for example between about 60 and about 120 gsm, and specifically between about 75 and about 105 gsm. One or more layers of the laminate may be creped. For example, the outer layer intended to act as receiving material for the fastening means, especially as a loop material for a hook-and-loop type fastener, is creped. By the creping the loop function of the material is improved.
[0192] As mentioned above, the belt product is typically a disposable absorbent hygiene product such as a diaper and an incontinence guard.
[0193] Both example embodiments illustrated in FIGS. **1**-**6** comprise as described a topsheet **11**, **111**, a backsheet **12**, **112** and an absorbent core assembly **30**, **130** there between with at least one absorbent core **31**, **32**, **131**.
[0194] The topsheet in both embodiments is a liquid permeable topsheet **11**, **111** arranged at the boldfacing side of the disposable absorbent hygiene product. Materials suitable for topsheets are commonly known in the art of disposable absorbent hygiene products, and for the purposes of the present disclosure any material commonly known for use as a topsheet material may be used, including, but not limited to non-woven materials and perforated polymeric films.
[0195] The topsheet **11**, **111** is suitably sufficiently fluid permeable to allow discharged body fluids such as urine to penetrate through the thickness of the topsheet **11**, **111**. Also, the topsheet **11** is suitably manufactured from a material which is compliant and soft feeling to the skin of the wearer.
[0196] The topsheet **11**, **111** may be manufactured from various web materials such as woven and nonwoven webs, perforated films, open cell foams, or combinations or laminates of the above-mentioned materials.
[0197] In the context of the present disclosure, a “nonwoven” is a manufactured sheet, web or batt of directionally or randomly orientated fibers, bonded by friction, and/or cohesion and/or adhesion, excluding paper and products which are woven, knitted, tufted, stitch-bonded incorporating binding yarns or filaments, or felted by wet-milling, whether or not additionally needled. The fibers may be of natural or man-made origin and may be staple or continuous filaments or be formed in situ. Commercially available fibers have diameters ranging from less than about 0.001 mm to more than about 0.2 mm and they come in several different forms: short fibers (known as staple, or chopped), continuous single fibers (filaments or monofilaments), untwisted bundles of continuous filaments (tow), and twisted bundles of continuous filaments (yarn). Nonwoven fabrics can be formed by many processes such as meltblowing, spunbonding, solvent spinning, electrospinning, and carding.
[0198] A nonwoven material suitable as a topsheet can be manufactured from synthetic fibres such as polyester or polypropylene, or natural fibres such as cotton fibres. A mix of synthetic and natural fibres may also be used.

[0199] The nonwoven materials to be used for the topsheet **11**, **111** may for example be made of a spunbond, a spunbond/spunbond composite or a spunbond/meltblown composite, such as a SMS (spunbond/meltblown/spunbond), SSMS, SSMMS, SMMS, nonwoven material of polypropylene or bicomponent fibers of polypropylene and polyethylene, or of a combination of such materials. The topsheet **11** may also have elastic properties.
[0200] The topsheet **11**, **111** may be hydrophilized in order to improve the tendency for urine to penetrate the topsheet into the underlying structures. Methods for hydrophilizing nonwovens are known and include coating the nonwoven material with a hydrophilic coating, such as by applying a surfactant coating; by applying a hydrophilic monomer composition and a radical polymerization initiator onto the nonwoven followed by initiating a polymerization reaction on the nonwoven; by applying a coating of hydrophilic nanoparticles; or by treating the nonwoven surface with a high energy treatment (corona, plasma).
[0201] A surfactant coating may be obtained for example by applying a surfactant composition to the non-woven material by any suitable means including spraying, slot coating, kiss roll coating and/or soaking the material in a bath containing the surfactant. The hydrophilization treatment may be performed in-line during assembly of the absorbent hygiene product, or may performed separately and the topsheet may then delivered as ready-to-use rolls to the disposable absorbent hygiene product manufacturing plant.
[0202] The topsheet material may have a basis weight of from 8 to 20 g/m.sup.2, such as from 12 to 17 g/m.sup.2. However, the disclosure is not limited to topsheet materials having this basis weight only.
[0203] The backsheet **12**, **112** of both embodiments is arranged at the garment facing side of the disposable absorbent hygiene product. Materials suitable as backsheets are commonly known in the art of disposable absorbent hygiene products. The backsheet **12**, **112** prevents the exudates absorbed by the absorbent assembly from soiling other external products that may contact the disposable absorbent hygiene product, such as bedsheets and undergarments. The backsheet **12**, **112** may be substantially impermeable to liquids, such as urine.
[0204] The backsheet may be substantially liquid impermeable but breathable, i.e. gas permeable, implying that water vapour, air and other gases may pass through the backsheet **12**, **112** while being substantially impermeable to liquids.
[0205] For the purposes of the present disclosure, any material commonly known for use as a backsheet material may be included in the backsheet, including but not limited to polymeric films, for example films of polyethylene, polypropylene or copolymers of polyethylene or polypropylene, hydrophobized nonwoven materials, fluid impermeable foams and fluid impermeable laminates.
[0206] The backsheet may comprise one or more layers of material. For example, the backsheet may be a laminate of a liquid impermeably polymeric film towards the absorbent assembly and nonwoven towards the garment side, to provide a textile, soft feeling to the outer surface of the disposable absorbent hygiene product.
[0207] It is also contemplated that the backsheet may be made or otherwise include an entirely or partially elastic material in order to give the product a better fit when in use.
[0208] The absorbent assembly **30**, **130** of both examples can comprise one or more absorbent cores. The cores can be constructed from one or more layers of cellulose fluff pulp. The cellulose fluff pulp can be mixed with fibres or particles of a highly absorbent polymer material, so-called superabsorbent polymers, of the type that chemically binds large quantities of fluid on absorption with the formation of a fluid-holding gel. The absorbent core can also comprise highly absorbent polymer material arranged in a layer inside the absorbent core or connected to the surface or surfaces of the absorbent core. The absorbent core can also include further components for improving the properties of the absorbent core. Examples of such components are binding fibres, various types of fluid-dispersing layers or fibres, dimensionally stabilising components, reinforcing fibres or the like.

