

Patent Owner's Demonstratives

Attends Healthcare Products, Inc.

v.

Paul HARTMANN AG

IPR2020-01477 (Patent 8,152,788 B2)

IPR2020-01478 (Patent 8,784,398 B2)

IPR2020-01479 (Patent 8,771,249 B2)

IPR2020-01480 (Patent 8,708,990 B2)

December 2, 2021

Diaper and Nonwovens Background

97. In general, there are three common type of diapers—conventional diapers, T-shaped or belt diapers, and pull up diapers. These different types of diapers operate differently when donning the article on the wearer and attaching fasteners to secure the diaper on the wearer. A T-shaped or belt diaper typically has

Ex. 2004 (Butterworth Dec.), ¶ 97 (annotated).

Diaper and Nonwovens Background

97. In general, there are three common type of diapers—conventional diapers, T-shaped or belt diapers, and pull up diapers. These different types of diapers operate differently when donning the article on the wearer and attaching fasteners to secure the diaper on the wearer. A T-shaped or belt diaper typically has two wings that are fastened together to form a belt. Generally, once the belt of the T-shaped diaper is secured around the body, the front portion of the diaper is brought up and fastened to that belt. Because all of the fasteners engage the wings that form the belt, the belt carries all of the weight of the diaper. A T-shaped diaper is shown in Karami '626 (Ex. 1004), Karami '772 (Ex. 1003), and Stupperich (Ex. 1009). Stupperich's Figure 1, which is annotated below, shows the belt 10 (orange):

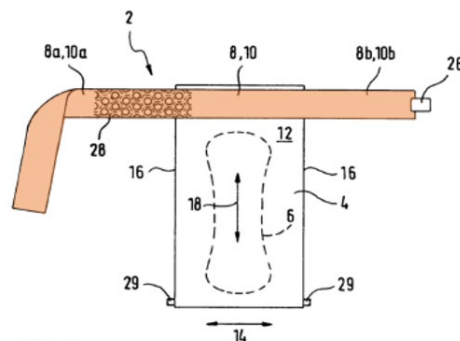
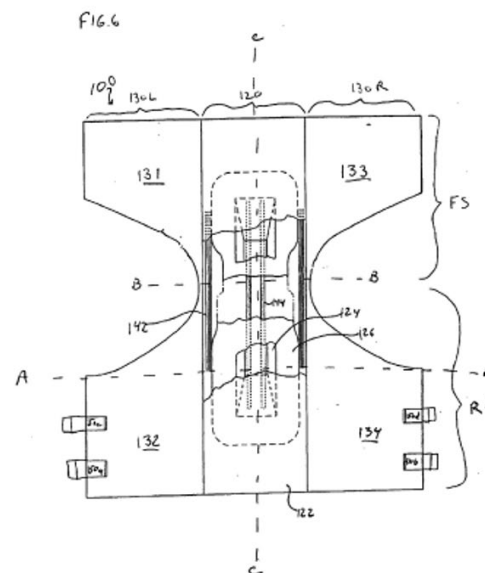


Fig. 1

Ex. 2004 (Butterworth Dec.), ¶ 97 (annotated).

Diaper and Nonwovens Background

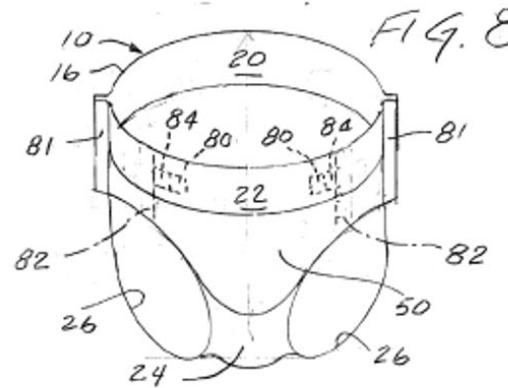
A conventional diaper typically has some contouring around the legs, although some such as shown in Benning (Ex. 1002), are rectangular with four side portions. The fasteners may be located at the front or back part of the diaper. Unlike the T-shaped diaper, there is no belt that carries the entire weight of the diaper; instead, the side portions and front of the diaper carry the weight of the diaper. A conventional diaper is shown in Karami '772 Figure 6, reproduced below.



Ex. 2004 (Butterworth Dec.), ¶ 97 (annotated).

Diaper and Nonwovens Background

A pull-up diaper is one that is intended to be put on similar to underpants where the diaper can be pulled up as one unit. The side seams may be permanent or pre-fastened with re-closeable fasteners. Pull-up diapers may be adjusted to fit with fasteners at each side. A pull-up diaper is illustrated in Figure 8 of Karami '626 (Ex. 1004), reproduced below:



Ex. 2004 (Butterworth Dec.), ¶ 97 (annotated).

Diaper and Nonwovens Background

98. When a person of ordinary skill in the art designs an incontinence diaper, they must consider their design objectives at the start, including the type of diaper. These objectives will drive the materials selected and the manufacturing processes used. A skilled artisan would not rely solely on the basis weight of the nonwoven when designing an incontinence diaper. Nonwovens are greatly impacted by fiber properties (e.g., fiber type, density, crimp, and wetting), by fabric construction (e.g., interlacing, bonding method, fiber orientation, and chemical finishing), and by mechanical finishing (e.g., permeability, wicking, liquid run-off, bulk, strike-through, and wetness barrier). And a skilled artisan would consider all of these properties before specifying a nonwoven for an incontinence product component. In addition to these considerations, a person of ordinary skill in the art would consider how manufacturing would be impacted by the nonwoven fabric's properties. For example, a skilled artisan would know that,

Ex. 2004 (Butterworth Dec.), ¶ 98 (annotated).

Diaper and Nonwovens Background

103. For a nonwoven, the method and conditions by which the nonwoven fabric has been made, the inclusion or removal of materials from the fibers, and finishing (mechanical, thermal, chemical) employed are very significant. Fiber material (typically a polyolefin such as polypropylene and polyester), fiber cross-sectional shape and crimping, diameter and finish all impact fiber, and hence, fabric behavior. If the fibers are too fine, they will inhibit penetration of the mechanical "hooks" and those that do snag fibers will find they do not have adequate load bearing capability. If the fibers are too coarse, then then they will not engage properly with the parts of the mechanical closure. Further, at the finishing state of nonwoven products, factors such as thickness, consolidation by point bonding, thermal stabilization, and bonding density and pattern, all impact subsequent performance as a closure surface. Once formed as a nonwoven, the fiber segments available to be snagged by mechanical closure parts must be engineered in such a way that the connected fastener can perform in a refastenable manner. Usually, the nonwoven works in conjunction with a film or other substrate

Ex. 2004 (Butterworth Dec.), ¶ 103 (annotated).

Diaper and Nonwovens Background

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1 could affect how well it engages a fastener,
2 correct?
3 A. Possibly. Yes.
4 Q. Well, Karami '626 says the pore size
5 affects the peel strength, correct?
6 A. Yes, it can. They mention that it had an
7 impact on peel strength, which is not that
8 significant on the overall attribute of the
9 diaper, which is what I said before.
10 Q. And could you engineer a diaper using an
11 embossing pattern to either enhance or detract how
12 well the non-woven engages the fastener?
13 A. If you look at Stupperich, that's what
14 they tried to do. If you look at Kimberly-Clark,
15 they **modified the emboss pattern** -- not to change
16 the pore size, however. They just basically
17 change the presentation of the fibers to the -- to
18 the hook.
19 Q. Okay. And in that way, they were able to
20 get better engagement with the fibers to the hook?
21 A. By modifications, yes. **That's one of the**
22 **variables that you can use.**

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215-241-1000 ~ 610-434-8588 ~ 302-571-0510 ~ 202-803-8830

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1 **Q. What are some of the other variables you**
2 **could use if you are engineering the non-woven to**
3 **engage fasteners better?**
4 A. Well, you know, I'm just going to cite
5 the Beckert '788 and some other claims that
6 they're using known techniques for post-treating,
7 such as **heat setting**, you know, **ring rolling**.
8 There are a couple of ways of **corrugating** the
9 non-wovens, some through not heat setting
10 necessarily -- you get the same effect -- but
11 through elasticity of one of the components.
12 Those would be ways to do that.
13 You could look at it through Gorman where
14 they basically **form the loops mechanically and**
15 **then adhere them to a backing sheet**. So those
16 techniques have been used.
17 Q. And I think we also discussed in
18 connection with Damaghi and the stay-away zone,
19 **you can engineer to be less receptive or to not**
20 **adhere to a fastener, correct?**
21 **A. If I emboss the heck out of it and make a**
22 **film out of the non-woven, it would not have any**

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1 **affinity to hooks, or very little affinity.** So,
2 you know, there are known techniques. But the key
3 material is these materials that we're discussing
4 overall, except the ones that are dedicated, like
5 the 3M material, et cetera, are not conventional
6 non-wovens. I mean, they basically are telling us
7 that this is a conventional material that is sold
8 throughout, you know.
9 Q. I'd like to just -- since I mentioned the
10 Damaghi and the stay-away zone, I'd like to turn
11 back to the '772 patent, Karami '772.
12 A. Okay.
13 Q. And when we talk about the stay-away
14 zone, and particularly the version where the
15 stay-away zone is formed by having an untreated
16 non-woven in the front -- you're familiar with
17 that stay-away zone?
18 A. Conventional non-woven. Yes.
19 Q. And -- can you tell from Karami '772
20 whether fasteners would adhere to that?
21 A. Whether what?
22 Q. Whether fasteners would engage --

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Ex. 2003 (Jezzi Dep.), 170:10-172:1 (annotated).

Diaper and Nonwovens Background

Q. And so, the use of the non-woven is unconventional, if I understand you correctly?

A. No. He's talking about spunbonds, and we're hung up with the word conventional. There really is nothing like -- there is no such animal as a

conventional non-woven. All non-wovens are different.

And in this case, like others, there are non-wovens that you can buy that will engage with a hook-type fastener, and there are a lot of non-wovens that are made that will not engage with a hook-type fastener. And even if they do engage with a hook-type fastener, it may not be the range or minimum level that is required to form a closure.

Ex. 1054 (Butterworth Dep.), 59:23-60:8 (annotated).

103. For a nonwoven, the method and conditions by which the nonwoven fabric has been made, the inclusion or removal of materials from the fibers, and finishing (mechanical, thermal, chemical) employed are very significant. Fiber material (typically a polyolefin such as polypropylene and polyester), fiber cross-sectional shape and crimping, diameter and finish all impact fiber, and hence, fabric behavior. If the fibers are too fine, they will inhibit penetration of the mechanical "hooks" and those that do snag fibers will find they do not have adequate load bearing capability. If the fibers are too coarse, then then they will not engage properly with the parts of the mechanical closure. Further, at the finishing state of nonwoven products, factors such as thickness, consolidation by point bonding, thermal stabilization, and bonding density and pattern, all impact subsequent performance as a closure surface. Once formed as a nonwoven, the fiber segments available to be snagged by mechanical closure parts must be engineered in such a way that the connected fastener can perform in a refastenable manner. Usually, the nonwoven works in conjunction with a film or other substrate attached by lamination specifically designed to meet the barrier and refastenable requirements of the product in use. It should be emphasized that the steps taken to create a suitable refastenable component are quite specific to each end use, be it a disposable diaper, a T-shaped diaper, an incontinence training pant, or a larger incontinence management product intended for bedridden patients.

Ex. 2004 (Butterworth Dec.), ¶ 103 (annotated).

'398 Patent: Exemplary Claim Language

1. An absorbent incontinence diaper, comprising:
a chassis having an inner face which, when in use, is directed toward a user body and an outer face which, when in use, is directed away from the user body, wherein an entire area of said outer face of said chassis is constituted by a first nonwoven material, said chassis having an absorption body and a backsheet on a side of said absorption body which, when in use, is directed away from the user body, said absorption body having a smaller width than said backsheet, said chassis also having a rear area, a front area and a crotch area lying between said rear area and said front area, said chassis further defining first and second side edges;
four discrete, not directly connected side parts, each of said side parts having an inner face and an outer face, each of said side parts joined to one of said first and said second side edges, with a side part being attached to a side edge on each side of said front area and a side part being attached to a side edge on each side of said rear area;
closure means having mechanical closure aids, said closure means connected to said side parts at said rear area, said closure means configured for selective detachable fastening to said outer face of said chassis and to said outer face of said side parts in said front area, wherein retaining forces between said closure means and said outer face of said chassis secure said diaper on the user body, when in use, and are lower than retaining forces between said closure means and said outer face of said side parts in said front area; and said entire area of said outer face excludes mechanical closures other than said first nonwoven material when not fastened to said closure means.

Ex. 1001 ('398 patent), claim 1 (annotated).

