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(54) ELASTIC FASTENING SYSTEM

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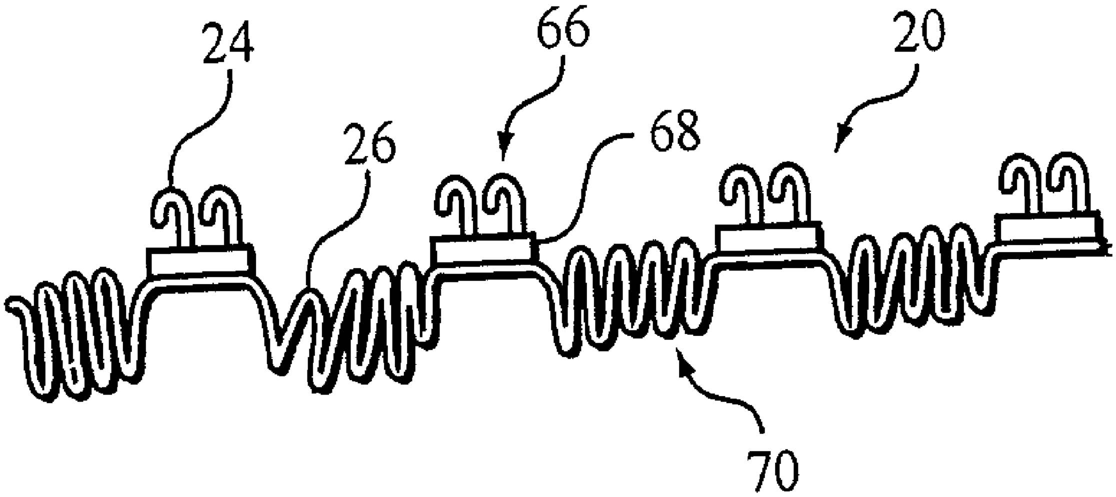
(57) **ABSTRACT**

A hook and loop fastener comprising a hook component and a loop component. The hook component includes a hook backing and a plurality of hooks protruding from the hook backing. The hook backing includes an extensible material. The loop component includes a loop backing and a plurality of loops protruding from it. The loop backing also includes an extensible material.