[0209] Superabsorbent polymers are well-known in the field of absorbent products and are used to help improve the absorbent properties of such products. Superabsorbent polymers are constituted by water-swellable and water-insoluble polymers that are capable of absorbing large quantities of fluid upon formation of a hydrogel, such as capable of absorbing at least 5 times their weight of an aqueous 0.9% saline solution as measured according to the method NSWP 241.0.R2 (15). The superabsorbent polymer polymers for use in accordance with the present disclosure may be inorganic or organic crosslinked hydrophilic polymers, such as polyvinyl alcohols, polyethylene oxides, crosslinked starches, guar gum, xanthan gum, crosslinked polyacrylates, and the like. The polymers may be in the form of powders, granules, microparticles, films, foams and fibers, for example. Upon contact with fluids, such super absorbent polymers swell by absorbing the fluids into their structures. In general, super absorbent polymers can quickly absorb fluids insulted into such products, and can retain such fluids to prevent leakage and help provide a dry feel even after fluid insult.

[0210] The type of super absorbent polymer used in an absorbent assembly of the embodiments discussed herein may be the same or may vary within the assembly. For example, a super absorbent polymer with a first set of characteristics may be used in the front and back regions of the absorbent assembly, or in a first absorbent core, and a super absorbent polymer with a second set of characteristics may be used in the central region of the absorbent assembly, or in a second absorbent core. The characteristics referred to in this section is for example the centrifuge retention capacity (CRC), absorption under load (AUL) and/or the gel layer permeability (GLP).

[0211] Acquisition layer was mentioned in relation to the open diaper, but can also be use in a belt product. Materials suitable as acquisition layers, also referred to in the art as transfer layer, or ADL (acquisition and distribution layer), are commonly known in the art of disposable absorbent hygiene products, and for the purposes of the present disclosure, any material known to the person skilled in the art as being useful as an acquisition layer may be used. An acquisition layer may for example be in the form of an airlaid layer, a spunlace layer, a high-loft, foam or any other type of material layer which may be used in an absorbent hygiene product to act as a liquid acquisition and absorption layer. The acquisition layer is suitably adapted to quickly receive and temporarily store discharged liquid before it is absorbed by the absorbent core. Such acquisition layer may be composed of for example airlaid nonwoven, spunlace nonwoven, high loft nonwoven or foam materials. An airlaid nonwoven may be produced with fluff, wood pulp, and here the fluff fibres are dispersed into a fast-moving air stream and condensed onto a moving screen by means of pressure and vacuum. The acquisition layer may preferably be of an air-through bonded nonwoven of polyester fibers.

[0212] The term “nonwoven” mentioned in relation to the different parts of the disposable absorbent product disclosed in FIGS. **1**-**6** such as topsheet, backsheet and or side portions, which in term of their properties are located between the groups of paper and cardboard on the one hand and textiles on the other hand. As regards nonwovens, a large number of extremely varied production processes are used, such as airlaid, wetlaid, spunlaced, spunbond, meltblown techniques etc. The fibres may be in the form of endless fibres or fibres prefabricated with an endless length, as synthetic fibres produced in situ or in the form of staple fibres. Alternatively, they may be made from natural fibres or from blends of synthetic fibres and natural fibres.

[0213] Further components commonly employed in disposable absorbent hygiene products shown but not illustrated in the figures of the present disclosure may be employed in a disposable absorbent hygiene product according to the present disclosure. For example, raised elastic members, commonly known as standing gathers, may be attached to the topsheet.

[0214] A wetness indicator, for example a material that changes its color upon contact with urine, may be included in the disposable absorbent hygiene product, such as disposed between the absorbent assembly and the backsheet and visible through the backsheet, such as to indicate whether a wetting event has taken place.

[0215] Both example embodiments of disposable absorbent hygiene products shown in FIGS. **1-6** comprise fasteners in order to fasten the product to the wearer.
[0216] In FIGS. **1-3** two fasteners **25** are attached to the side panels **23**, **24** of the open diaper **1**. Each side panel has a fastener. In FIGS. **4-6** one fastener **125** is attached to the first belt portion **123** of the belt product in order to connect the two belt portions **123**, **124** around the wearer. The fastener **125** could alternatively be attached to the second belt portion **124**. Two further fasteners **148**, **149** are attached to the topsheet on the second end portion **114**, i.e. the front portion of the absorbent product.
[0217] The fasteners **125**, **148**, **149** used in the belt product **100** may all have the same design, or they may differ. The fasteners **25** used in the open diaper **1** may both have the same design, or they may differ.
[0218] One fastener will now be described in more detail and shown in the example embodiments in FIGS. **7-13**. The fastener shown in FIGS. **7-11** is exemplified as the fastener **125** arranged on the first belt portion **123** of the belt product **100** in FIGS. **4-6**. However, the fastener described could also be a fastener **148**, **149** which can be attached to the topsheet **111** on the front portion **114** of the belt product **100** or to the respective side panels **23**, **24** of the open diaper **1**.
[0219] FIG. **7** shows a first example embodiment of the fastener **125** which is attached to the belt portion **123** of the belt product in FIGS. **4-6**. The shape of the fastener **125** is rectangular, however the fastener is not limited to this shape. The fastener can have the shape of a square, circle, hexagon etc.
[0220] The fastener **125** comprises a sheet formed base **200** (see also FIG. **7***a* and FIG. **7***b*) having generally parallel upper and lower surfaces **201**, **202**. The lower surface **202** of the sheet formed base **200** is attached to the belt portion **123**. The sheet formed base **200** has a width W**200** in the transversal direction T limited by a first outer edge **204** and a second outer edge **205** and a length L**200** in the longitudinal direction L of the belt diaper limited by a third and a fourth outer edge **206**, **207**.
[0221] The sheet formed base **200** has one fastening area **203** comprising one area of fastening material **203** comprising a plurality of discrete fastening elements comprising stems (not explicitly shown) which project from the upper surface **201** of said sheet formed base over the whole area. Alternatively, as shown in FIG. **8** and FIG. **8***a* the fastening area **203** comprises several areas of fastening material, here exemplified as three areas of a fastening material **203***a*, **203***b*, **203***c* comprising a plurality of discrete fastening elements comprising stems that project from the upper surface **201** of said sheet formed base. Hence, the fastening area **203** is the area covering all three areas of fastening material **203***a*, **203***b*, **203***c*, i.e. including the spaces between the three areas of fastening material **203***a*, **203***b*, **203***c*.
[0222] FIG. **7** shows the end of the first belt portion in FIG. **4** with the fastener **125** arranged close to the outer edge **126** of the belt **123**. When opening the belt, for example, when the belt product is in a folded belt configuration prior to use of the product or when adjusting or removing the product on a wearer, the wearer or the caretaker can grip the end of the belt portion and pull.
[0223] As shown in FIGS. **7** and **7***a* (FIG. **7***a* shows the cross-section A-A in FIG. **7**) the fastening area **203** is arranged at a first distance D**1** from the first outer edge **204** of said sheet formed base **200** arranged in a first transversal direction forming an area **208**, i.e. a first area free of fastening material **208** arranged on said sheet formed base **200**. The first transversal direction is the direction away from the longitudinal axis when the absorbent product is in its unfolded condition (see FIG. **4** for the belt product, and FIG. **1** for the open diaper).
[0224] The area free of fastening material **208** may have a Bending stiffness greater than the Bending stiffness of the belt **123** which the fastener **125** is arranged.
[0225] For example, the area free of fastening material **208** may have a Bending stiffness being at least 15%, such as at least 20% greater than the Bending stiffness of the belt **123**.
[0226] The difference in stiffnesses may be such that a person gripping for the fastener **125** by