'249 Patent: Exemplary Claim Language

1. An absorbent incontinence diaper for an adult user, comprising:

a chassis having an inner face which, when in use, is directed toward a user body and an outer face which, when in use, is directed away from the user body, said chassis having an absorbent body and a backsheet on a side of said absorbent body which, when in use, is directed away from the user body, said absorbent body having a smaller width than said backsheet, said chassis also having a rear area, a front area, and a crotch area lying between said rear area and said front area, said chassis further defining first and second side edges;

a first ear attached as a separate component to said first side edge in said front area;

a second ear attached as a separate component to said second edge in said front area;

a third ear attached as a separate component to said first side edge in said rear area;

a fourth ear attached as a separate component to said second side edge in said rear area;

said third and fourth ears having a closure component including mechanical closure aids which, when in use, hold the diaper on the user body when said closure component is selectively fastened to either said outer face of said chassis or to said outer face of said first and second ears;

wherein retaining forces between said closure component and said outer face of said chassis are lower than retaining forces between said closure component and said outer face of said first and second ears.

Ex. 1001 ('249 patent), claim 1 (annotated).

'990 Patent: Exemplary Claim Language

1. An absorbent incontinence diaper for use on an adult user, comprising:

a chassis comprising a liquid-permeable topsheet which, when in use on said adult user, is directed toward a user body and a liquid impermeable backsheet which, when in use on said adult user, is directed away from the user body, the backsheet having an outer face comprising a first nonwoven material having a first mass per unit area and having a first thickness;

said chassis having:

a front area which, when in use on said adult user, is located on a front of said adult user, said front area including a first front side and a second front side,

a rear area which, when in use on said adult user, is located on a rear of said adult user, said rear area including a first rear side and a second rear side, and a crotch area located between the front area and the rear area;

an absorbent body disposed between said liquid-permeable topsheet and said liquid impermeable backsheet;

a pair of rear side parts, comprising

a first discrete side part joined at said first rear side of said chassis, and

a second discrete side part joined at said second rear side of said chassis;

a pair of front side parts, comprising

a third discrete side part joined at said first front side of said chassis, and having an outer face comprising a second nonwoven material, and

a fourth discrete side part joined at said second front side of said chassis, and having an outer face comprising said second nonwoven material;

said second nonwoven material has a second mass per unit area that is greater than said first mass per unit area of said first nonwoven material and has a second thickness which is greater than said first thickness of said first nonwoven material under a pressure of 0.5 kPa;

a first closure aid, comprising a first mechanical closure aid, connected to said first discrete side part; said first closure aid configured for selective detachable fastening to said outer face of said backsheet and to said outer face of said third discrete side part;

a second closure aid, comprising a second mechanical closure aid, connected to said second discrete side part; said second closure aid configured for selective detachable fastening to said outer face of said backsheet and to said outer face of said fourth discrete side part;

wherein a retaining force between said first closure aid and said outer face of said backsheet when in use permits retention of said first closure aid for securing said diaper to said adult user and is lower than a retaining force between said first closure aid and said outer face of said third discrete side part; and

wherein a retaining force between said second closure aid and said outer face of said backsheet when in use permits retention of said second closure aid for securing said diaper to said adult user and is lower than a retaining force between said second closure aid and said outer face of said fourth discrete side part.

Ex. 1001 ('990 patent), claim 1 (annotated).

'788 Patent: Exemplary Claim Language

1. An absorbent incontinence diaper comprising:
a main part having an inner face directed toward a user body and an outer face directed away from the user body, said main part having an absorption body and a backsheet on a side of said absorption body directed away from the user body, said absorption body having a smaller width than said backsheet, said main part also having a rear area, a front area and a crotch area lying between said rear area and said front area, said main part further defining first and second side edges;
side parts joined to said first and said second side edges, said side parts having an inner face and an outer face; and
mechanical closure means having mechanical closure aids, said closure means cooperating with said side parts at said rear area, said closure means being structured and dimensioned for detachable fastening to said outer face of said main part and to said outer face of said side parts in said front area, wherein retaining forces between said mechanical closure means and said outer face of said main part are lower than retaining forces between said mechanical closure means and said outer face of said side parts in said front area, wherein said side parts in said front and/or said rear area are folded upon themselves at least about one folding line extending in a longitudinal direction.

Ex. 1001 ('788 patent), claim 1 (annotated).

'398 Patent Features

SUMMARY OF THE INVENTION

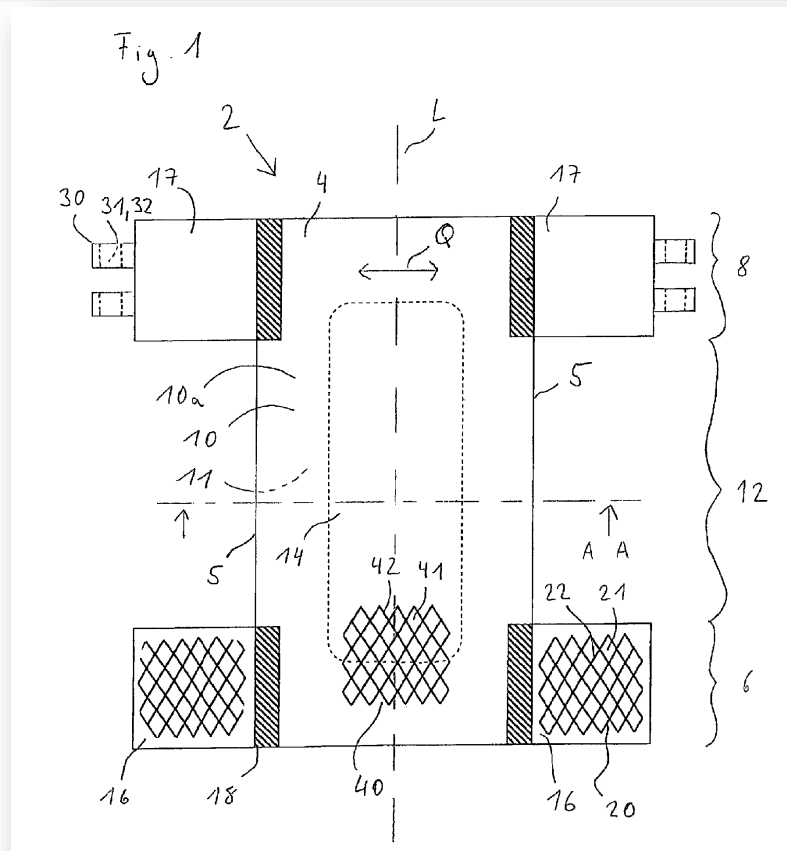
To solve these problems, it is suggested that the closure means having mechanical closure aids can, to correctly secure the diaper on the body of a user, be secured detachably at least in regions both on the outer face of the main part and also on the outer face of the side parts in the front area, the retaining forces between the mechanical closure means and the outer face of the main part being lower than the retaining forces between the mechanical closure means and the outer face of the side parts in the front area. The retaining forces are preferably determined as over-abdomen retaining forces.

The materials forming the outer face of the main part and the outer face of the side parts in the front area are inventively chosen so that, in addition to their primary function, they can also serve as the engagement surface for the closure means having mechanical closure aids. Surprisingly it has also been shown that, when the retaining forces between the closure means and the outer face of the main part are smaller than the retaining forces between the closure means and the outer face of the side parts in the front area of the diaper, the users of the diapers tend to close the diaper in such a way that the closure means are secured on the outer face of the side parts in the front area. This, in turn, increases the wearing comfort of the diaper because it avoids overlapping of the side parts with the backsheet, which enables the advantages of the permeability to air and water vapor of the side parts to take effect without obstruction. Moreover, the risk of damage to the backsheet of the main part and therefore the risk of liquid passing through the mechanical closure aids is reduced.

The essential characteristic is that the retaining forces between the outer face of the main part and the closure means having mechanical closure aids also help to hold the diaper on the body. For this purpose, it has proven advantageous if the over-abdomen retaining forces between the closure means and the outer face of the main part is 57-20 N/25 mm and, in particular, 50-25 N/25 mm.

Ex. 1001 ('398 patent), 2:7-41 (annotated).

'398 Patent Exemplary Diaper



Ex. 1001 ('398 patent), Fig. 1.

'788 Patent Features

SUMMARY OF THE INVENTION

To solve these problems, it is suggested that the closure means having mechanical closure aids can, to correctly secure the diaper on the body of a user, be secured detachably at least in regions both on the outer face of the main part and also on the outer face of the side parts in the front area, the retaining forces between the mechanical closure means and the outer face of the main part being lower than the retaining forces between the mechanical closure means and the outer face of the side parts in the front area. The retaining forces are preferably determined as over-abdomen retaining forces.

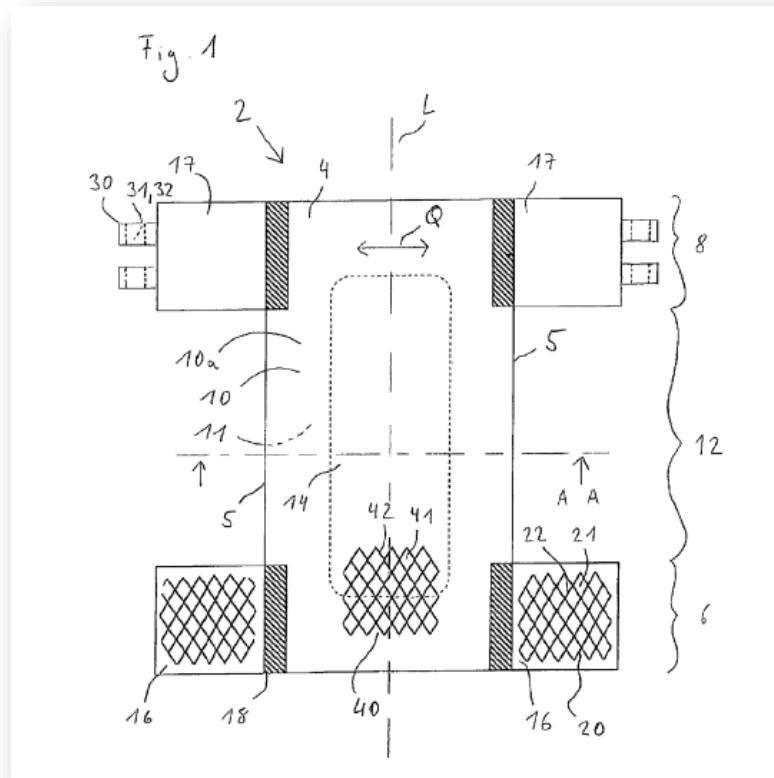
The materials forming the outer face of the main part and the outer face of the side parts in the front area are inventively chosen so that, in addition to their primary function, they can also serve as the engagement surface for the closure means having mechanical closure aids. Surprisingly it has also been shown that, when the retaining forces between the closure means and the outer face of the main part are smaller than the retaining forces between the closure means and the outer face of the side parts in the front area of the diaper, the users of the diapers tend to close the diaper in such a way that the closure means are secured on the outer face of the side parts in the front area. This, in turn, increases the wearing comfort of the

diaper because it avoids overlapping of the side parts with the backsheet, which enables the advantages of the permeability to air and water vapor of the side parts to take effect without obstruction. Moreover, the risk of damage to the backsheet of the main part and therefore the risk of liquid passing through the mechanical closure aids is reduced.

The essential characteristic is that the retaining forces between the outer face of the main part and the closure means having mechanical closure aids also help to hold the diaper on the body. For this purpose, it has proven advantageous if the over-abdomen retaining forces between the closure means and the outer face of the main part is 57-20 N/25 mm and, in particular, 50-25 N/25 mm.

Ex. 1001 ('788 patent), 1:64-2:33 (annotated).

'788 Patent Exemplary Diaper



Ex. 1001 ('788 patent), Fig. 1.

Petitioner Now Calls Claim Requirement “Necessarily Broad”

I. PO’S DIAPER-HOLDING REQUIREMENT IS BROAD

PO contends that claims 1, 26, 28, and 30 require “both [closure-chassis and closure-side parts] retaining forces be sufficient to secure the diaper on a wearer” (the “Diaper-Holding Requirement”). POR at 9-10. But the Diaper-Holding Requirement is necessarily broad. See EX1054 at 13:19:14:1, 14:25-16:12 (including when the diaper “popped off”). PO cannot hope to argue that the Benning-Karami ’626 diaper, which is founded on size-adjustability (*infra* Section III.A), might have fallen short. Nor can PO fault the Karami ’772-Benning diaper given a POSITA’s knowledge that the untreated nonwoven in Karami ’772’s stay-away zone was more than capable of sufficiently engaging a fastener (*infra* Section II.A).

Paper 12 (Petition), 40 (annotated).

Petitioner Acknowledged Lower Retaining Forces Must Hold/Secure Diaper

are asserted here. EX1043, 347-350/460, 181-186/460. Moreover, specific evidence herein was not substantively considered, including Karami '772's (EX1003's) explicit teaching of claim 1's variable retaining forces sufficient to hold a diaper on a wearer (§VIII.A.2, Limitation 1[c][4]) and evidence showing the desirability of differential basis weights that would have produced such variable retaining forces (§VIII.B.2, Limitation 1[c][4]).