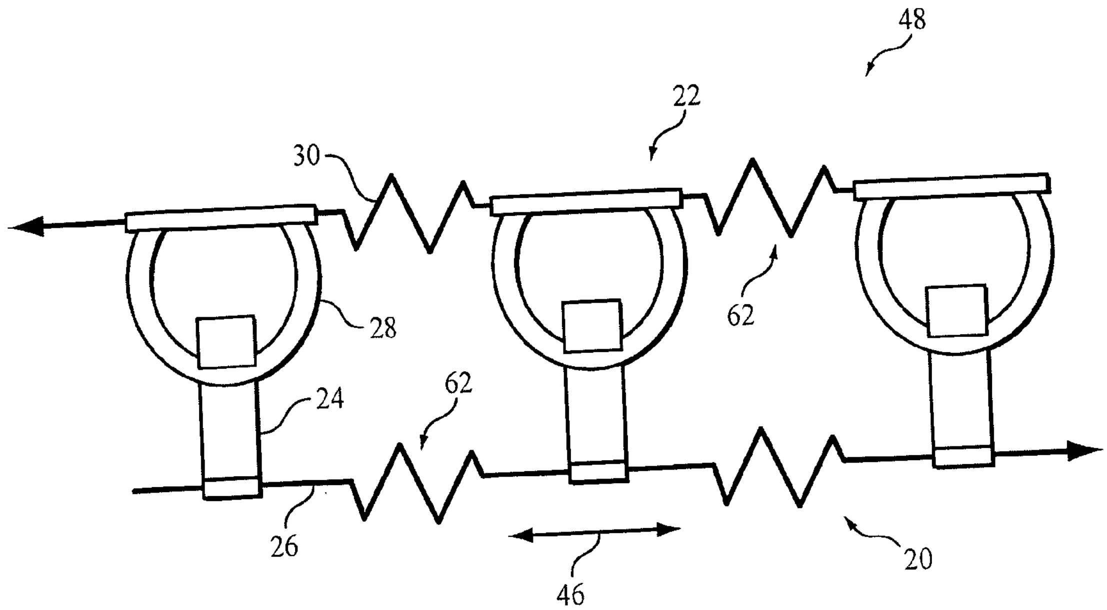


FIG. 1

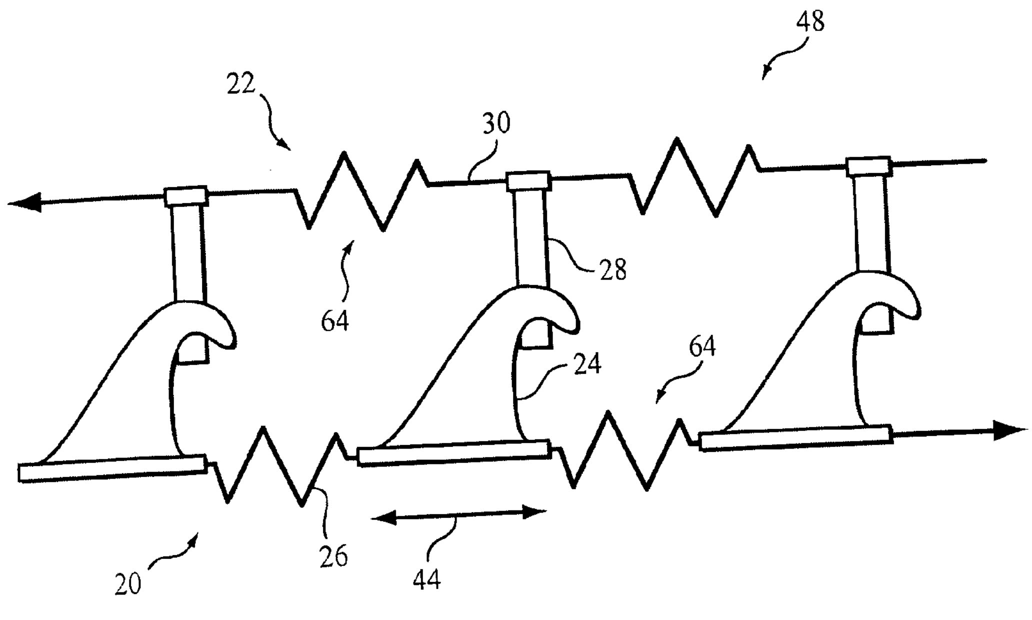


FIG. 2

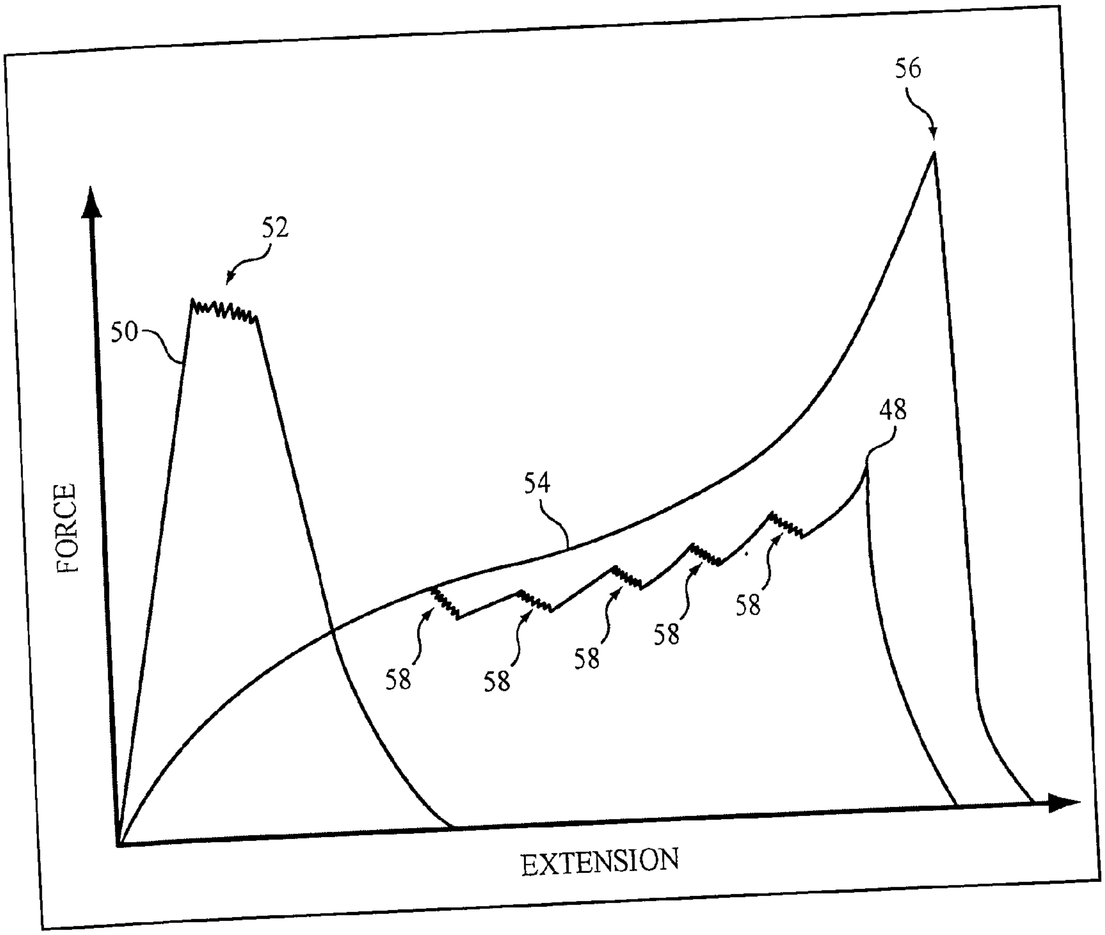


FIG. 3

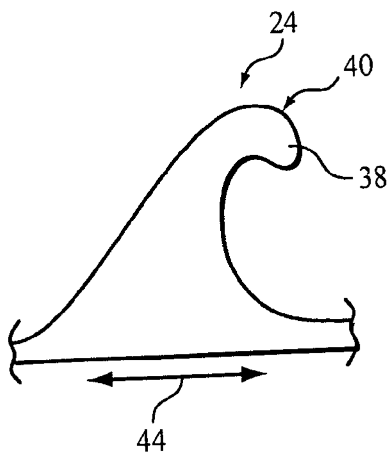


FIG. 4

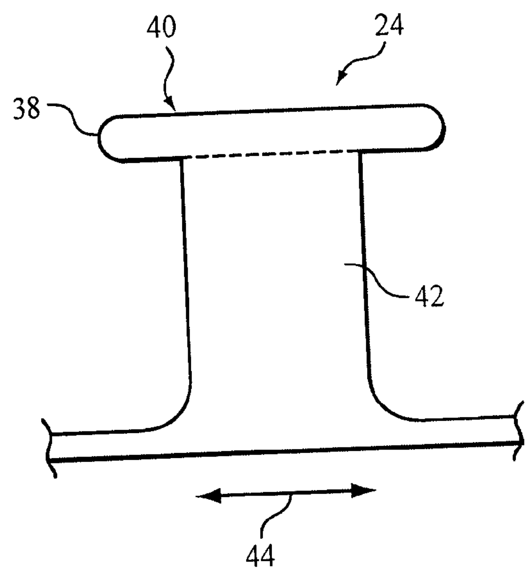


FIG. 5

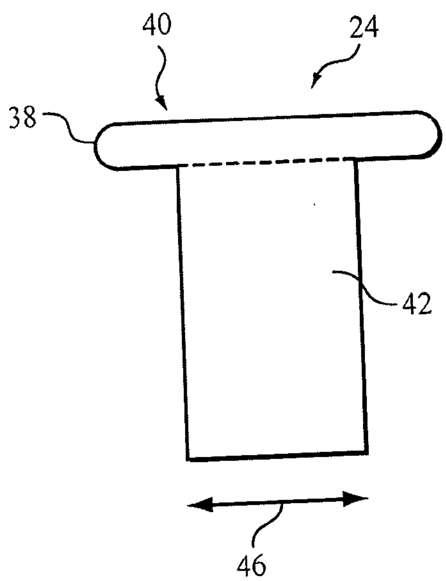


FIG. 6

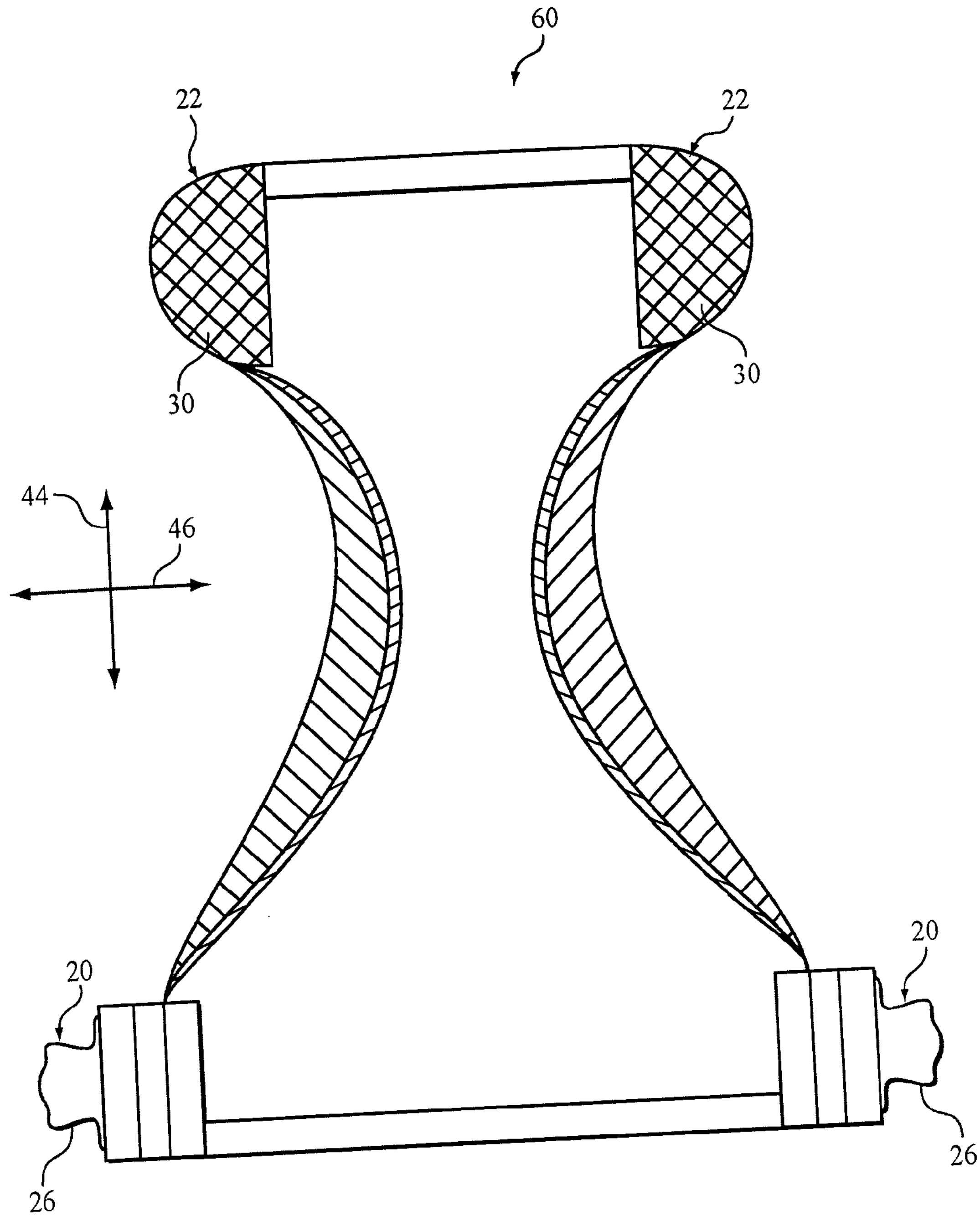


FIG. 7

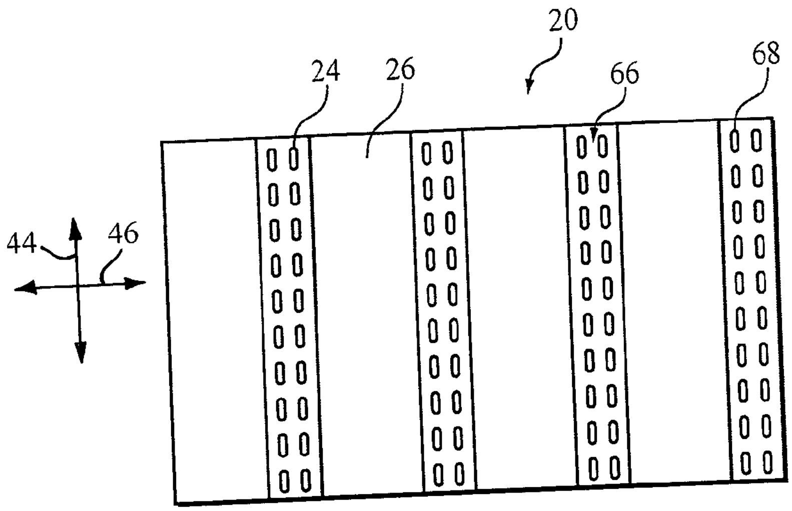


FIG. 8

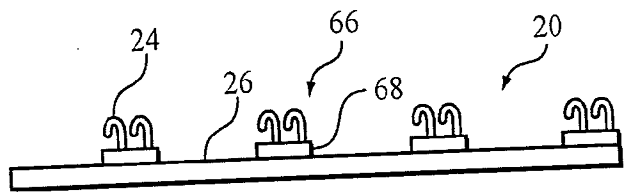


FIG. 9

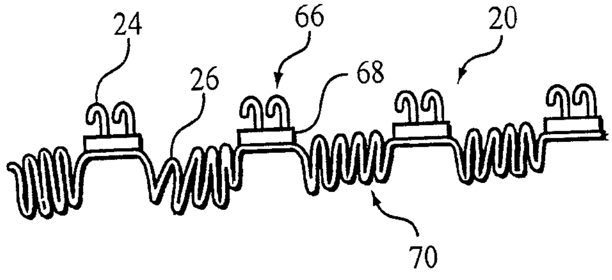


FIG. 10

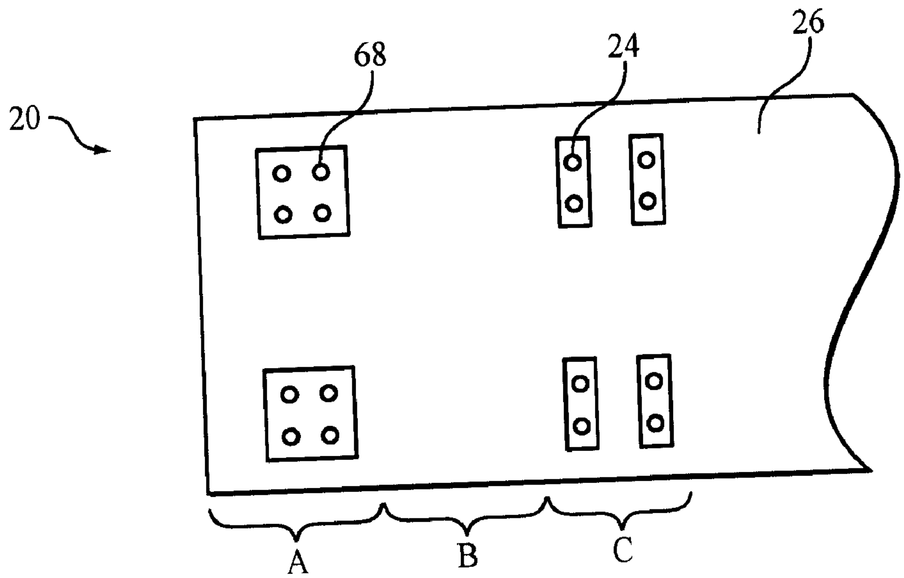


FIG. 11

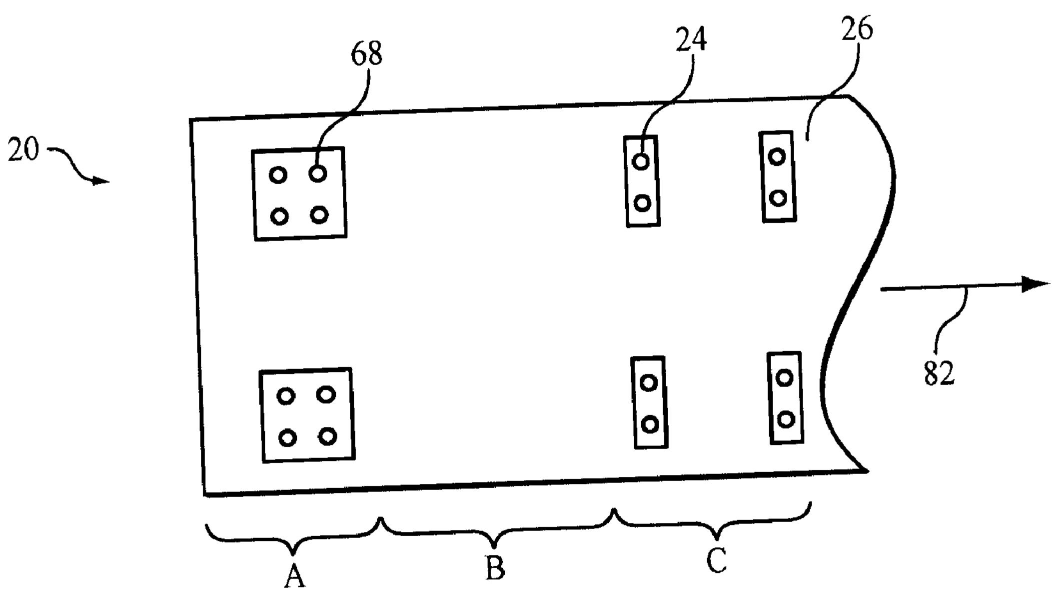