approaching his/her hand towards the outer edge **126** of the belt **123** will be able to easily identify and grip the area free of fastening material **208** rather than the outermost end of the belt **123**. For example, the outermost end of the belt **123** may yield more easily under the user's hand leaving the relatively stiffer area free of fastening material **208** of the fastener **125** easily greppable.
[0227] The Bending stiffness of the area free of fastening material **208** may hence be selected in view of the Bending stiffness of the belt.
[0228] For example, in a belted product such as exemplified in FIGS. **7** to **7***b*, the belt **123** may have a Bending stiffness of at least 30 mgf, such as at least 35 mgf. For example, the area free of fastening material may be selected to be at least 40 mgf or at least 45 mgf.
[0229] As such, in an example, the Bending stiffness of the belt **123** may be at least 35 mgf, and the Bending stiffness of the area free of fastening material **208** may be at least 40 mgf, such as at least 45 mgf.
[0230] For example, the belt may be of a suitable belt material such as the single layer materials or the laminate materials mentioned in the above, having a basis weight of about 60 to 80 gsm and having a bending stiffness of about 35 to 40 mgf.
[0231] The fastener may be of a fastener material such as for example a hook material, wherein the area free of fastening material (e.g. the sheet formed base) may be of a material such as mentioned in the above, for example comprising a nonwoven material, having a basis weight of 50 to 60 gsm and having a bending stiffness of about 45 to 55 mgf.
[0232] The area free of fastening material **208** may have a transversal width D**1** being at least 5 mm. As such, a user may grip the area free of fastening material when removing the fastener from connection to an underlying material.
[0233] For example, the transversal width may be at least 10 mm. As such, gripping of the area free of fastening material may be further facilitated. For example, the transversal width may be from 5 to 15 mm, or from 10 to 15 mm.
[0234] Further, and as mentioned in the above, the area free of fastening material **208**, **209** may have a longitudinal length L**1**, being at least 20 mm. For example, the area free of fastening material may have a longitudinal length being at least 30 mm or at least 50 mm.
[0235] With the longitudinal length of the area free of fastening material is meant the maximum longitudinal length as may be measured in a direction parallel to the longitudinal axis.
[0236] As exemplified in the embodiments of the Figures, the transversal width D**1** of the area free of fastening material **208** may be essentially constant over the length L**200** of the sheet formed base **200**.
[0237] For example, the area free of fastening material **208** may be essentially rectangular. This may be preferred for example when, as in the embodiments of the Figures, the fastener **125** is essentially rectangular.
[0238] The longitudinal length L**208** of the area free of fastening material **208** may for example be greater than or essentially the same as the longitudinal length of the fastening area **203** of the fastener **124**. As such, the force from pulling of the area free of fastening material **208** may be distributed to the fastening area **203** to be removed from an underlying material in an advantageous manner.
[0239] The longitudinal length of the fastening area **203** and/or the longitudinal length L**208** of the area free of fastening material **208** may be selected in view of the longitudinal length of the belt **123** to which the fastener is attached.
[0240] For example, it may be desired that the longitudinal length of the fastening area **203** is at least 50% of the longitudinal length of the belt **123**.
[0241] In some variants, the longitudinal length L**200** of the sheet formed base **200** may be essentially similar to the longitudinal length of the belt **123**.
[0242] In other variants, as illustrated in the Figures, the longitudinal length L**200** is less than the longitudinal length of the belt **123**. For example, the longitudinal length L**200** of the sheet formed