Paper 12 (Petition), 3 (annotated).

... [, but t]his practice is wasteful"); EX1012, ¶¶77, 97. Such affinity was sufficient to permit the fasteners' use on the stay-away zone to secure the diaper on a wearer,

Paper 12 (Petition), 41 (annotated).

Even in stay-away zone 160, retaining forces between fasteners 150a-150d and backsheet 130 were sufficient to hold the diaper on a wearer. EX1012, ¶¶68-70, 75. Karami '772's backsheet—like Karami '626's—is a film-nonwoven

Paper 12 (Petition), 32 (annotated).

150a-150d thereto. EX1012, ¶¶77, 97. POSITA would have also understood that such discouragement, however, did not prevent such attachment because the stay-away zone has affinity for the fasteners, and that affinity is sufficient to hold the diaper on a wearer. §VIII.A.2, Limitation 1[c][4]; EX1012, ¶¶69-70, 75.

Paper 12 (Petition), 40 (annotated).

Petitioner Acknowledged Lower Retaining Forces Must Hold/Secure Diaper

EX1043, 60-63/258. Moreover, specific evidence herein was not substantively considered, including Karami '772's (EX1003's) explicit teaching of claim 1's variable retaining forces sufficient to hold a diaper on a wearer (§VIII.A.2, Paper 12 (Petition), 2 (annotated).

... [, but t]his practice is wasteful"); EX1012, ¶¶77, 97. Such affinity was sufficient to permit the fasteners' use on the stay-away zone to secure the diaper on a wearer, Paper 12 (Petition), 44 (annotated).

Even in stay-away zone 160, retaining forces between fasteners 150a-150d and backsheet 130 were sufficient to hold the diaper on a wearer. EX1012, ¶¶68-70, 75. Karami '772's backsheet—like Karami '626's—is a film-nonwoven

Paper 12 (Petition), 36 (annotated).

150a-150d thereto. EX1012, ¶¶77,97. POSITA would have also understood that such discouragement, however, did not prevent such attachment because the stay-away zone has affinity for the fasteners, and that affinity is sufficient to hold the diaper on a wearer. §VIII.A.2, Limitation 1[c][4]; EX1012, ¶¶69-70, 75.

Paper 12 (Petition), 44 (annotated).

The Beckert Patents Teach and Claim Differing Retentive Forces to Secure Diaper

SUMMARY OF THE INVENTION

To solve these problems, it is suggested that the closure means having mechanical closure aids can, to correctly secure the diaper on the body of a user, be secured detachably at least in regions both on the outer face of the main part and also on the outer face of the side parts in the front area, the retaining forces between the mechanical closure means and the outer face of the main part being lower than the retaining forces between the mechanical closure means and the outer face of the side parts in the front area. The retaining forces are preferably determined as over-abdomen retaining forces.

The materials forming the outer face of the main part and the outer face of the side parts in the front area are inventively chosen so that, in addition to their primary function, they can also serve as the engagement surface for the closure means having mechanical closure aids. Surprisingly it has also been shown that, when the retaining forces between the closure means and the outer face of the main part are smaller than the retaining forces between the closure means and the outer face of the side parts in the front area of the diaper, the users of the diapers tend to close the diaper in such a way that the closure means are secured on the outer face of the side parts in the front area. This, in turn, increases the wearing comfort of the diaper because it avoids overlapping of the side parts with the backsheet, which enables the advantages of the permeability to air and water vapor of the side parts to take effect without obstruction. Moreover, the risk of damage to the backsheet of the main part and therefore the risk of liquid passing through the mechanical closure aids is reduced.

The essential characteristic is that the retaining forces between the outer face of the main part and the closure means having mechanical closure aids also help to hold the diaper on the body. For this purpose, it has proven advantageous if the over-abdomen retaining forces between the closure means and the outer face of the main part is 57-20 N/25 mm and, in particular, 50-25 N/25 mm.

Ex. 1001 ('398 patent), 2:7-41 (annotated).

1. An absorbent incontinence diaper, comprising:

a chassis having an inner face which, when in use, is directed toward a user body and an outer face which, when in use, is directed away from the user body, wherein an entire area of said outer face of said chassis is constituted by a first nonwoven material, said chassis having an absorption body and a backsheet on a side of said absorption body which, when in use, is directed away from the user body, said absorption body having a smaller width than said backsheet, said chassis also having a rear area, a front area and a crotch area lying between said rear area and said front area, said chassis further defining first and second side edges;

four discrete, not directly connected side parts, each of said side parts having an inner face and an outer face, each of said side parts joined to one of said first and said second side edges, with a side part being attached to a side edge on each side of said front area and a side part being attached to a side edge on each side of said rear area;

closure means having mechanical closure aids, said closure means connected to said side parts at said rear area, said closure means configured for selective detachable fastening to said outer face of said chassis and to said outer face of said side parts in said front area, wherein retaining forces between said closure means and said outer face of said chassis secure said diaper on the user body, when in use, and are lower than retaining forces between said closure means and said outer face of said side parts in said front area; and said entire area of said outer face excludes mechanical closures other than said first nonwoven material when not fastened to said closure means.

Ex. 1001 ('398 patent), claim 1 (annotated).

Karami '772

nature of the latter). Thus, conventional woven or nonwoven articles have had affixed to the surface thereof along one axis (e.g., sewn thereon) a miniloop fastener element strip of greater longitudinal dimensions than the corresponding minihook fastener element, thereby to provide the user with freedom of choice as to where the minihook fastener element would be positioned along the miniloop fastener element strip. For example, see U.S. Pat. No. 5,383,872,

Ex. 1003 (Karami '772), [0003] (annotated).

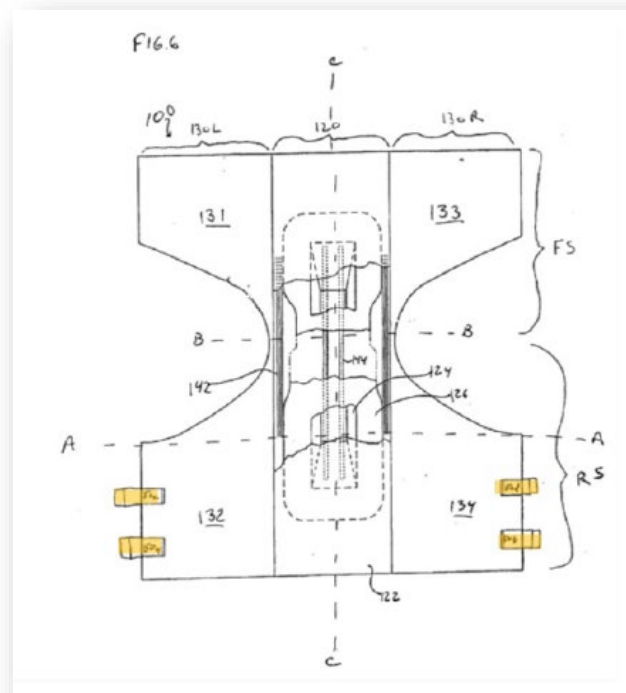
[0025] In various exemplary embodiments of the present invention, an absorbent article is provided with a fastening system that does not include a loop fastening element. Instead, hook-type fasteners are able to securely attach to a bonded nonwoven surface that has been subjected to a water jet treatment and/or aperturing. The nonwoven can also be provided with a pattern of three-dimensional relief structures during the water jet treatment, resulting in even greater shear and peel strength. The absorbent article can be a T-shaped or conventional shaped diaper, a pull-up undergarment, a breathable diaper or any other garment that incorporates a fastening system.

Ex. 1003 (Karami '772), [0025] (annotated).

Karami '772

[0048] At least a portion of the each of the wings **131** and **133** is made of water jet treated and/or apertured nonwoven. The wings **131** and **133** can be water jet treated with or without pillows. In at least one embodiment of the invention, the entire outer surface of the wings **131** and **133** is made of water jet treated and/or apertured nonwoven so that the hook-type fasteners **150a-150d** can securely engage with any portion of the wings **131** and **133** when the diaper **100** is placed on the wearer. Thus, the fastening of the hook-type fasteners **150a-150d** to the front portion of the diaper **100** is not restricted to specific landing zones. As in the wings of the previously-described T-shaped diaper, the wings **131** and **133** of the diaper **100** can be made of any single layer or multi-layer bonded nonwoven, such as, for example, a nonwoven subjected to chemical bonding, thermal bonding or hydroentanglement, that is later subjected to water jet treatment (with or without three-dimensional relief structures) and/or apertured. As discussed with reference to Table 1, a spunbond nonwoven that is water jet treated and/or apertured has a significantly higher peel strength and shear strength in comparison to the conventional bonded nonwoven without any modification.

Ex. 1003 (Karami '772), [0048] (annotated).



Ex. 1003 (Karami '772), Fig. 6 (annotated).

Karami '772

[0042] The degree of overlap in the connection between the wings 40 (to form the belt 44) will vary with the waist size of the wearer. While a large-waisted person may have the hook-type fasteners 46 and 48 contacting respective wings 40, 40, a small-waisted person may have the hook-type fasteners 46 and 48 contacting only a single wing 40 which almost completely overlaps the other wing 40. In a conventional T-shaped brief this would present a problem in suitably locating the loop landing zones (that is, the conventional female fastening elements) along the garment-facing surface of each wing 40 if the brief were to be suitable for use by both large- and small-waisted persons. Water jet treating and/or aperturing the nonwoven wings 40 obviates the need for corresponding loop-type landing zones to mate with the hook-type fasteners 41, 46 and 48. The increased shear and peel strength of the water jet treated and/or apertured bonded nonwoven allows the hook-type fastener 41 at the free end of one of the wings 40 to be securely fastened at any point along the outer surface of the other wing 40 and the hook-type fasteners 46, 48 on the front portion 22 to be securely fastened at any point along the outer surface of either wing 40. Thus, the T-shaped diaper 10 is suitable for both large-waisted and small-waisted wearers.

Ex. 1003 (Karami '772), [0042] (annotated).

[0051] The pull-up absorbent article 200 can be replaced on the wearer by using the hook-type fasteners 250a-250d, as in the conventional diaper product. At least a portion of the each of the wings 231 and 233 at the front section FS of the pull-up type absorbent article 200 is made of water jet treated and/or apertured bonded nonwoven. If water jet treated, the bonded nonwoven can be pillowed. In at least one embodiment of the invention, the entire outer surface of the wings 231 and 233 is made of water jet treated and/or apertured bonded nonwoven so that the hook-type fasteners 250a-250d can securely engage with any portion of the wings 231 and 233 when the pull-up absorbent article 200 is placed on the wearer. Thus, the fastening of the hook-type fasteners 250a-250d to the front portion of the pull-up absorbent article 200 is not restricted to specific landing zones. As in the previously described embodiments of the invention, the wings 231 and 233 of the diaper 200 can be made of any single layer or multi-layer bonded nonwoven, such as, for example, a nonwoven subjected to chemical bonding, thermal bonding or hydroentanglement, that is later subjected to water jet treatment and/or apertured. As discussed with reference to Table 1, a spunbond nonwoven that is water jet treated and/or apertured has a significantly higher peel strength and shear strength in comparison to the conventional bonded nonwoven without any modification.

Ex. 1003 (Karami '772), [0051] (annotated).

Karami '772

[0048] At least a portion of the each of the wings 131 and 133 is made of water jet treated and/or apertured nonwoven. The wings 131 and 133 can be water jet treated with or without pillows. In at least one embodiment of the invention, the entire outer surface of the wings 131 and 133 is made of water jet treated and/or apertured nonwoven so that the hook-type fasteners 150a-150d can securely engage with any portion of the wings 131 and 133 when the diaper 100 is placed on the wearer. Thus, the fastening of the hook-type fasteners 150a-150d to the front portion of the diaper 100 is not restricted to specific landing zones. As in the wings of the previously-described T-shaped diaper, the wings 131 and 133 of the diaper 100 can be made of any single layer or multi-layer bonded nonwoven, such as, for example, a nonwoven subjected to chemical bonding, thermal bonding or hydroentanglement, that is later subjected to water jet treatment (with or without three-dimensional relief structures) and/or apertured. As discussed with reference to Table 1, a spunbond nonwoven that is water jet treated and/or apertured has a significantly higher peel strength and shear strength in comparison to the conventional bonded nonwoven without any modification.

Ex. 1003 (Karami '772), [0048] (annotated).

Karami '772

[0040] Example 1 below illustrates the advantages provided by the inventive concept of water jet treating and/or aperturing a bonded nonwoven to enhance shear and peel strengths of a fastening system.

Ex. 1003 (Karami '772), [0040] (annotated).