FIG. 11A

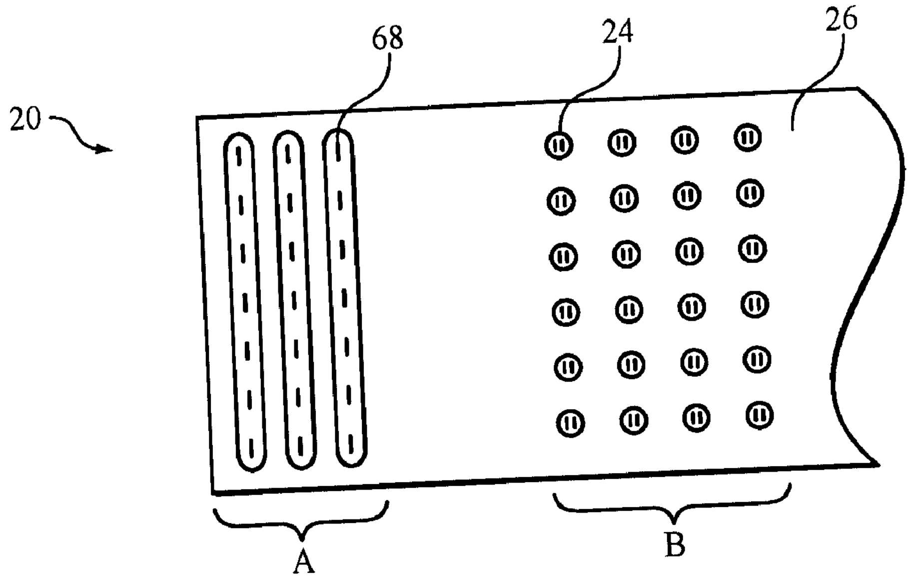


FIG. 12

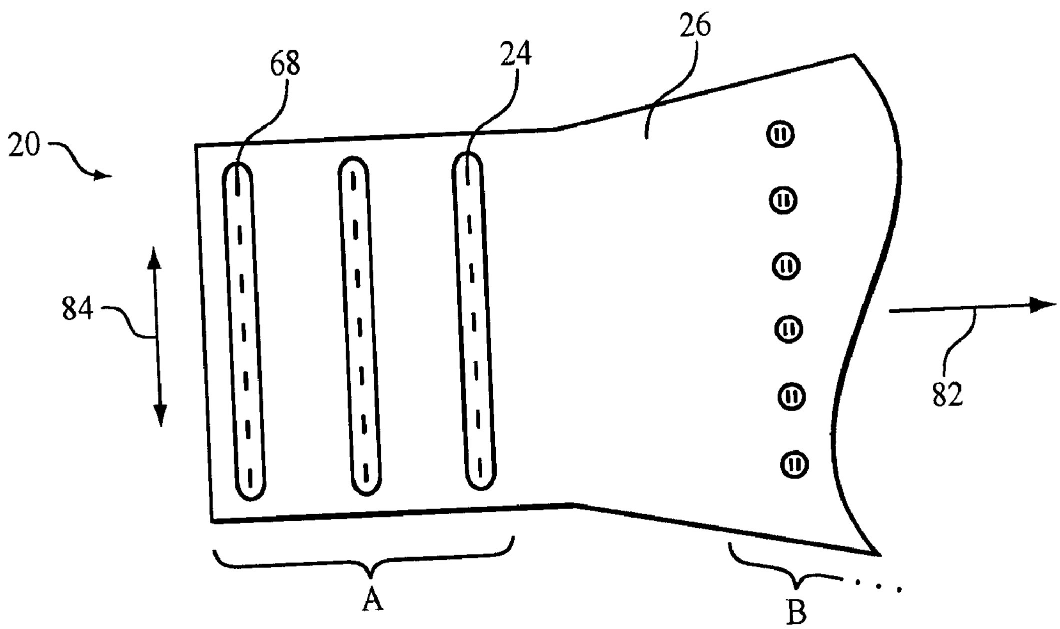


FIG. 12A

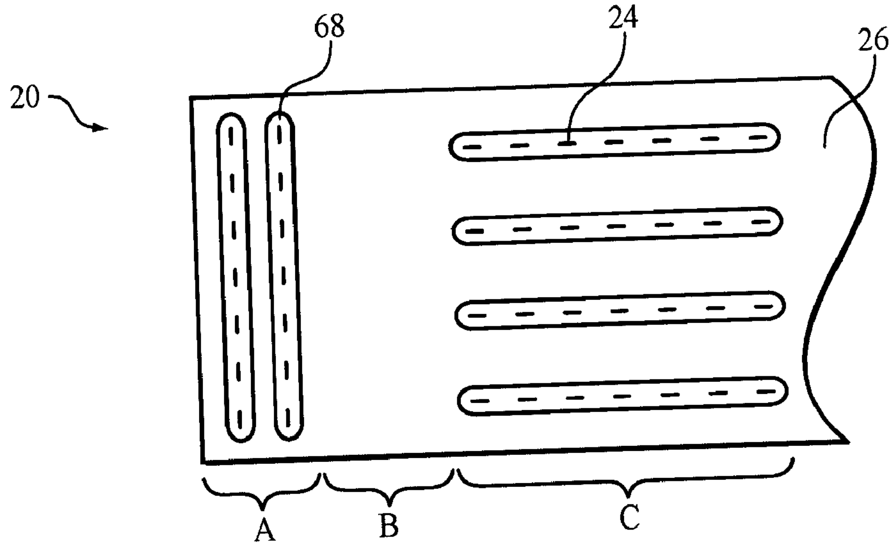


FIG. 13

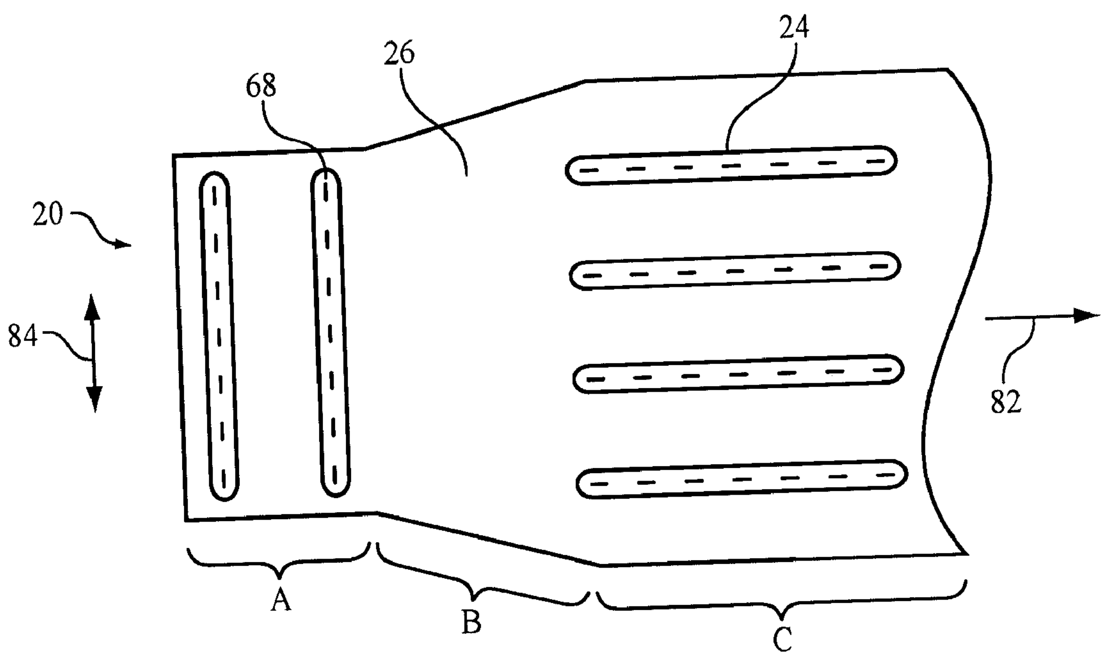


FIG. 13A

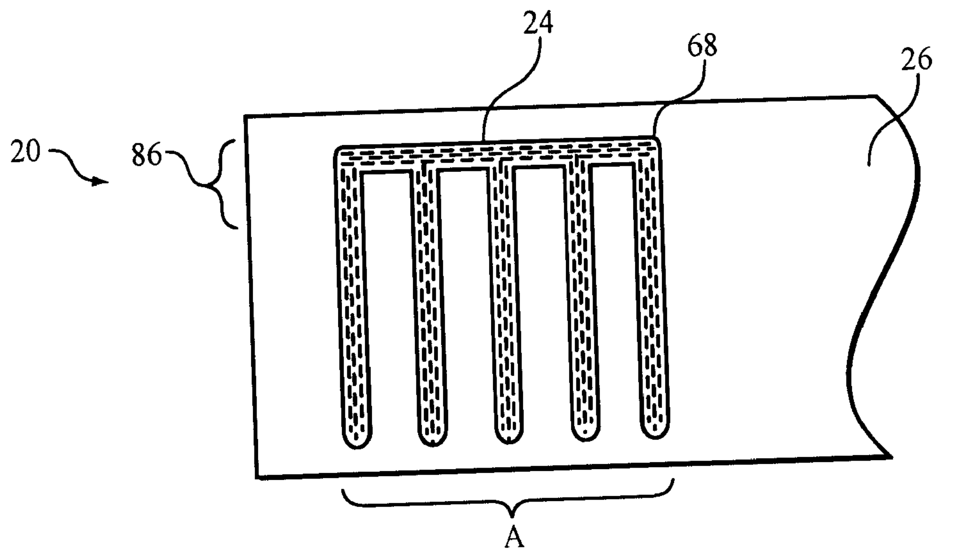


FIG. 14

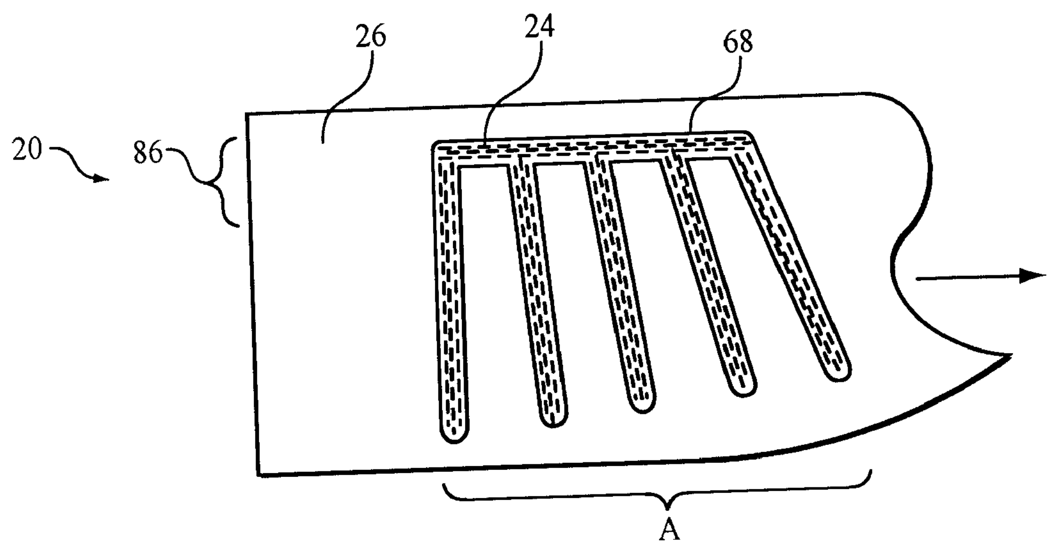


FIG. 14A

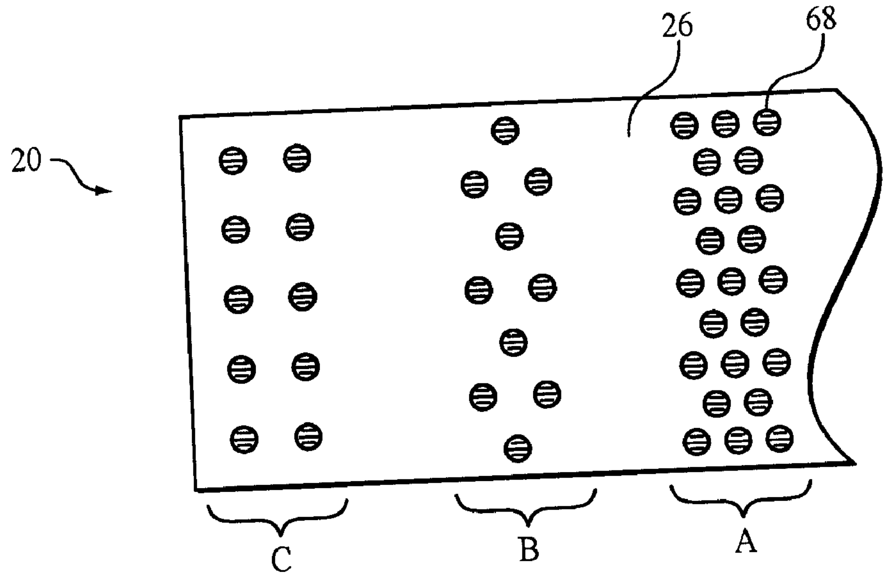


FIG. 15

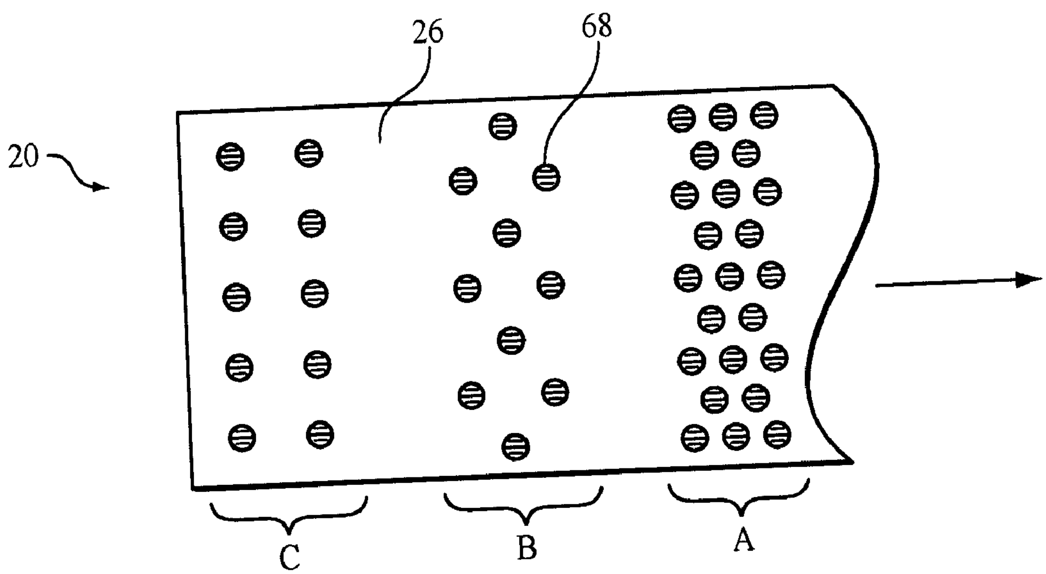


FIG. 15A

ELASTIC FASTENING SYSTEM

TECHNICAL FIELD

[0001] This invention relates to hook and loop fasteners.

BACKGROUND