base **200** of the fastener **125** may be at least 50% of the longitudinal length of the belt **123**.
[0243] As exemplified in the embodiments of the Figures, the sheet formed base **200** may be free from fold lines. With “fold line” is meant any line in the sheet formed base being folded or having been folded so as to imply a higher tendency of the sheet formed base **200** to fold along the fold line. As such, when the sheet formed base **200** is free from fold lines it will lack any tendency to fold in either direction, and hence the resistance to yielding as felt when grasping for the fastener results essentially from the bending stiffness inherent in the material of the fastener **125**, as attached via the attachment area **212** to the belt **123**.
[0244] In some embodiments, where the fastener may be initially folded to a transport configuration, the sheet formed base **200** may possibly comprise a fold line in an area outside the fastening area, but on another side than the area free of fastening material. As such, the sheet formed base **200** is, at least in the area free of fastening material **208**, and optionally also in the fastener area **203**, free from fold lines.
[0245] As such, the fastener may be such that at least the area free from fastening material displays the same bending stiffness regardless of the orientation in which the bending stiffness is measured, i.e. the area free of fastening material displays a homogenous stiffness.
[0246] As such, the Bending stiffness of the material in the area free of fastening material **208** will indeed be relevant for the way in which the fastener **125** may be tactically identified.
[0247] For example, and as illustrated in FIGS. **7** to **7***a*, the attachment area **212** may be arranged at a distance E**1** from the outer edge **126** of the belt **123**. This is advantageous in view of production requirements, e.g. for applying an adhesive in the attachment area **212**.
[0248] For example, the attachment area may be arranged at a distance E**1** from the outer edge of the side portion and/or the second end portion, wherein the distance is no more than 5 mm.
[0249] As such, the portion of the belt **123** freely extending beyond the attachment area **212**—in the same transversal direction as the area free of fastening material **203** of the fastener **125**—is relatively small. Thus, tactical identification of the fastener **125** is facilitated as the user may conclude that the small and yielding edge of the belt **123** protruding beyond the attachment area **212** is not suitable for gripping in order to remove the fastener **125** from connection to an underlying material. Instead, the user may select to grip the area free of fastening material **208** of the fastener **125**. It will be understood that when gripping the area free of fastening material **208** in an embodiment such as illustrated in FIGS. **7** and **7***a*, the user would grip the area free of fastening material **208** together with the belt **123** to which the fastener **125** is attached.
[0250] In the example of FIGS. **7** and **7***a*, the fastening area **203** is also arranged at a second distance D**2** from the second outer edge **205** of said sheet formed base **200** arranged on the opposite direction of said first outer edge **204** of said sheet formed base **200** arranged in the second transversal direction forming a second area free of fastening material **209** on said sheet formed base **200**. The second transversal direction T is the direction towards the longitudinal axis (see FIG. **4** for the belt product, and FIG. **1** for the open diaper).
[0251] In another example, the second distance D**2** could be omitted and the fastening area **203** extend all the way from the second outer edge **205** of the sheet formed base **200**.
[0252] For example, and as illustrated in FIGS. **7** and **7***a*, the first distance D**1** may be greater than the second distance D**2**. Accordingly, gripping of the fastener at the first area free of fastening material **208** adjacent the outer transversal edge of the belt is promoted.
[0253] In this example, the fastening area **203** is arranged over the entire longitudinal direction L of the sheet formed base **200**, as shown in FIGS. **7** and **7***b*, which shows the cross-section B-B in FIG. **7**. That is the fastening area extends between the third and fourth outer edges **206**, **207** of the sheet formed base **200**.
[0254] As in the illustrated example, the longitudinal length L**200** of the fastener **125** may be less than the longitudinal length of the side portion and/or second end portion, i.e. the belt **123** in FIG. **7**. Accordingly, the belt extends over a distance E**3** from the attachment area **212** in a direction

beyond a third edge **206** of the fastener **125** and over a distance E**4** from the attachment area **212** beyond a fourth edge **207** of the fastener **125**. The longitudinal length L**200** of the fastener **125** may for example be greater than 50% of a longitudinal length of the belt **123**. Optionally, the distances E**3**, E**4** between the attachment area **212** and the respective outer edges of the belt may be no more than 5 mm.

[0255] A second alternative embodiment of the fastener is shown in FIGS. **8**, **8***a* and **8***b*, where the belt portion **123** and the fastener **125** are of the same design as in FIGS. **7**, **7***a* and **7***b* except for the fastening area **203** which comprises several areas of fastening materials. FIG. **8***a* shows the cross-section A-A in FIG. **8** and FIG. **8***b* shows the cross-section B-B in FIG. **8**. As shown in FIGS. **8** and **8***a* the fastening area **203** is exemplified as total area of three areas of a fastening material **203***a*, **203***b*, **203***c* comprising a plurality of discrete fastening elements comprising stems which project from the upper surface **201** of said sheet formed base **200**. Hence, the fastening area **203** is the area covering all three areas of fastening material **203***a*, **203***b*, **203***c*. That is, in the transversal direction the area is limited by the outer edges of the first area **203***a* and the third area **203***c*. The other features are the same as described in the above in relation to FIGS. **7**-**7***b*, and the same reference numbers are being used and will hence not be further described. In addition to the areas of fastening materials **203***a*, **203***b*, **203***c* comprising a plurality of discrete fastening elements, adhesive may be arranged between the three areas of fastening material **203***a*, **203***b*, **203***c* on the upper surface **201** of the sheet formed base **200**. The adhesive may then increase the fastening force.

[0256] Although in FIGS. **8**, **8***a* and **8***b*, the first distance D**1** is illustrated as being approximately equal to the second distance D**2**, it will be understood that the first distance D**1** may alternatively be greater than the second distance D**2**, as illustrated and described in connection with FIGS. **7**, **7***a*, and **7***b*.

[0257] The fastening area **203** is not limited to having only one area of fastening material, as shown in FIGS. **7** **7***a*, and **7***b* or three as shown in FIG. **8**, **8***a*, **8***b*, it may have two or more areas of fastening material.

[0258] A third alternative embodiment of the fastener is shown in FIGS. **9**, **9***a* and **9***b* where the belt portion **123** and the fastener **125** are of the same design as in FIGS. **7**, **7***a* and **7***b* except for the fastening area **203** in cross section B-B in FIG. **7***b*. The other features are the same and the same reference numbers are being used and will hence not be described. FIG. **9***a* shows the cross-section A-A in FIG. **9** and FIG. **9***b* shows the cross-section B-B in FIG. **9**. FIGS. **9** and **9***b* show that the fastening area **203** can also in addition to the first distance D**1** and the second distance D**2** and the respective first and second areas free of fastening material **208**, **209** described in FIGS. **7** and **7***a* and also shown in FIG. **9***a* be arranged at a third distance D**3** from the third outer edge **206** of said sheet formed base **200** arranged in a first longitudinal direction forming a third area free of fastening material **210** on said sheet formed base **200**. The fastening area **203** can also be arranged at a fourth distance D**4** from the fourth outer edge **207** of said sheet formed base arranged in a second longitudinal direction forming a fourth area free of fastening material **211** on said sheet formed base **200**. In other words, FIG. **9** shows a fastener **125** where the fastening area **203** is surrounded by a larger area free of fastener material combined by all four areas free of fastening material **208**, **209**, **210**, **211**.

[0259] Although in FIGS. **9**, **9***a* and **9***b*, the first distance D**1** is illustrated as being approximately equal to the second distance D**2**, it will be understood that the first distance D**1** may alternatively be greater than the second distance D**2**, as illustrated and described in connection with FIGS. **7**, **7***a*, and **7***b*.