[0044] The T-shaped diaper 10 described in the previous embodiments is used to illustrate the inventive concept of using a water jet treated and/or apertured bonded nonwoven as part of an absorbent article to enhance the shear and peel strength of surfaces of the absorbent article that engage with a hook-type fastener. It should be appreciated by those skilled in the art that a bonded nonwoven subjected to water jet treatment and/or aperturing treatment is applicable to any other type of absorbent article that has a fastening system, such as conventional diapers and pull-up type absorbent articles.

Ex. 1003 (Karami '772), [0044] (annotated).

[0052] It should be appreciated that the structures of the diaper, whether conventional or T-shaped, and the pull-up type absorbent article provided herein are merely exemplary, and the present invention is meant to encompass absorbent articles having any other suitable structure that incorporates the inventive concept of a bonded nonwoven that is water jet treated and/or apertured to enhance shear and peel strength of a fastening system. For example, it should be appreciated that the backsheet may be formed of the above-identified nonwoven layered with a polypropylene or polyethylene film or as a laminate or like composite of a plurality of nonwovens.

Ex. 1003 (Karami '772), [0052] (annotated).

Karami '772

[0041] The shear and peel strengths of various hook-type fastener samples were measured using a modified version of the ASTM standardized testing procedures. The shear and peel strengths of hook-type fastener samples provided by Binder GmbH of Germany and Velcro of Manchester, N.H. were measured in relation to 33.9 gsm spunbond nonwoven, the same nonwoven subjected to aperturing with 16 pins/sq. in., and the same nonwoven subjected to aperturing with 32 pins/sq. in. Testing was also done with 20 gsm nonwoven subjected to water jet treatment, and the same nonwoven subjected to both water jet treatment and aperturing with 16 pins/sq. in. As shown in Table 1, which summarizes the experimental results, a spunbond nonwoven that is subjected to water jet treatment and/or apertured has a significantly higher peel strength and shear strength in comparison to the conventional spunbond nonwoven without any of the modifications. For example, as shown for the Binder 25445 hook sample, a spunbond nonwoven having perforations formed using a pin roller with 16 pins/sq. in. has a significantly higher peel strength and shear strength compared to the same spunbond nonwoven without any modifications. Increasing the number of pins to 32 pin/sq. in. increases the peel and shear strength of the nonwoven even further. Similarly, subjecting the spunbond nonwoven to water jet treatment significantly increases the peel and shear strength, and combining water jet treatment with perforations results in the most dramatic improvement in peel and shear strength.

Ex. 1003 (Karami '772), [0041] (annotated).

TABLE 1

Hook Peel and Shear Strength Comparison 2" long x 1" wide Hook Samples (In a tape tab + finger lift)							
Binder 25445 (TAPE52) Hook Samples					Binder 65445 Hook Samples		
FQN 33.9 gsm Spunbond Nonwoven	FQN 33.9 gsm Spunbond Nonwoven- about 16 pins/sq in	FQN 33.9 gsm Spunbond Nonwoven- about 32 pins/sq in	FQN 20 gsm Spunbond/ Water Jet Treated Nonwoven	FQN 20 gsm Spunbond/ Water Jet Treated Nonwoven- about 16 pins/sq in	FQN 33.9 gsm Spunbond Nonwoven	FQN 33.9 gsm Spunbond Nonwoven- about 16 pins/sq in	
1st Peel Strength							
Load at Max Load (g/2 in)	142.628/ 25.7	298.389/ 25.2	443.046/ 85.3	532.557/ 96.8	613.135/ 83.8	78.026/ 56.1	292.842/ 52.1
Shear Strength							
Load at Max Load (g/2 in)	1094.645/ 569.7	2924.343/ 298.9	3325.295/ 420.2	993.601/ 115.5	1686.611/ 303.2	1616.699/ 586.9	2709.794/ 462.9
Binder 65445 Hook Samples				Velcro USA Hook Samples			
FQN 20 gsm Spunbond/ Water Jet Treated Nonwoven	FQN 20 gsm Spunbond/ Wet Jet Treated Nonwoven- about 16 pins/sq in	FQN 33.9 gsm Spunbond Nonwoven	FQN 33.9 gsm Spunbond Nonwoven- about 16 pins/sq in	FQN 20 gsm Spunbond/ Water Jet Treated Nonwoven	FQN 20 gsm Spunbond/ Water Jet Treated- about 16 pins/sq in	FQN 20 gsm Spunbond/ Water Jet Treated- about 16 pins/sq in	
1st Peel Strength							
Load at Max Load (g/2 in)	231.120/ 114.4	530.477/ 77.2	104.840/ 60.1	262.006/ 52.2	446.605/ 55.9	673.645/ 131.3	
Shear Strength							
Load at Max Load (g/2 in)	1516.114/ 256.1	1677.780/ 640.3	203.931/ 132.5	1942.152/ 613.1	1032.605/ 132.6	2311.901/ 72.1	

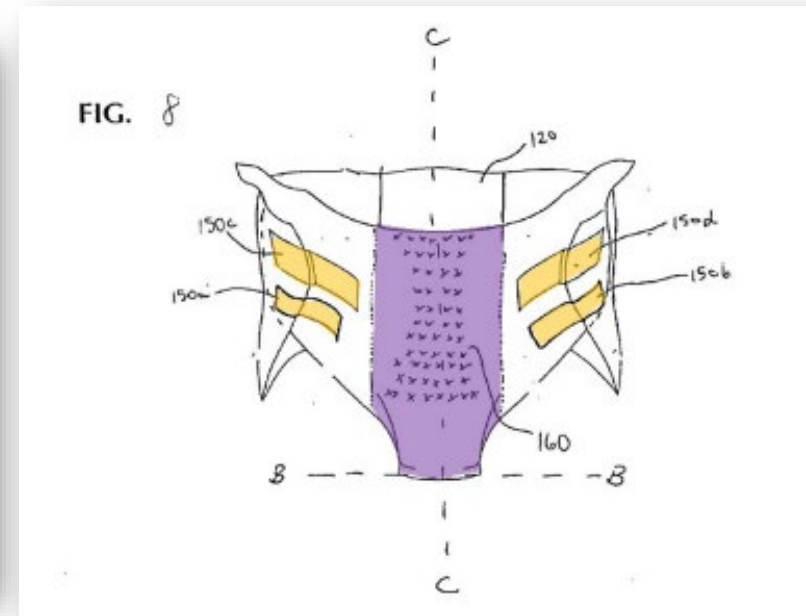
NOTES: All above testing was done peeling and shearing from the 2 inch length side of the hook samples.

Ex. 2004 (Butterworth Dec.), 34 (citing Ex. 1003, Table 1).

Karami '772

[0053] In another exemplary embodiment, as shown in FIG. 8, the diaper 100 can be provided with at least one stay-away zone 160 at the front waist portion. The stay-away zone 160 can be formed by, for example, an inner backing film or backing film laminated to a spunbond/melt blown/spunbond nonwoven exposed through an opening in the backsheet 130. Alternatively, the entire front waist portion can be water jet treated (with or without three-dimensional relief structures) and/or apertured except for a portion of the front waist portion that forms the stay-away zone 160. Thus, the stay away zone without water jet treatment and/or aperturing will have diminished affinity to hook-type fasteners in relation to the remainder of the front waist portion.

Ex. 1003 (Karami '772), [0048] (annotated).



Ex. 1003 (Karami '772), Fig. 8 (annotated).

Petitioner Disclaims Inherency

PO first notes that Karami '772's backsheet nonwoven basis weight range (5-45 gsm (EX1003 at ¶ [0031])) overlaps but extends below Karami '626's (13-50 gsm (EX1004 at ¶ [0065])). POR at 29. And PO contends it wins under alleged strictures of inherency because Karami '772's range includes a 5-gsm-nonwoven backsheet that might not meet the Diaper-Holding Requirement. *Id.* But PO's argument is a strawman because these grounds are based on Karami '772's disclosed 10-30-gsm-nonwoven backsheet—not the 5-gsm-nonwoven backsheet—and specifically including its 20 gsm-nonwoven backsheet (Petition at 32-33), which PO takes no issue with (*see* POR at 29). *See Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1349 (Fed. Cir. 1999).

Paper 22 (Reply), 5-6 (annotated).

Petitioner Disclaims Inherency

PO similarly errs in its contention that the Benning-Karami '626 diaper's wing and backsheet nonwovens "would not necessarily be able to engage" fasteners. POR at 50-55. This contention first fails as non-responsive. Petitioner's argument is that the Benning-Karami '626 diaper would have obviously—not inherently—included such fastener-engaging nonwovens for size adjustability: "implementing Karami '626's teachings would have [been] ... such that the hooks would engage either of the front wings 34 for larger-waisted users, or backsheet for smaller-waisted users." Petition at 51-55 (including evidence cited therein). And PO does not contest a POSITA's ability or motivation to do so (*supra*).

Paper 22 (Reply), 17-18 (annotated).

Petitioner Disclaims Inherency

Karami '626's teachings in Benning's diaper would have selected any one of these parameters in a way that brought a higher-basis-weight wing-nonwoven's fastener-retaining forces below a lower-basis-weight backsheet-nonwoven's fastener-retaining forces.⁴ See POR at 53-56, 59-61; *see also* EX2004 at ¶¶ 99-110. Fatal to PO's position, Petitioner's evidence thus remains the sole evidence (*see, e.g.*, EX1012 at ¶128, EX1040 at 2:35-39, EX1044 at 5:3-7, EX1001 at 13:42-49, 7:25-32, each cited in Petition at 59-60; *see also, e.g.*, EX1012 at ¶¶120-121)—along with PO's telling silence—on the cogent factual issue: whether the claimed retaining forces would have naturally resulted from the Benning-Karami '626 diaper. *See Par Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014).

Paper 22 (Reply), 23 (annotated).

Karami '772-Benning Combination Fails

Limitation 1[c][4]

Because the outer nonwovens of wings 131, 133 are treated, while stay-away zone 160's is not, the retaining forces (e.g., shear strengths) between fasteners 150a-150d and the outer surface of containment assembly 120 are lower than those between the fasteners and the outer faces of the wings. EX1003, ¶¶[0036]-[0037] (“water jet treatment and/or aperturing ... increase[] shear and peel strength”), [0053], FIG. 8; EX1012, ¶¶67-70, 74-77.

Even in stay-away zone 160, retaining forces between fasteners 150a-150d and backsheet 130 were sufficient to hold the diaper on a wearer. EX1012, ¶¶68-70, 75. Karami '772's backsheet—like Karami '626's—is a film-nonwoven laminate, with a 5-45 gsm nonwoven. EX1003, ¶¶[0031], [0046]; EX1004, ¶¶[0063]-[0065] (film-nonwoven laminate backsheet, with nonwoven “basis weight

Paper 12 (Petition), 32 (annotated).

Karami '772-Benning Combination Fails

Because “fasteners 150a-150d can securely engage with any portion of the wings 131 and 133,” fastening is “not restricted to specific landing zones,” and diaper 100 has greater size-adjustability. EX1003, ¶¶[0048]; EX1012, ¶74. A POSITA would have understood that the hooks would still attach to the backsheet’s stay-away zone, while the better affinity to wings 131, 133 would encourage fastening thereto for intended sizing. See EX1003, ¶¶[0037], [0053] (“diminished affinity” (emphasis added)), TABLE 1 (shear forces with untreated nonwovens); EX1028, ¶¶[0021], [0024], [0049]-[0051] (central stay-away zone 100, with no affinity rather than diminished affinity, prevents “improper sizing of diapers”); EX1012, ¶¶68-70, 75-77.

Paper 12 (Petition), 23-24 (annotated).

Karami '772-Benning Combination Fails

68. Karami '772 tested the peel and shear forces between various fasteners and treated and untreated nonwovens “using a modified version of the ASTM standardized testing procedures” that is left largely unexplained. Karami '772 at ¶ [0041] and TABLE 1. Nevertheless, Karami '772’s testing illustrates the improved hook affinity resulting from its treatments. Karami '772 at TABLE 1. Furthermore, as these tests confirmed, there still were retaining forces between the hooks and untreated nonwovens. See Karami '772 at ¶¶ [0036]-[0037] (treatments yielded “better affinity”) [0053] (nonwoven without treatment “will have diminished affinity”), and TABLE 1 (showing there are still shear forces with untreated nonwovens).

69. These retaining forces between the hook fastener and the untreated nonwoven were high enough to hold the diaper on a wearer during use.

Ex. 1012 (Jezzi Dec.), ¶¶ 68-69 (annotated).

70. This understanding is confirmed by Karami '626 which teaches a nonwoven specifically designed for engaging with hooks of a hook-type fastener when “use[d] by both large- and small-waisted persons.” Karami '626 at ¶¶ [0007]-[0009] and [0039]. Karami '626’s described nonwoven is preferably a spunbond

Thus, as Karami '772’s untreated nonwoven may be the same nonwoven and hook fastener suitable to secure an absorbent article to a wearer—as explained by Karami '626—a POSITA would have recognized the retaining forces between Karami '772’s fastener and untreated nonwoven were suitable to secure an absorbent article to a wearer when the article is in use.

Ex. 1012 (Jezzi Dec.), ¶¶ 70 (annotated).

Karami '772-Benning Combination Fails

75. At least a portion of the nonwoven of each of front wings 131 and 133 is “water jet treated and/or apertured” such that the retaining forces between fasteners 150a-150d and the wings is “significantly higher.” Karami '772 at ¶ [0048]. As shown in FIG. 8 (below), a portion of backsheet 130’s nonwoven that underlies containment assembly 120 can remain untreated such that it has “diminished affinity to hook-type fasteners in relation to the remainder of the front waist portion” to define a stay-away zone 160. Karami '772 at ¶¶ [0047]-[0048] (describing treatment of wings 131 and 133 of backsheet 130) and [0053] and FIG. 8¹ (confirming that the entire front waist portion of the backsheet can be treated

Ex. 1012 (Jezzi Dec.), ¶ 75.

except for a small portion that remains untreated and forms the stay-away zone). As explained in my paragraphs 68-70, above, the retaining forces between the fasteners 150a-150d and stay-away zone 160 (i.e., untreated nonwoven) are sufficient to hold diaper 100 on a wearer. Karami '772 at ¶ [0053] (stay-away zone is formed by portion of backsheet nonwoven that is not subjected to water jet treatment). This is further illustrated by Karami '626’s diaper which utilizes only two fasteners—of the same type that is used in Karami '772’s examples—to connect to an untreated nonwoven that is “suitable for use by both large- and small-waisted persons.” Karami '626 at FIGs. 9-10 and ¶¶ [0039], [0055] and [0060] (“Binder ... #42-288-HX-200-PP3,” which is the Binder 25445). A POSITA would have understood Karami '772’s four fasteners, when connected to its untreated nonwoven, would have yielded sufficient retaining forces to secure diaper 100 around a wearer, when in use.

Paper 1012 (Jezzi Dec.), ¶ 75 (annotated).

Karami '772-Benning Combination Fails

68. Karami '772 tested the peel and shear forces between various fasteners and treated and untreated nonwovens “using a modified version of the ASTM standardized testing procedures” that is left largely unexplained. Karami '772 at ¶ [0041] and TABLE 1. Nevertheless, Karami '772's testing illustrates the improved hook affinity resulting from its treatments. Karami '772 at TABLE 1. Furthermore, as these tests confirmed, there still were retaining forces between the hooks and untreated nonwovens. See Karami '772 at ¶¶ [0036]-[0037] (treatments yielded “better affinity”) [0053] (nonwoven without treatment “will have diminished affinity”), and TABLE 1 (showing there are still shear forces with untreated nonwovens).

69. These retaining forces between the hook fastener and the untreated nonwoven were high enough to hold the diaper on a wearer during use.

Ex. 1012 (Jezzi Dec.), ¶¶ 68-69 (annotated).

Q. In paragraph 68 of your declaration --

A. Okay.

Q. -- you state that Karami '772 uses a modified ASTM standard to obtain peel and shear data, right?

A. Yes.

Q. How was the test modified?

A. I have no idea. I don't think they state exactly what they're doing.

Ex. 2003 (Jezzi Dep.), 116:10-18.

Q. Can you make any determinations on reported shear and peel strengths when you don't know what the test was?

A. Not really, I cannot.

Ex. 2003 (Jezzi Dep.), 117:1-4.

So I cannot make heads or tails of these numbers, honestly. And -- you know, so it was a

Ex. 2003 (Jezzi Dep.), 119:8-9.

Karami '772-Benning Combination Fails

69. These retaining forces between the hook fastener and the untreated nonwoven were high enough to hold the diaper on a wearer during use.

70. This understanding is confirmed by Karami '626 which teaches a nonwoven specifically designed for engaging with hooks of a hook-type fastener when “use[d] by both large- and small-waisted persons.” Karami '626 at ¶¶ [0007]-

Ex. 1012 (Jezzi Dec.), ¶¶ 69-70 (annotated).

A. Well, what you're -- okay. I got it. You're putting the outer cover on outside of the wings.

Q. Correct. Yes.

A. Well, they're designed -- okay. Go ahead. There are design flaws with that, but go ahead.

Ex. 2003 (Jezzi Dep.), 158:2-8.

Q. And I think we discussed, in the T-shaped diaper, all of the fasteners engage the wings, correct?

A. It appears in their executions they do.

Ex. 2003 (Jezzi Dep.), 163:18-21.

Q. And as we just discussed, the T-shaped brief doesn't use the backsheet of the front and back portions to engage fasteners, correct?

A. Yes.

Ex. 2003 (Jezzi Dep.), 164:16-19.

Karami '772-Benning Combination Fails

TABLE 1
Hook Peel and Shear Strength Comparison
2" long x 1" wide Hook Samples (In a tape tab + finger lift)

	Binder 25445 (TAPE52) Hook Samples						Binder 65445 Hook Samples	
	FQN 33.9 gsm	FQN 33.9 gsm	FQN 20 gsm	FQN 20 gsm	FQN 20 gsm	FQN 20 gsm	FQN 33.9 gsm	FQN 33.9 gsm
	Spunbond	Spunbond	Spunbond	Water Jet	Water Jet	Water Jet	Spunbond	Spunbond
	33.9 gsm	Nonwoven-	Nonwoven-	Nonwoven-	Treated	Nonwoven-about	33.9 gsm	Nonwoven-
	Spunbond	about 16	about 32	Treated	Nonwoven-about	16 pins/sq in	Spunbond	about 16
	Nonwoven	pins/sq in	pins/sq in	Nonwoven	16 pins/sq in	Nonwoven	Nonwoven	pins/sq in
<u>1st Peel Strength</u>								
Load at Max Load (g/2 in)	142.628/	298.389/	443.046/	532.557/	613.135/		78.026/	292.842/
Shear Strength	25.7	25.2	85.3	96.8	83.8		56.1	52.1
<u>1st Peel Strength</u>								
Load at Max Load (g/2 in)	1094.645/	2924.343/	3325.295/	993.601/	1686.611/		1616.699/	2709.794/
Shear Strength	569.7	298.9	420.2	315.5	303.2		586.9	462.9
	Binder 65445 Hook Samples			Velcro USA Hook Samples				
	FQN 20 gsm	FQN 20 gsm	FQN 20 gsm	FQN 33.9 gsm	FQN 20 gsm	FQN 20 gsm	FQN 20 gsm	
	Spunbond/	Spunbond/	Spunbond/	Spunbond/	Spunbond/	Spunbond/	Spunbond/	
	Water Jet	Water Jet	Water Jet	Water Jet	Water Jet	Water Jet	Water Jet	
	Treated	Nonwoven-about	Nonwoven-	Nonwoven-	Nonwoven-	Nonwoven-	Nonwoven-	
	Nonwoven	16 pins/sq in	16 pins/sq in	16 pins/sq in	16 pins/sq in	16 pins/sq in	16 pins/sq in	
<u>1st Peel Strength</u>								
Load at Max Load (g/2 in)	231.120/	530.477/	104.840/	262.006/	446.605/		673.645/	
Shear Strength	114.4	77.2	60.1	52.2	55.9		131.3	
<u>1st Peel Strength</u>								
Load at Max Load (g/2 in)	1516.114/	1677.780/	203.931/	1942.152/	1032.605/		2311.901/	
Shear Strength	256.1	640.3	132.5	613.1	132.6		72.1	

NOTES: All above testing was done peeling and shearing from the 2 inch length side of the hook samples.

Ex. 1003 (Karami '772), Table 1 (annotated).

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1 levels for the backsheet.

2 Q. And I think, as we discussed earlier,

3 Karami '772 didn't actually test an untreated 20

4 gsm unwoven, correct?

5 A. Correct. But the numbers in that

6 table 1, if you look at them, you know, they

7 basically test not that far off, the 30, 34.

8 Q. Yeah. But if we don't know what the

9 testing procedure was, what the numbers mean --

10 A. But the data --

11 Q. So how do you rely on the numbers in

12 table 1 if we don't know what the testing

13 procedure was?

14 A. You can rely on the numbers within

15 themselves, not outside or making comparisons, so,

16 you know, or establishing what's an acceptable

17 range or not. But within the block of data, as I

18 said before, they are comparable. Because you

19 assume that they're using the same technique on --

20 on every sample.

21 Q. Well, if you look at -- like, look at

22 paragraph 4 of Karami '772.

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Ex. 2003 (Jezzi Dep.), 175:11-20 (annotated).

Karami '772-Benning Combination Fails

2. *Karami '772's Secure Wing-Fastener Engagement Does Not Indicate the Absence of Backsheet-Fastener Engagement*

PO incorrectly contends that Karami '772's "nonwoven must be treated by water jetting and/or aperturing" for the fasteners "to securely engage [it]." POR at 19-22 (emphasis added).

"[A]n object of [Karami '772's] invention is to provide ... a fastener assembly including a hook-type fastening element that does not require a corresponding loop-type fastening element," the functionality of which Karami '772 does not condition on water jetting and/or aperturing. See EX1003 at ¶¶ [0005]-[0007]. The "enhanced shear and peel strength" that Karami '772's water jetting and/or aperturing achieve is merely "[a]nother object ... in at least one embodiment," reflecting that the treatments are not required. See EX1003 at ¶¶ [0008], [0040]; EX1054 at 83:7-15 (there "could be" embodiments "that don't have enhanced she[a]r and peel strength"); EX1012 at ¶¶ 68-70. That treatment being unnecessary is confirmed by Karami '626 achieving secure engagement with an untreated, "conventional nonwoven." EX1004 at ¶¶ [0006]-[0007]; EX1054 at 59:10-15; EX1012 at ¶¶ 68-70.

Paper 22 (Reply), 2-3 (annotated).

which almost completely overlaps the other wing 40. In a conventional T-shaped brief this would present a problem in suitably locating the loop landing zones (that is, the conventional female fastening elements) along the garment-facing surface of each wing 40 if the brief were to be suitable for use by both large- and small-waisted persons. Water jet treating and/or aperturing the nonwoven wings 40 obviates the need for corresponding loop-type landing zones to mate with the hook-type fasteners 41, 46 and 48. The increased shear and peel strength of the water jet treated and/or apertured bonded nonwoven allows the hook-type fastener 41 at the free end of one of the wings 40 to be securely fastened at any point along the outer surface of the other wing 40 and the hook-type fasteners 46, 48 on the front portion 22 to be securely fastened at any point along the outer surface of either wing 40. Thus, the T-shaped diaper 10 is suitable for both large-waisted and small-waisted wearers.

Ex. 1003 (Karami '772), [0042] (annotated).

[0040] Example 1 below illustrates the advantages provided by the inventive concept of water jet treating and/or aperturing a bonded nonwoven to enhance shear and peel strengths of a fastening system.

Ex. 1003 (Karami '772), [0040] (annotated).

Karami '772-Benning Combination Fails

“[A]n object of [Karami '772's] invention is to provide ... a fastener assembly including a hook-type fastening element that does not require a corresponding loop-type fastening element,” the functionality of which Karami '772 does not condition on water jetting and/or aperturing. See EX1003 at ¶¶ [0005]-[0007]. The “enhanced shear and peel strength” that Karami '772's water jetting and/or aperturing achieve is merely “[a]nother object ... in at least one embodiment,” reflecting that the treatments are not required. See EX1003 at ¶¶ [0008], [0040]; EX1054 at 83:7-15 (there “could be” embodiments “that don't have enhanced she[a]r and peel strength”); EX1012 at ¶¶68-70. That treatment being unnecessary is confirmed by Karami '626 achieving secure engagement with an untreated, “conventional nonwoven.” EX1004 at ¶¶ [0006]-[0007]; EX1054 at 59:10-15; EX1012 at ¶¶68-70.

Paper 22 (Reply), 2-3 (annotated).

[0003] Thus, instead of an article or article portion containing a minihook fastener element capable of engaging anywhere along a facing surface of another article or article portion, it has been necessary for the two articles or article portions to be designed such that, during use, the minihook and miniloop fastener elements will be appropriately positioned opposite one another (i.e., juxtaposed) for engagement with one another. This disadvantage of the fastener assembly has been ameliorated to some degree by the use of minihooks fastener elements of relatively small area adapted to engage miniloop fastener elements of relatively great area so that each minihook fastener element could be positioned as desired anywhere within the area of each miniloop fastener element. (The preference for a small minihook fastener element relative to a large miniloop fastener element, rather than vice versa, is founded on both the relative inexpensiveness and the relatively softer, less irritating nature of the latter). Thus, conventional woven or nonwoven articles have had affixed to the surface thereof along one axis (e.g., sewn thereon) a miniloop fastener element strip of greater longitudinal dimensions than the corresponding minihook fastener element, thereby to provide the user with freedom of choice as to where the minihook fastener element would be positioned along the miniloop fastener element strip. For example, see U.S. Pat. No. 5,383,872, U.S. Pat. No. 5,624,429 and U.S. Pat. No. 5,527,305. In this manner the user is provided with a degree of flexibility or choice along one axis, albeit at additional material and manufacturing costs for the strip. It has even been proposed that one entire surface of an article be constituted of a miniloop fastener element in order to provide the user with total flexibility and choice (that is, the ability to position the minihook fastener element anywhere on the article surface), albeit at an even greater material and manufacturing cost for the surface. See, for example, U.S. Pat. No. 5,019,065.