[0260] As an alternative, not shown, the fastening area **203** may only be arranged at a first distance from one outer edge of said sheet formed base arranged in a first transversal direction forming an area free of fastening material on said sheet formed base. For example, the first transversal direction may be the direction away from the longitudinal axis when the absorbent product is in its

unfolded condition (see FIG. **4**). Hence, on all other sides the fastening material may extend to the outer edges of said sheet formed base.

[0261] FIGS. **7***a* and **7***b* shows the fastener **125** attached to the disposable absorbent hygiene product in an attachment area **212** which overlaps with the fastening area **203** and extends outside the area of the fastening area **203** into the areas where the sheet formed base **200** is free of the fastening elements **208**, **209** but inside said outer edges **204**, **205** of said sheet formed base **200**. Hence, the attachment area **212** does not protrude over the outer contour of the fastener **125**. The attachment area **212** is the area where the fastener is attached to the underlying material by—for example—adhesive, heat sealing or welding or a combination thereof. The adhesive, the heat sealing or the weld accomplished by welding can be arranged over the whole attachment area, i.e. cover the whole attachment area or be distributed over the area as long the fastener is attached in the area which is free of the fastening elements **208**, **209** but inside said outer edges **204**, **205** thereof.

[0262] In FIGS. **7***a* and **7***b* the attachment area **212** is adhesive and overlaps almost the whole fastening area **203** in the transversal direction T (see FIG. **7***a*). In FIG. **7***a* it is shown that length W**212** of the attachment area **212** is longer in the transversal direction than the length W**203** of the fastening area **203**. In the longitudinal direction, see FIG. **7***b* the attachment area **112** overlaps the whole fastening area except for a small area along the third and fourth outer edges **206**, **207** due to that it is not desired to have adhesive outside the fastener. Alternatively, the attachment area can be arranged all the way to the third and fourth outer edges **206**, **207**. Hence the area of the attachment area **212** is larger than the area of the fastening area **203**.

[0263] By having the attachment area **112** larger than the fastening area **203** the forces will be distributed in a beneficial manner and reduce the risk of fastener being torn from the chassis or belt. This is especially the case when the attachment area **212** extends into the first area free of fastener **208**, which is in the direction away from the longitudinal direction when the product is in its unfolded condition and the direction where the wearer or caregiver usually grips the fastener with his/hers fingers at the outer end of the first belt portion **123** when unfolding the product or adjusting it on a wearer. When the wearer or caregiver start pulling the outer end of the first belt portion **123** the sheet formed base **200** and the area free of fastening material **208**, which are attached by the attachment area **212** to the first belt portion **123**, starts to move together with the belt portion **213** as the wearer or caregiver pulls the belt portion away from the material the fastening area **203** of the fastener is attached to.

[0264] That is when the wearer or caregiver pulls the belt portion **123** away, the sheet formed base **200** and the area free of fastening material **208** start to slightly bend upwards/away from the material the fastening area **203** is attached to. When the wearer or caregiver continues to pull the outer end of the first belt portion **123** even further away from the material, the plurality of discrete fastening elements comprising stems closest to the area free of fastening material **208** starts to release from the material it is attached to, and the other stems are released when the wearer or caregiver pulls even further until the whole fastener **125** is released from the material. This applies also when adjusting the product.

[0265] The same applies for FIGS. **8**, **8***a* and **8***b*. In FIG. **8***a* it is shown that length W**212** of the attachment area **212** is longer in the transversal direction than the length W**203** of the fastening area **203** which is limited by the three areas of a fastening material **203***a*, **203***b*, **203***c*. In the longitudinal direction (see FIG. **8***b*) the attachment area **112** overlaps the entire fastening area except for a small area along the third and fourth outer edges **206**, **207** due to a desire to avoid having adhesive outside the fastener. Hence the area of the attachment area is larger than the area of the fastening area.

[0266] FIG. **9***a* shows the cross-section A-A in FIG. **9**, which is the same as in FIG. **7***a* and will hence not be described. FIG. **9***b* shows the cross-section in the longitudinal direction where the attachment area **212** also extends into the third **210** and fourth **211** area where said sheet formed

base **200** is free of fastening elements but inside respective third **206** and fourth **207** outer edges of said sheet formed base **200**.
[0267] The respective distances D**2**, D**3** and D**4** discussed in relation to FIGS. **7**, **7***a*, **7***b*, **8**, **8***a*, **8***b*, **9**, **9***a* and **9***b* from the fastening area **203** to one out of the second, third and fourth outer edges, **205** **206**, **207** of said sheet formed base i.e. when there is an area free of fastening material on said sheet formed base may be between 3 and 10 mm, for example between 3 and 6 mm, and specifically between 3 and 4 mm. For example, each of the respective distances D**2**, D**3** and D**4** may be less than the first distance D**1** from the fastening area **203** to the first outer edge **204**. For example, each of the respective distances D**2**, D**3** and D**4** may be at least 1 mm, such as at least 2 mm or at least 3 mm less than the first distance D**1**.
[0268] The fastening area **203** described in FIGS. **7**-**9***b* comprises a plurality of discrete fastening elements (not shown) comprising stems that project from the upper surface of the sheet formed base. These stems are hooks forming a hook and loop connection with the hooks provided on first belt portion **123** and the material of the second belt portion **124** forming the loops. When the fastener **125** is used on the belt product in the front end portion **114** on the topsheet **111** i.e. connected to the two front corners of the topsheet the outer layers of the two attached belt portions act as loop elements for securing the second end portion, i.e. the front end portion **114** of the chassis to the belt portions so that the product assumes a pant-like shape with the belt portions forming a part of a waist portion of the pant.
[0269] When the fastener **125** described in FIGS. **7**-**9***b* is used in an open diaper the fastener **125** described in FIGS. **7**-**9***b* is the fastener **25** in FIGS. **1**-**3**. The fastener **25**, i.e. the fastener described in FIGS. **7**-**9***b*, is arranged on the rear side panels **23**, **24** which are attached to the chassis **10** at the longitudinal side edges close to the rear end thereof. The fasteners **25** are intended to be fastened on the garment facing surface (which will act as the loop element) of the corresponding front side panels **21**, **22** or on the garment facing surface (which will act as the loop element) of the chassis **10** in order to fit the disposable absorbent hygiene product around the waist of a wearer.
[0270] FIGS. **10** and **10***a* show a fourth embodiment of the fastener **125**′ with almost a similar design as the fastener **125** described in FIGS. **7**, **7***a*, **7***b*. It may also have the design described in relation to FIG. **8**, **8***a* and **8***b* or **9**, **9***a* and **9***b*. Only the differences between the fourth embodiment and FIGS. **7**, **7***a*, **7***b* will be described.
[0271] As exemplified in the variant of FIGS. **10** and **10***a*, the sheet formed base **200** may protrude over an outer edge **126** of the belt **123**. As such, the area free of fastening material **208** may at least partially protrude beyond the outer edge **126** of the side belt **123**. As such, tactical as well as visual identification of the fastener **125** may be further facilitated.
[0272] In some variants, as illustrated in FIGS. **10**-**10***a*, the area free of fastening material **208** may be partially located on the portion of the sheet formed base **200** which protrudes over the outer edge **126** of the belt **123**, and partially located on the portion of the sheet formed base **200** overlapping the belt **123**.
[0273] In some variants, the area free of fastening material **208** may essentially correspond to the portion of the sheet formed base **200** which protrudes over the outer edge **126** of the belt **123**. In other words, the area free of fastening material **208** may extend over 100% of the area of the sheet formed base **200** which protrudes beyond the outer edge **126** of the belt **123**.
[0274] FIG. **11** shows an alternative fastener **125**″ to the fastener **125**′ in FIGS. **10** and **10***a* where both the sheet formed base **200** and the fastening area **203** protrude over said outer edge **126** of the belt portion **123** but still leaving an area free of fastening elements **208**.
[0275] In some variants, such as illustrated in FIG. **11**, the area free of fastening material **208** is completely located on the portion of the sheet formed base **200** which protrudes over the outer edge **126** of the belt **123**, and the fastening area **203** is partially located on the portion of the sheet formed base **200** which protrudes over the outer edge **126** of the belt **123**. For example, the area free of fastening material **208** may extend over at least 30%, such as at least 50% or at least 70%,