Ex. 1003 (Karami '772), [0040] (annotated).

Karami '772-Benning Combination Fails

Q. And so, the use of the non-woven is unconventional, if I understand you correctly?

A. No. He's talking about spunbonds, and we're hung up with the word conventional. There really is nothing like -- there is no such animal as a

conventional non-woven. All non-wovens are different.

And in this case, like others, there are non-wovens that you can buy that will engage with a hook-type fastener, and there are a lot of non-wovens that are made that will not engage with a hook-type fastener. And even if they do engage with a hook-type fastener, it may not be the range or minimum level that is required to form a closure.

Ex. 1054 (Butterworth Dep.), 59:23-60:8 (annotated).

103. For a nonwoven, the method and conditions by which the nonwoven fabric has been made, the inclusion or removal of materials from the fibers, and finishing (mechanical, thermal, chemical) employed are very significant. Fiber material (typically a polyolefin such as polypropylene and polyester), fiber cross-sectional shape and crimping, diameter and finish all impact fiber, and hence, fabric behavior. If the fibers are too fine, they will inhibit penetration of the mechanical "hooks" and those that do snag fibers will find they do not have adequate load bearing capability. If the fibers are too coarse, then then they will not engage properly with the parts of the mechanical closure. Further, at the finishing state of nonwoven products, factors such as thickness, consolidation by point bonding, thermal stabilization, and bonding density and pattern, all impact subsequent performance as a closure surface. Once formed as a nonwoven, the fiber segments available to be snagged by mechanical closure parts must be engineered in such a way that the connected fastener can perform in a refastenable manner. Usually, the nonwoven works in conjunction with a film or other substrate attached by lamination specifically designed to meet the barrier and refastenable requirements of the product in use. It should be emphasized that the steps taken to create a suitable refastenable component are quite specific to each end use, be it a disposable diaper, a T-shaped diaper, an incontinence training pant, or a larger incontinence management product intended for bedridden patients.

Ex. 2004 (Butterworth Dec.), ¶ 103 (annotated).

Karami '772-Benning Combination Fails

PO first notes that Karami '772's backsheet nonwoven basis weight range (5-45 gsm (EX1003 at ¶ [0031])) overlaps but extends below Karami '626's (13-50 gsm (EX1004 at ¶ [0065])). POR at 29. And PO contends it wins under alleged strictures of inherency because Karami '772's range includes a 5-gsm-nonwoven backsheet that might not meet the Diaper-Holding Requirement. *Id.* But PO's argument is a strawman because these grounds are based on Karami '772's disclosed 10-30-gsm-nonwoven backsheet—not the 5-gsm-nonwoven backsheet—and specifically including its 20 gsm-nonwoven backsheet (Petition at 32-33), which PO takes no issue with (*see* POR at 29). *See Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1349 (Fed. Cir. 1999).

Paper 22 (Reply), 5 (annotated).

Even in stay-away zone 160, retaining forces between fasteners 150a-150d and backsheet 130 were sufficient to hold the diaper on a wearer. EX1012, ¶¶68-70, 75. Karami '772's backsheet—like Karami '626's—is a film-nonwoven laminate, with a 5-45 gsm nonwoven. EX1003, ¶¶[0031], [0046]; EX1004, ¶¶[0063]-[0065] (film-nonwoven laminate backsheet, with nonwoven “basis weight
Paper 12 (Petition), 32 (annotated).

Karami '772-Benning Combination Fails

[0031] Backsheet **32** is made of a liquid and/or vapor-impervious material which may be selected from the same group of materials from which the top sheet was selected and preferably having a weight of between 5-45 grams per square meter. Unlike topsheet **30**, however, the material used for backsheet **32** is preferably rendered hydrophobic by omitting the surfactant discussed above with respect to topsheet **30**. Backsheet **32** may be manufactured by well known methods such as thermal bonding, chemical bonding, spun bonding and hydroentanglement. The backsheet **32** may also be a composite of a film and at least one nonwoven layer attached together by adhesive or heatbonding. The film may be vapor and air permeable but liquid impermeable. The width of the film layer may be narrower than the outer nonwoven layer.

Ex. 1003 (Karami '772), [0031] (annotated).

So I don't think that anybody -- I'm not aware, and I don't think any POSITA in their right mind would look at a 5 gsm for an outer cover, although it's possible; I mean, it's in the range so that you've got to consider it. I certainly would not.

Ex. 2003 (Jezzi Dep.), 191:11-15.

But within the range they gave, you know, it's possible that somebody could be using an outer cover. And if they were to use that light of basis weight, I think the retentive forces would not be very high. I don't know what they would be, but they would be lower.

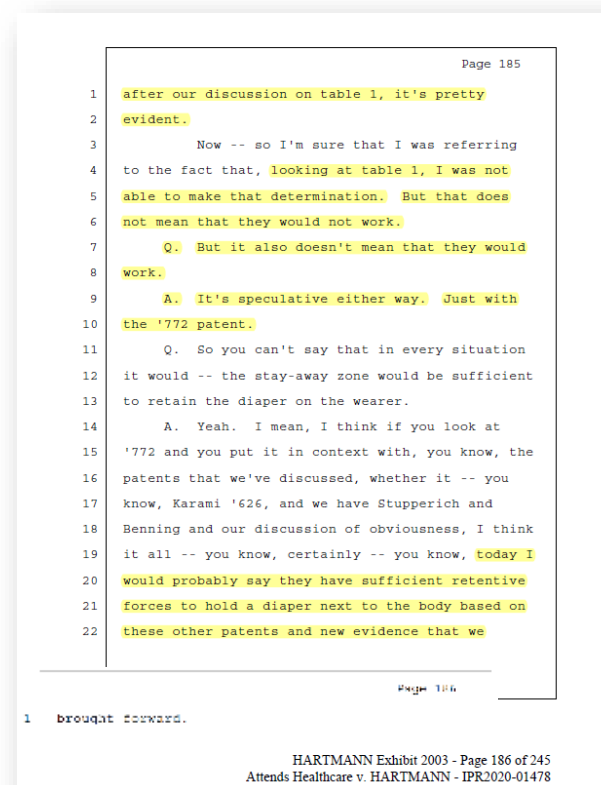
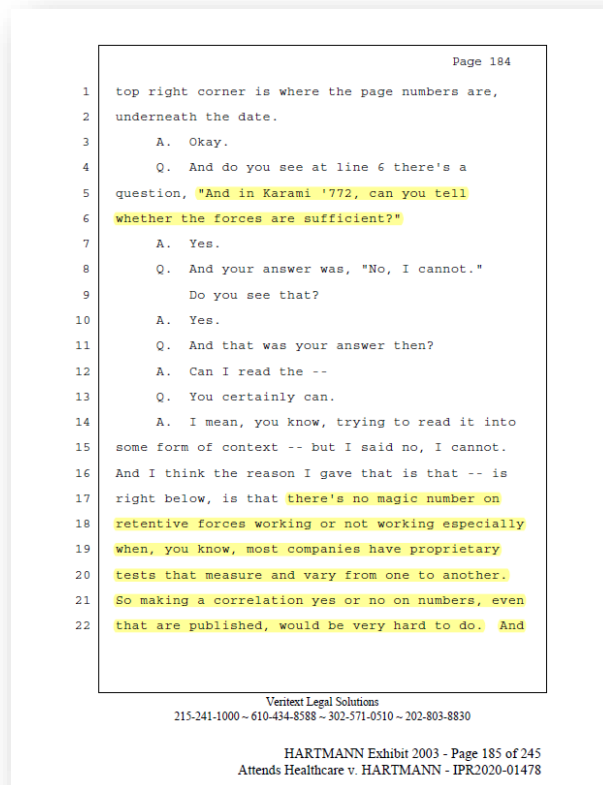
Ex. 2003 (Jezzi Dep.), 192:11-16.

Petitioner's Expert Mr. Jezzi

PO also mischaracterizes Mr. Jezzi's deposition testimony, attempting to extend his statement that Karami '772's TABLE 1 alone renders it "speculative" whether fastener engagement in Karami '772's stay-away zone meets the Diaper-Holding Requirement. POR at 31-32. But in doing so, PO ignores that Mr. Jezzi's opinions are also supported by other evidence, including Karami '626, that answer any questions left by that discrete table. *See* EX2003 at 184:4-186:21. And PO attempts to discount those supported opinions with Mr. Jezzi's use of "probably," but PO neglects the entirety of Mr. Jezzi's unequivocal opinion: "yes, [the retentive forces] are sufficient." *See* POR at 32; EX2003 at 185:11-186:21.

Paper 22 (Reply), 9-10

Petitioner's Expert Mr. Jezzi



Ex. 2003 (Jezzi Dep.), 184:4-186:1 (annotated).

Karami '626

[0002] The present invention relates to an absorbent article, and more particularly to an absorbent article having a fastener element which does not require a special loop-providing landing zone.

[0009] A further object is to provide such an absorbent article wherein, in one preferred embodiment, the fastener assembly provides a peel strength of at least 60 grams per square inch and a shear strength of at least 1300 grams per square inch.

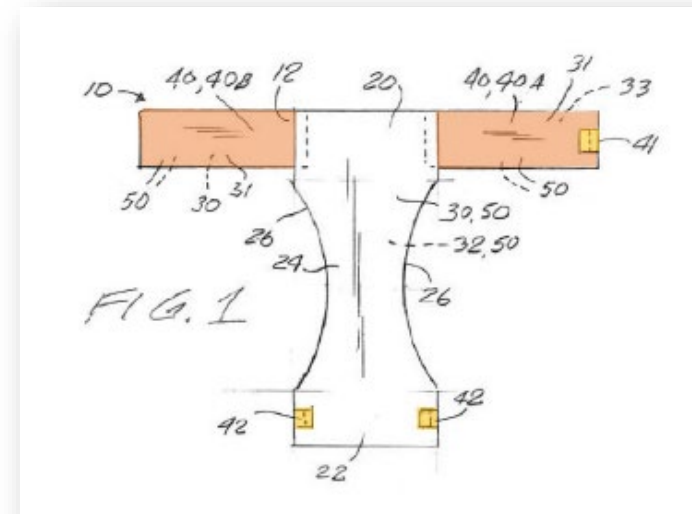
[0010] It is also an object of the present invention to provide such an absorbent article wherein, in one preferred embodiment, the fastener assembly provides size adjustability or other features at the cost of only additional minihook fastener elements.

Ex. 1004 (Karami '626), [0002], [0009], [0010].

Karami '626

82. Karami '626 explains how the T-shaped brief is placed on a wearer and how the fasteners engage. "When the brief 12 is first placed on the wearer, the free ends of the two wings 40 are brought around the sides and front of the waist of the wearer and make a partially overlapping connection about the front of the waist of the wearer." Ex. 1004 (Karami '626) [0037]. As Karami '626 explains, "once the two wings 40 are placed in partially overlapping connection, they, in effect, form (with the back portion 20) a belt 44 encircling the waist of the wearer. The front portion 22 is then passed through the legs of the wearer and raised in front of the wearer until the first laterally spaced pair of fastener elements 42 secured thereto engage the exposed outer surface of the belt 44." Ex. 1004 (Karami '626) [0038]. In this way, all of the fasteners (annotated in yellow below) engage the belt (orange), and the belt secures the T-shaped brief on the wearer.

Ex. 2004 (Butterworth Dec.), ¶ 82 (annotated).

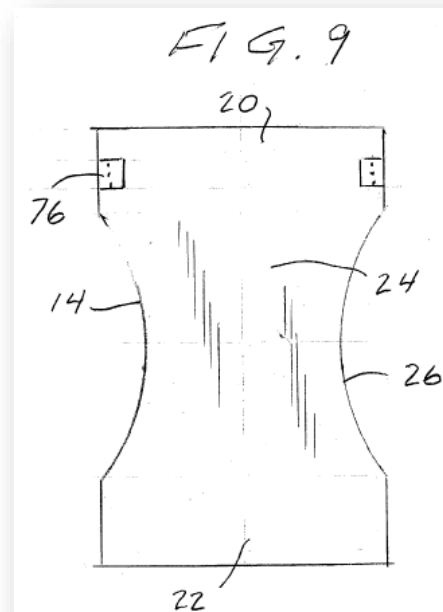


Ex. 1004 (Karami '626), Fig. 1 (annotated).