of the area of the sheet formed base **200** which protrudes beyond the outer edge **126** of the belt **123**.
[0276] For example, and as exemplified in variants in accordance with FIG. **10**-**10**, and/or FIG. **11**, the sheet formed base **200** may protrude over the outer edge **126** of the belt **123** by a distance F**1** being at least 3 mm, such as at least 5 mm. For example, the distance F**1** may be between 5 and 15 mm.
[0277] Thus, the wearer or caregiver can optionally grip the area free of fastening material directly instead of together with the side portions and/or said second end portion of said disposable absorbent hygiene product when unfolding or adjusting the product.
[0278] The area free of fastening material may fully or partly be in a color, shape or texture different from that of the side portions and/or said second end portion of said disposable absorbent hygiene product. For example, when at least a portion of the area free of fastening material protrudes over the outer edge of the side portion and/or the second end portion, the protruding portion may fully or partly be in a color, shape or texture different from that of the rest of the fastener. Having a different color, shape or texture from that of the side portions and/or said second end portion of said disposable absorbent hygiene product makes it easy for the wearer or caregiver to see the fastener and it will trigger the wearer or caregiver to grip the area free of fastening material instead of the side portions and/or said second end portion.
[0279] The fastener **125**′ comprises a protruding portion **226**, which is part of the first area free of fastening material **208** on said sheet formed base **200**. The sheet formed base **200** protrude over the outer edge **126** of the first belt portion **123** in a belt product forming the protruding portion **226**.
[0280] If the fastener **125**′ is arranged on the second end portion **114** of the belt diaper the sheet formed base **200** protrudes over the outer edge of the second end portion, i.e. the front end portion **114** (also called front portion), in the transversal direction forming the protruding portion (not shown). If the fastener is arranged on a side panel **23**, **24** in an open diaper the sheet formed base **200** protrudes over the outer edge of the side panel forming the protruding portion (not shown). The attachment area **212**′ is similar to the attachment area **212** in FIGS. **7**, **7***a* and **7***b*. The attachment area **212**′ does not protrude over the outer edge **126** since it is not desirable to have adhesive on the outside of the product.
[0281] A protruding portion may help the caregiver to find the opening of the absorbent product, i.e. to identify the end of belt, prior to use or to easily find the fastener during use. The protruding portion allows the wearer to grasp the area free from fastening material of the protruding portion with his/her fingers. This may reduce the risk of the fastener being torn from the belt or the side panel or the second end since the wearer can grip the fastener directly instead of via the material it is attached to when unfolding the product or adjusting the product. Hence, the attachment strength between the fastener and the part it is attached to may be reduced.
[0282] The protruding portion, the area free from fastener material, or the whole fastener can be provided in a color different from that of the belt, side panel and/or the chassis so that the wearer can easily see the fingerlift portion. The sheet formed base **200** when forming a fingerlift may protrude over said outer edge **126** by at least about 5 mm, for example between about 5 and about 15 mm.
[0283] FIG. **11** shows an alternative fastener **125**″ to the fastener **125** ‘in FIGS. **10** and **10***a* where both the sheet formed base **200** and the fastening area **203** protrude over said outer edge **126** of the belt portion **123** but still leaving an area free of fastening elements **208**. The area free of fastening elements **208** will hence be free for gripping to remove the fastener from a fastened position when attached to an underlying material. The attachment area **212**′ may have the same dimensions as described and shown in FIGS. **10** and **10***a*, except that the attachment area **212**′ is arranged within the fastening area **203** at the side where the fingerlift **226** is.
[0284] FIGS. **12** and **13** shows the fastener **125**′ in FIGS. **10** and **10***a* as the fastener **148** in FIG. **4**. The fastener **125**′, **148** is arranged on the topsheet **111** in the second end portion **114** of the belt product **100**. The topsheet **111** and the backsheet **112** are attached together by a bonding area **127**.

The bonding area **127** overlaps with the attachment area **212**′, which is described in relation to FIGS. **10** and **10***a* and the bonding area **127** extends outside the attachment area **212**′ in at least one direction.

[0285] FIG. **13**, which shows the cross-section A-A in FIG. **12**, shows that the bonding area **127** overlaps the whole attachment area **212**′ and extends outside the attachment area **212**′ in both transversal directions T. The same applies for the longitudinal direction L, which can be seen in FIG. **12**. Hence, the bonding area **127** extends outside the attachment area **212**′ in all directions. This reduces the risk of the fastener being torn from the topsheet when unfolding the product or adjusting the product, since a strong laminate is provided.

[0286] In the longitudinal direction L the sheet formed base **200** and the attachment area **212**′ can have the same dimensions as described in FIG. **7***b* or **9***b*. The topsheet **111** and the backsheet **112** are attached to each other in the bonding area by for example gluing, thermal fusing, ultrasonic welding or the like.

[0287] As shown in FIG. **12**, the fastening area **203** can be arranged in an aligned position with the leg elastic **117** in the longitudinal direction to ensure a good fit and sealing to body to avoid leakage. This applies also to any of the fasteners shown in FIGS. **7**, **7***a*, **7***b*, **8**, **8***a* and **8***b* or **9**, **9***a* and **9***b* if they are arranged on the topsheet **111** in the second end portion **114** of the belt product **100**.

Bending Stiffness Measurement Method

[0288] The sheet material for evaluation should be conditioned for at least 24 hours in a laboratory environment set to 23° C.+/−1° C. and 50%+/−5% relative humidity. All measurements are made in this same environment.

[0289] Stiffness (Bending Resistance) is determined using a Gurley type tester, according to the principle described in standards ASTM D6125-97 or TAPPI T 543-05. The force required to bend a sample under controlled conditions is determined. The instrument allows for a wide variation of applied forces and specimen lengths and widths. In the context of this disclosure, the samples should be 25.4 mm (1 inch) long by 12.7 mm (0.5 inch) wide. The length direction of the sample should coincide with the longitudinal axis of the hygiene product. Samples from the relevant areas are cut from the hygiene product. However, if the stipulated sample size cannot be obtained from the area free of fastening material **208**, these samples can instead be taken from a pre-processed material sheet (i.e. as received from the material supplier).

[0290] The samples should be uniform, clean cut and free from distortions and irregularities. When testing relatively soft materials (like nonwovens) care should be taken not to clamp the sample excessively tight into the upper grip, as propensity for bending can increase along the attachment line.

[0291] The test results are reported in milligrams of force (mgf), where one milligram of force equals one Gurley Unit.

[0292] For each relevant material a series of **10** individual samples should be tested, and an arithmetic mean is calculated therefrom.

[0293] The disclosure also covers all conceivable combinations of the described aspects, variants, alternatives and example embodiments of the disclosure.

[0294] It has been disclosed that open diapers and belt diapers can comprise the fasteners in FIGS. **7-11** in various positions. It is to be understood that within one diaper different fasteners can be used in the different positions described. Alternatively, the same type of fasteners may be used for all positions.

[0295] It has been disclosed that open diapers and belt diapers can comprise the fasteners shown in FIGS. **7-11**. However, a pant diaper that can be opened and reclosed by means of refastening means can also have the fasteners shown in FIGS. **7-11**.

[0296] Furthermore, the disclosure is not limited to the aforesaid aspects or examples, but is naturally applicable to other aspects and example embodiments within the scope of the following

claims.
[0297] Reference signs mentioned in the claims should not be seen as limiting the extent of the matter protected by the claims, and their sole function is to make claims easier to understand.

Claims

1. A disposable absorbent hygiene product comprising a chassis having first and second end portions and a central portion extending therebetween, said chassis having a body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer, a longitudinal axis extending in a longitudinal direction and defining a longitudinal direction from said first end portion towards said second end portion and a transversal axis defining a transversal direction perpendicular to the longitudinal direction, the chassis comprising a liquid permeable topsheet at the body facing surface, a liquid impermeable backsheet at the garment facing surface, and an absorbent core assembly comprising at least one absorbent core arranged between said topsheet and said backsheet said disposable absorbent hygiene product further comprises a pair of side portions extending on each side of the first end portion in said transversal direction to fasten the disposable absorbent hygiene product to the waist of a wearer; said disposable absorbent hygiene product comprises at least one fastener arranged on at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product to fasten the disposable absorbent hygiene product to the waist of a wearer, said fastener comprises a sheet formed base having generally parallel upper and lower surfaces with said lower surface attached to at least one of said side portions or said second end portion of said disposable absorbent hygiene product, said sheet formed base having a length in the longitudinal direction and a width in the transversal direction and comprises at least one fastening area comprising one or more area of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base, said fastening area is arranged at a distance from one first outer edge of said sheet formed base forming an area free of fastening material on said sheet formed base, said fastener is attached to said disposable absorbent hygiene product in an attachment area which overlaps at least partly with the fastening area, wherein the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion or the second end portion.
2. A disposable absorbent hygiene product according to claim 1, wherein the area free of fastening material has a Bending stiffness being at least 15% greater than the Bending stiffness of the side portion and/or second end portion.
3. A disposable absorbent hygiene product according to claim 1, wherein said Bending stiffness of the area free of fastening material is at least 30 mgf.
4. A disposable absorbent hygiene product according to claim 1, wherein said Bending stiffness of the side according to portion or second end portion is at least 30 mgf.
5. A disposable absorbent hygiene product according to claim 1, wherein the distance is at least 5 mm.
6. A disposable absorbent hygiene product according to claim 1, wherein said fastening area is arranged at said distance from one first outer edge arranged in a first transversal direction away from said longitudinal axis.
7. A disposable absorbent hygiene product according to claim 1, wherein said area free of fastening material has a transversal width being equal to said distance from one first outer edge of said sheet formed base at which the fastening area is arranged.
8. A disposable absorbent hygiene product according to claim 1, wherein said area free of fastening material has a longitudinal length being at least 20 mm.
9. A disposable absorbent hygiene product according to claim 1, wherein said attachment area is arranged at a distance from said outer edge of said side portion or said second end portion, wherein