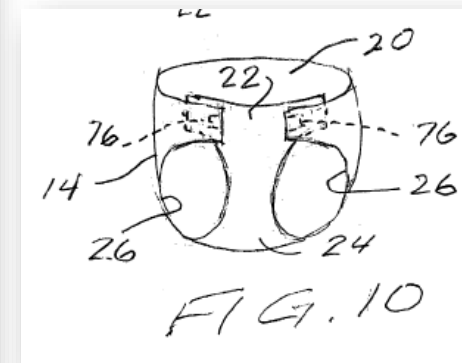
Karami '626

[0055] Referring now to **FIGS. 9 and 10**, it will be appreciated by those skilled in the art that the same or analogous improvements in the fit, appearance and economy of diapers **14** according to the present invention, with tape tab or patch fastener elements **76** (adjacent opposed lateral edges of the back portion **20**), may be realized.

Ex. 1004 (Karami '626), [0055].



Ex. 1004 (Karami '626), Fig. 9.



Ex. 1004 (Karami '626), Fig. 10.

Benning

[0005] Taking an absorbent incontinence article of the type initially described as the starting point which has relatively wide material sections attached to the main body portion, it would be desirable to improve the handling of these material sections during production in a high-speed machine and to make handling the incontinence article as user-friendly as possible when it is employed by the wearer or by care-givers.

Ex. 1002 (Benning), [0005] (annotated).

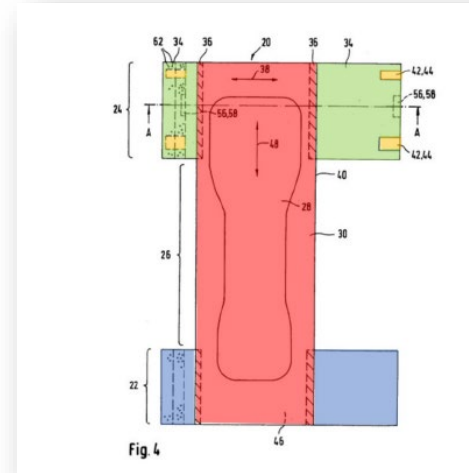
[0006] An absorbent incontinence article of the type initially described, has the material sections which are folded over themselves at least along one fold line running in the longitudinal direction and partial sections of the material sections, folded over each other and contacting each other over large areas in this folded configuration, and are releasably attached at affixation point or areas.

Ex. 1002 (Benning), [0006] (annotated).

Benning

[0007] While the hip belt on T-shaped diapers is relatively narrow, it is desirable for absorbent incontinence articles of the type initially described to have fairly wide lateral material sections. Under the present invention, an incontinence article has been created in which the material sections folded over each other are releasably attached to each other so that they are kept in their folded configuration in the high-speed manufacturing machine and do not flutter. Even when the hygiene article is removed from the packaging and is being prepared for application, the releasable attachment of the folded material sections proves advantageous. It makes the incontinence article user-friendly and it proves particularly advantageous when used on persons requiring a high degree of personal care. For example, the incontinence article is frequently applied to patients requiring care who are lying on their side. In this situation, one of the material sections projecting laterally beyond the main body portion must be fed under the patient. This process of feeding the section under the patient is considerably simplified with releasably attached material sections in accordance with the invention.

Ex. 1002 (Benning), [0007] (annotated).



Ex. 1002 (Benning), Fig. 4 (annotated).

[0030] To close the incontinence article when it is worn by a user, the material sections have closures which can be designed to grip mechanically or adhesively and which for their part are advantageously arranged in a folded configuration on the material sections and can be unfolded for use. It proves expedient if the material sections in the back region have closures of a type which can act in concert in a releasably gripping or adhering fashion with a landing zone on the main part of the diaper.

Ex. 1002 (Benning), [0030] (annotated).

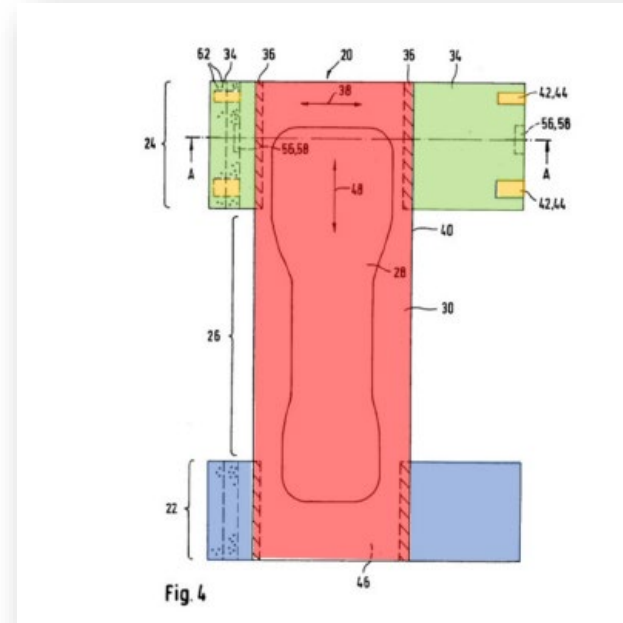
Benning

[0053] The incontinence article in accordance with the invention is shown schematically in FIGS. 4 to 7. It comprises a main body portion identified in general by the reference numeral 20, often described as the chassis. The main body portion 20 comprises a front region 22, a back region 24 and a crotch region 26 between them which is positioned between the legs of a wearer when the hygienic article is applied to a wearer. The main body portion 20 comprises an absorbent core 28 which is dimensioned to receive and permanently store bodily fluids in a suitable fashion. The absorbent core 28 has a fluid-impermeable underlayer 30 which can also form the outer visible side of the incontinence article. A fluid-permeable topsheet 32 can be provided above the absorbent core 28, shown in the sectional view of FIG. 5.

Ex. 1002 (Benning), [0053].

[0055] FIG. 4 shows the right material section 34 in the drawing in its completely unfolded state. It extends in the transverse direction 38 beyond the matching lengthwise edge 40 of the main body portion 20 in the direction encircling the hips. The right material section 34 has two closures 42 in the form of closing tapes 44 folded over themselves which are unfolded when the article is to be used in the intended manner. The tapes 44 interact in a releasably adherent manner with an outside 46 of the front region 22 of the main body portion 20.

Ex. 1002 (Benning), [0055] (annotated).



Ex. 1002 (Benning), Fig. 4 (annotated).

Benning

[0033] The material sections attached to the main body portion can be configured in accordance with another aspect of the invention in such a way that the sections are less rigid than the main body portion or the chassis-forming materials of the main part, such as in particular the backsheet or a laminate of the main part consisting of the backsheet and topsheet. In this way a skin-friendly side section of the hygienic article can be achieved, which preferably suggests a woven or a non-woven material and is experienced as pleasant by the wearer.

Ex. 1002 (Benning), [0033] (annotated).

Petitioner's Expert Mr. Jezzi

29. One nonwoven parameter that affected its characteristics—such as softness and strength—was basis weight, which was the weight of a unit area of fabric and was often expressed as grams per square meter (gsm or g/m²) or ounces per square yard (osy). INDA Glossary at 11; *see, e.g.*, Young at 1:21-41 (“[W]hile strength and coverage may be increased by an increase in basis weight, the softness tends to decrease.”); Kleinschmidt at 2:19-32 and 8:11-38 (high basis weight region “provide[s] a side panel delivering the material strength needed for securing a fastening device to the diaper” while the lower basis weight region “deliver[s] a softness that is comfortable to the wearer’s skin”). While diapers used nonwovens

Ex. 1012 (Jezzi Dec.), ¶ 29 (annotated).

materials” into its design choice). Additionally, when selecting basis weight, there was generally a trade-off between nonwoven softness and strength, with higher basis weight nonwovens tending to be stronger and lower basis weight nonwovens tending to have a more “cloth-like” feel. *See, e.g.*, Young at 1:21-41 (“[W]hile strength and coverage may be increased by an increase in basis weight, the softness tends to decrease.”). For this reason, it was known to use different basis weight nonwovens

Ex. 1012 (Jezzi Dec.), ¶ 92 (annotated).

Benning-Karami '626 Combination Fails

These no-affinity stay-away zones actually show Karami '772's diminished-affinity stay-away zone do sufficiently engage fasteners. As Mr. Butterworth agreed, the no-affinity stay-away zones each destroy a portion of their respective backsheet-nonwoven's ability to engage a fastener to prevent wasteful diaper mis-sizing (*see* EX1003 at ¶ [0053]; EX1054 at 150:18-151:14, 152:22-153:5, 155:16-156:13 (Karami '772); EX1028 at ¶¶ [0049]-[0051]; EX1054 at 66:3-14, 68:20-72:8, 77:22-78:8 (Damaghi)), which only makes sense if those backsheet-nonwoven portions could otherwise sufficiently engage the fastener to hold a mis-sized diaper on a wearer. In Karami '772, this backsheet-nonwoven portion is the untreated nonwoven in the stay-away zone. *See* EX1003 at ¶¶ [0028], [0031], [0052], [0053], FIG. 8; EX1012 at ¶91. And Damaghi's backsheet-nonwoven portion is the same as Karami '772's. EX1028 at ¶ [0036], [0043], [0051].

Paper 22 (Reply), 4-5 (annotated).

(including when the diaper “popped off”). PO cannot hope to argue that the Benning-Karami '626 diaper, which is founded on size-adjustability (*infra* Section III.A), might have fallen short. Nor can PO fault the Karami '772-Benning diaper

Paper 22 (Reply), 1 (annotated).

As one of Karami '626's absorbent articles (EX1004 at ¶¶ [0011], [0029]-[0030], [0055]), that FIGs. 9-10 diaper “incorporates a fastener assembly consisting exclusively of a minihook fastener ... [and] a conventional nonwoven material” (*id.* at ¶ [0008]) that “is in the article backsheet” (*id.* at ¶ [0016]), which provides “size adjustability”—and thus “the same or analogous improvements in the fit” of the T-shaped diaper—via the minihook fastener's ability to engage any portion of the nonwoven (*id.* at ¶ [0010]-[0011], [0055]), including “in the wings or central portion” of the backsheet (EX1012 at ¶¶104-107).

Paper 22 (Reply), 7 (annotated).

Benning-Karami '626 Combination Fails

[0040] On the other hand, when the T-shaped brief 12 is made according to the present invention so that the fastener elements 41, 42 do not require landing zones and may engage directly with any portion of the nonwoven surface constituting the frontsheet 30, backsheet 32 or wings 40 of the brief, the accommodation of both small and large-waisted persons by a single brief 12 with elastic wings 40 is substantially simplified. The advantage afforded by the present invention is especially noteworthy when the wings 40 are at least partially elastic since there is a tendency for a wearer (or caregiver who puts the brief on the wearer) to stretch one wing 40 more than the other wing 40 during the process of fastening the wings 40 to form the belt 44. This is less of a problem where the back portion 20 as well as the wings 40 are elastic, but more of a problem where the back portion 20 is not elastic and thus the stretching of the belt 44 is limited to the wings 40.

Ex. 1004 (Karami '626), [0040] (annotated).

Q. And I think we discussed, in the T-shaped diaper, all of the fasteners engage the wings, correct?

A. It appears in their executions they do.

Ex. 2003 (Jezzi Dep.), 163:18-21 (annotated).

Q. You would agree with me that paragraph 65 is referring to the T-shaped brief, right?

A. Yes.

Q. And as we just discussed, the T-shaped brief doesn't use the backsheet of the front and back portions to engage fasteners, correct?

A. Yes.

Ex. 2003 (Jezzi Dep.), 164:13-19 (annotated).

Benning-Karami '626 Combination Fails

[0041] For the extra-large waisted wearer, the wings 40 need not be secured together at the front of the wearer to form (with the back portion 20) a belt 44. Instead, they are secured by the wearer to opposite lateral edges of the front portion 22 by fastener elements 42 so that the wings 40 form a belt 44 including both the front and back portions 22, 20.

Ex. 1004 (Karami '626), [0041] (annotated).

[0050] When a small-waisted person wears a conventional T-shaped brief, the first or outer wing 40A (with the primary fastener element) overlaps the second or inner wing 40B (without the primary fastener element) so that the primary fastener element secures the free end of the first wing 40A to the second wing 40B (albeit more to one side of the wearer than to the front of the waist of the wearer). This leaves the free end of the second wing 40B (beyond the fastening point) supported only by the pressure exerted thereon by the first wing 40A. Accordingly, the free end of the second wing 40B will often simply drop down and hang below the belt 44, thereby presenting a messy, undignified appearance. Further, the free end can poke out and forward to present an unsightly bulge in the outer pants of the wearer. Accordingly, referring now to FIG. 2, an auxiliary fastener element 70 is preferably provided on the outer garment-facing surface 33 of the second wing 40B at or adjacent the free end thereof. This auxiliary fastener element 70 may be used to fasten the free end of the second wing 40B to the overlapping inner body-facing surface 31 of the first wing 40A at a point remote from the free end of the first wing 40A, thereby to maintain the free end of the second or inner wing 40B neatly in place under the first or outer wing 40A.