said distance is no more than 5 mm.
10. A disposable absorbent hygiene product, according to claim 1, wherein said sheet formed base protrudes over an outer edge of said side portion or said second end portion of said disposable absorbent hygiene product.
11. A disposable absorbent hygiene product according to claim 10, wherein said sheet formed base protrudes over said outer edge by a distance being at least 3 mm.
12. A disposable absorbent hygiene product according to claim 1, wherein said sheet formed base is free from fold lines.
13. A disposable absorbent hygiene product according to claim 1, wherein said attachment area extends into the area where the sheet formed base is free of fastening elements.
14. A disposable absorbent hygiene product according to claim 1, wherein said fastener is attached to said disposable absorbent hygiene product in said attachment area by adhesive or welding or heat sealing or a combination thereof.
15. A disposable absorbent hygiene product according to claim 1, wherein said fastening elements are hooks.
16. A disposable absorbent hygiene product according to claim 1, wherein said first end portion is the rear region of the disposable absorbent hygiene product and said second end portion is the front region of the disposable absorbent hygiene product and said central portion is the crotch region.
17. A disposable absorbent hygiene product according to claim 1, wherein said disposable absorbent hygiene product is a belt product and said side portions are first and second belt portions for securing to each other around a waist of a wearer of the product to form a belt having an exterior surface, wherein the first belt portion has a free end which carries said fastener adapted to be attached to an exterior surface of the other of the belt portions.
18. A disposable absorbent hygiene product according to claim 1, wherein said disposable absorbent hygiene product is a belt product and said side portions are first and second belt portions for securing to each other around a waist of a wearer of the product to form a belt having an exterior surface, wherein the first belt portion is adapted to be attached to an exterior surface of the other of the belt portions, and wherein said second end portion of the chassis comprises said fastener for securing the second end portion of the chassis to the belt portions so that said product assumes pant shape with the belt portions forming a part of a waist portion of the pant.
19. A disposable absorbent hygiene product according to claim 1, wherein said side portions are side panels each comprising said fastener and connecting the first and second end portions to one another, when the product is being worn, said fasteners are adapted to be attached to a contact region on the second end portion.
20. A disposable absorbent hygiene product according to claim 1, wherein said disposable absorbent hygiene product comprises a second pair of side portions extending on each side of the second end portion in said transversal direction and wherein said side portions on said first end portion are side panels each comprising said fastener and connecting the first and second end portions to one another, when the product is being worn, said fasteners are adapted to be attached to a contact region on respective side portion of said second pair of side portions.
21. A disposable absorbent hygiene product according to claim 20, wherein said fastener is arranged in said second end portion of said disposable absorbent hygiene product where said topsheet and said backsheet are attached together at a bonding area, said bonding area overlapping at least partly said attachment area and extending outside said attachment area at least in said first transversal direction.
22. A disposable absorbent hygiene product comprising a chassis having first and second end portions and a central portion extending therebetween, said chassis having a body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer, a longitudinal axis extending in a longitudinal direction and defining a longitudinal direction from said first end portion towards said second end portion and a transversal

axis defining a transversal direction perpendicular to the longitudinal direction, the chassis comprising a liquid permeable topsheet at the body facing surface, a liquid impermeable backsheet at the garment facing surface, and an absorbent core assembly comprising at least one absorbent core arranged between said topsheet and said backsheet; said disposable absorbent hygiene product further comprises a pair of side portions extending on each side of the first end portion in said transversal direction to fasten the disposable absorbent hygiene product to the waist of a wearer; said disposable absorbent hygiene product comprises at least one fastener arranged on at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product to fasten the disposable absorbent hygiene product to the waist of a wearer, said fastener comprises a sheet formed base having generally parallel upper and lower surfaces with said lower surface attached to at least one of said side portions or said second end portion of said disposable absorbent hygiene product, said sheet formed base having a length in the longitudinal direction and a width in the transversal direction and comprises at least one fastening area comprising one or more area of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base, wherein said fastening area is arranged at a distance from one first outer edge of said sheet formed base forming an area free of fastening material on said sheet formed base, said fastener is attached to said disposable absorbent hygiene product in an attachment area which overlaps at least partly with the fastening area, wherein said distance is at least 5 mm, and wherein said area free of fastening material has an extension in a direction perpendicular to said distance being at least 20 mm.

23. A disposable absorbent hygiene product according to claim 22, wherein said fastening area is arranged at said distance from said first outer edge of the sheet formed base arranged in a first transversal direction away from said longitudinal axis.

24. A disposable absorbent hygiene product according to claim 22, wherein said area free of fastening material has a transversal width being equal to said distance, and said extension in a direction perpendicular to the distance is a longitudinal length.

25. A disposable absorbent hygiene product according to claim 22, wherein the area free of fastening material has a Bending stiffness greater than the Bending stiffness of the side portion or second end portion.

26. A disposable absorbent hygiene product comprising a chassis having first and second end portions and a central portion extending therebetween, said chassis having a body facing surface intended to face the body of a wearer and a garment facing surface intended to face away from the body of a wearer, a longitudinal axis extending in a longitudinal direction and defining a longitudinal direction from said first end portion towards said second end portion and a transversal axis defining a transversal direction perpendicular to the longitudinal direction, the chassis comprising a liquid permeable topsheet at the body facing surface, a liquid impermeable backsheet at the garment facing surface, and an absorbent core assembly comprising at least one absorbent core arranged between said topsheet and said backsheet; said disposable absorbent hygiene product further comprises a pair of side portions extending on each side of the first end portion in said transversal direction to fasten the disposable absorbent hygiene product to the waist of a wearer; said disposable absorbent hygiene product comprises at least one fastener arranged on at least one of said side portions and/or said second end portion of said disposable absorbent hygiene product to fasten the disposable absorbent hygiene product to the waist of a wearer, said fastener comprises a sheet formed base having generally parallel upper and lower surfaces with said lower surface attached to at least one of said side portions or said second end portion of said disposable absorbent hygiene product, said sheet formed base having a length in the longitudinal direction and a width in the transversal direction and comprises at least one fastening area comprising one or more area of a fastening material comprising a plurality of discrete fastening elements comprising stems which project from the upper surface of said sheet formed base, wherein said fastening area is arranged at a distance from one first outer edge of said sheet formed base forming an area free of fastening

material on said sheet formed base, said fastener is attached to said disposable absorbent hygiene product in an attachment area which overlaps at least partly with the fastening area, wherein said distance is at least 5 mm, and wherein said area free of fastening material has an extension in a direction perpendicular to said distance being at least 20 mm; and the area free of fastening material has a Bending stiffness being at least 15% greater than the Bending stiffness of the side portion.