Ex. 1004 (Karami '626), [0050] (annotated).

[0051] When a small-waisted person wears a conventional T-shaped brief, the engagement of the first or outer wing 40A (with the primary fastener element) on the inner or second wing 40B (without the fastener element) occurs not at the center front of the waist of the wearer, but more to one side of the wearer. This can result in the formation of an outwardly protruding pocket at the front center of the briefs, intermediate the inner and outer wings 40B, 40A, thereby preventing a messy, undignified appearance and increasing the possibility of leakage through the pocket. Accordingly, still referring now to FIG. 2, an auxiliary hook fastener 72 is preferably provided on the outer garment-facing surface 33 of the second or inner wing 40B more adjacent the main segment of the back portion 20. Thus the auxiliary fastener element 72 would be located on the front center of the brief 12 when worn by a small-waisted person and provide another point of engagement between the two wings 40A, 40B, so as to prevent formation of a pocket therebetween.

[0052] It will be appreciated that the provision of an auxiliary fastener element 70, 72 on the outer garment-facing surface 33 of the second or inner wing 40B may serve two different functions depending on how far the auxiliary fastener element is spaced from the free end of the second or inner wing 40B. Thus in FIG. 2, the auxiliary fastener element 70 on the second or inner wing 40B is adjacent the free end thereof, thereby to maintain that free end under the first or outer wing 40A; while the auxiliary fastener element 72 is well spaced from the free end of the second or inner wing 40B, thereby to maintain the overlapping portions of the wings 40A, 40B in contact in front of the wearer and avoid formation of a pocket therebetween.

Ex. 1004 (Karami '626), [0051] (annotated).

Benning-Karami '626 Combination Fails

[0007] Although such a loopless fastening system is more convenient for the user, there may be a tendency to take advantage of the unlimited landing area provided by loopless fasteners to use diapers that are not properly sized to the wearer. Particularly, diapers that are too large may still be nominally fitted to an individual due to the ability of the loopless fasteners to gather in the slack created by the oversized diaper. This practice is wasteful as larger diapers are likely to be more expensive, and require more material to manufacture.

Ex. 1028 (Damaghi), [0007] (annotated).

[0020] It is therefore a feature of various embodiments of the invention to address the aforementioned needs by providing a disposable absorbent article, such as a diaper, having a liquid and/or vapor pervious backsheet formed of a single ply of material which extends laterally from a narrow fluid containment assembly having a liquid impervious backing film. The lateral extensions of the backsheet form a plurality of wings by which the absorbent article is secured about the body of a wearer, typically an infant.

[0021] In accordance with an embodiment of the invention, the diaper is provided with loopless fasteners on one portion thereof, and a nonwoven backsheet which functions as a landing zone for the loopless fasteners. Thus, the diaper according to this embodiment of the invention has only hook fasteners without the conventional loop fasteners in any form or shape (e.g., conventional loops in patch form attached to the diaper front waist). A portion of the backsheet is provided with an area to which the loopless fasteners cannot attach. By controlling the size and location of this “stay-away-zone” improper sizing of diapers can be prevented.

Ex. 1028 (Damaghi), [0020], [0021] (annotated).

Benning-Karami '626 Combination Fails

PO's final argument here is that size-adjustability was best achievable using same-basis-weight wing and backsheet nonwovens. POR at 46-47. But this argument is supported wholly by conclusory expert testimony, and should therefore be disregarded. And PO does not dispute that size-adjustability was achievable with different-basis-weight wing and backsheet nonwovens, which is sufficient for obviousness. *In re Fulton*, 391 F.3d 1195, 1200-01 (Fed. Cir. 2004).

Paper 22 (Reply), 17 (annotated).

VGo's expert also succumbed to hindsight bias in her obviousness analysis. Dr. Yanco's testimony primarily consisted of conclusory references to her belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so. See *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir.2012) ("[T]he expert's testimony on obviousness was essentially a conclusory statement that a person of ordinary skill in the art would have known, based on the 'modular' nature of the claimed components, how to combine any of a number of references to achieve the claimed inventions. This is not sufficient and is fraught with hindsight bias."). Dr. Yanco also

InTouch Techs., Inc. v. VGo Commc'ns, Inc.,
751 F.3d 1327, 1352 (Fed. Cir. 2014).

Benning-Karami '626 Combination Fails

[0065] While the nonwoven is preferably a spunbond having a basis weight of 13-50 grams per square meter (gsm), slightly higher basis weights of 20-40 gsm (optimally 34 gsm) are preferred for use on the wings of a T-shaped brief, while relatively lower basis weights of 15-30 gsm (optimally 20 gsm) are preferred for the backsheet of the front and back portions.

Ex. 1004 (Karami '626), [0065] (annotated).

Regardless, PO's myopic focus on Karami '626's T-shaped diaper is misplaced. Karami '626 teaches a "fastener assembly [] composed exclusively of a minihook element and a nonwoven" that "provides size adjustability," the use of which extends beyond T-shaped diapers, including the FIGs. 9-10 diaper that includes backsheet-fastener engagement (Section II.A.4). EX1004 at ¶¶ [0006]-

Paper 22 (Reply), 16 (annotated).

Petitioner Disclaims Inherency

PO similarly errs in its contention that the Benning-Karami '626 diaper's wing and backsheet nonwovens "would not necessarily be able to engage" fasteners. POR at 50-55. This contention first fails as non-responsive. Petitioner's argument is that the Benning-Karami '626 diaper would have obviously—not inherently—included such fastener-engaging nonwovens for size adjustability: "implementing Karami '626's teachings would have [been] ... such that the hooks would engage either of the front wings 34 for larger-waisted users, or backsheet for smaller-waisted users." Petition at 51-55 (including evidence cited therein). And PO does not contest a POSITA's ability or motivation to do so (*supra*).

Paper 22 (Reply), 17-18 (annotated).

Karami '626's teachings in Benning's diaper would have selected any one of these parameters in a way that brought a higher-basis-weight wing-nonwoven's fastener-retaining forces below a lower-basis-weight backsheet-nonwoven's fastener-retaining forces.⁴ See POR at 53-56, 59-61; *see also* EX2004 at ¶¶ 99-110. Fatal to PO's position, Petitioner's evidence thus remains the sole evidence (*see, e.g.*, EX1012 at ¶128, EX1040 at 2:35-39, EX1044 at 5:3-7, EX1001 at 13:42-49, 7:25-32, each cited in Petition at 59-60; *see also, e.g.*, EX1012 at ¶¶120-121)—along with PO's telling silence—on the cogent factual issue: whether the claimed retaining forces would have naturally resulted from the Benning-Karami '626 diaper. *See Par Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014).

Paper 22 (Reply), 23 (annotated).

Petitioner Did Not Establish Obviousness for Retaining Forces Ranges

2. The absorbent incontinence diaper of claim 1, wherein said retaining forces, determined as over-abdomen retaining forces between said closure means and said outer face of said chassis, are 57-20 N/25 mm.

3. The absorbent incontinence diaper of claim 2, wherein said retaining forces, determined as over-abdomen retaining forces between said closure means and said outer face of said side parts in said front area, are 90-58 N/25 mm.

4. The absorbent incontinence diaper of claim 3, wherein said retaining forces, determined as over-abdomen retaining forces between said closure means and said outer face of said chassis in said front area, are 80-60 N/25 mm.

IPR2020-01478, Ex. 1001 ('398 Patent), claims 2-4 (annotated).

2. The absorbent incontinence diaper of claim 1, wherein said retaining forces, determined as over-abdomen retaining forces between said closure means having said mechanical closure aids and said outer face of said main part, are 57-20 N/25 mm or 50-25 N/25 mm.

3. The absorbent incontinence diaper of claim 1, wherein said retaining forces, determined as over-abdomen retaining forces between said closure means having said mechanical closure aids and said outer face of said side parts in said front area, are 90-58 N/25 mm or 80-60 N/25 mm.

IPR2020-01477, Ex. 1001 ('788 Patent), claims 2-3 (annotated).

Petitioner Did Not Establish Obviousness for Retaining Forces Ranges

B. Claimed, Workable Retaining-Forces Were Obvious

While the '398 Patent's apparatus claims do not actually require measuring retaining forces, PO attacks Petitioner's workable-retaining-force argument as purportedly failing to address the retaining forces being measured as "over-abdomen retaining forces" (POR at 34-36), which is incorrect. *See* Petition at 20 ("over-abdomen retaining forces ... are simply [] shear forces"), 40-44; EX1012 at ¶98, incl. n.3 (cited in Petition at 41-42) (explaining that the relied-on 5-80 N/25 mm Stupperich shear retaining forces are measured in the same way as the '398 Patent's over-abdomen retaining forces).

Paper 22 (Reply), 10 (annotated).

Petitioner Did Not Establish Obviousness for Retaining Forces Ranges

Q. And you can't tell from Karami '772 whether or not the retaining forces in claim 2 are disclosed there, correct?

A. That is correct. They don't -- the numbers don't correlate to the test or the -- the units on the table.

Ex. 1012 (Jezzi Dep.), 195:12-17 (annotated).

The Stupperich Combination Fails

PO next argues that “Stupperich does not teach using different retaining forces ... or [different] nonwovens on the same diaper” (POR at 57-58), but this is another strawman because Petitioner never alleged that Stupperich did. Rather, Petitioner established that Stupperich discloses fastener-engaging higher-basis-weight and lower-basis-weight nonwovens, and it would have been obvious to use both in the Benning-Karami '626 diaper, with the higher-basis-weight nonwoven positioned in the wings for increased strength and fastener-retaining forces, and the lower-basis-weight nonwoven positioned in the backsheet for wearer-comfort and cost-savings. Petition at 73-74. As to Petitioner’s actual arguments and evidence (*id.*), rather than present contrary evidence, PO simply contends that they do not exist. POR at 58.

Paper 22 (Reply), 26 (annotated).

The Stupperich Combination Fails

[0058] At the end of the second hip belt section **10b** a closure element **26** is also provided, namely in the form of a flap **26** having mechanical closure elements, which can detachably and adhesively cooperate with counter closure elements on the first hip belt section **10a**, in particular with its entire outer surface, when the hip belt **10** is closed to form a hip opening closed in the peripheral direction of the hip. Advantageously, the outer surface of the hip belt comprises a nonwoven loop-forming nonwoven fabric material according to the invention, which forms the counter closure elements. This loop-forming nonwoven material is schematically indicated by reference number **28** only over a limited length of the first hip belt section. According to a preferred embodiment of the invention, however, the hip belt consists of this nonwoven fabric material **28**, so that the loop-forming component of the nonwoven fabric material forms the entire outer surface of the hip belt.

[0059] To put on the belt diaper **2**, the hip belt **10** is closed on itself and then the main part **4** is brought out between the legs of a user and detachably fixed to the hip belt **10** on both sides of the main part **4** by means of flaps **29** with further mechanical closure elements.

Ex. 1009 (Stupperich), [0058]-[0059] (annotated).

The Stupperich Combination Fails

[0060] The nonwoven material **28** consists of a nonwoven laminate **30**, which is shown schematically in the sectional view in **Fig. 2**. The cutting line runs along a line B-B as shown in **Fig. 3a**. It has a polypropylene spunbonded material layer **32** consisting of fibers of a fiber thickness of 2.2 dtex with a surface weight of 30 g/m² as carrier, which has been pre-consolidated by oval bonding points **34** with a density of 48.37 units/cm² (thermo embossing points), the dimensions of the semi-axes of the oval bonding points being 0.85 mm and 0.59 mm respectively and the pressing area of the oval bonding points correspondingly being 0.394 mm² and the proportion of bonding points in the total area thus being 19.0%. The depth of the bonding points is 0.80 mm. A card web layer **36** is added to this spunbonded material layer **32** by hot calender embossing. In the case shown, the card web consists of hydrophilized polypropylene fibers with a thickness of 4.4 dtex and a fiber length of 40 mm. **Fig. 3** shows a view of the unwinding of the surface of a calender roll, which corresponds to an embossing pattern **38** applied to the first upper side **40** of the card web layer **36** by hot calendering. **Fig. 3** thus simultaneously also shows a schematic view of the first upper side **40** of the nonwoven laminate **30**.

Ex. 1009 (Stupperich), [0060] (annotated).

[0067] In a further exemplary embodiment of the present invention, only the surface weight of the spunbonded fabric was increased to 45 g/m² and the embossed pattern **38** connecting the nonwovens was modified as follows:

Length L1 of the arms **461** of the first segments **46**: 1.0 mm

Width B1 of arms **461** of the first segments **46**: 0.4 mm

Length L2 of second segments **47**: 2.0 mm

Width B2 of the second segments **47**: 0.4 mm

Area percentage of bonded areas: 17.1

Embossing depth of the first and second segments: 0.68 mm

Ex. 1009 (Stupperich), [0067] (annotated).