[0002] A number of fastening systems, such as diaper fastening systems, incorporate a hook and loop system for easy fastening and release. The hook component typically includes a flat plastic sheet laminate with a number of protruding hooks that engage with a number of loops on a corresponding loop component.

[0003] Current diaper fastening systems incorporate a non-elastic hook backing attached to a stretchable ear tab laminate. In a fastened state, this hook component is secured to a loop component on a corresponding end of the product. The loop component typically lacks any significant elastic properties as well. When the infant's body flexes, specifically when the abdomen and hip circumference increases, the fastening system responds with the elongation of the stretchable ear tab component. When the elastic tensioned response of the tab equals the ultimate shear fastening strength of the hook and loop, the product fails with a fastening "pop-open."

[0004] There is a need or desire for a hook and loop fastening system designed to provide fastening security while being stretched.

SUMMARY

[0005] The present invention is directed to a hook and loop fastening system wherein both a hook component and a loop component can have elastic properties. The composite elastic fastening system can be designed to elongate to the wearer's maximum product straining level without significant local hook/loop failure. The elongation occurs in the elasticized backing portions of the hook and loop components.

[0006] The backing of the hook component can be an elastic nonwoven, or an elastic laminate, with the hooks protruding from the web or laminate. The hook backing can stretch in a transverse direction, or biaxially. The loop component can also be nonwoven with similar elastic properties. By providing stretch in the transverse direction of the hook portion, with strips or rows of hooks running in the longitudinal direction, the amount of energy absorbed by the system before disengaging is increased. Furthermore, pleats or hinges or creping can be located between the strips of hooks, thereby optimizing the stretch and recovery of the web. The elastic hook and loop fastening system is particularly suitable for use in absorbent articles.

[0007] With the foregoing in mind, various aspects of the invention provide a hook and loop fastening system wherein the hook component and the loop component can yield or extend, thus avoiding disengagement.

[0008] In an aspect, the invention features a hook and loop fastener that includes a hook component and a loop component. The hook component has a hook backing and a plurality of hooks protruding from the hook backing. The hook backing includes an extensible material. The loop component includes a loop backing and a plurality of loops protruding from it. The loop backing also includes an extensible material.

[0009] Implementations of this aspect may include one or more of the following features. For example, the plurality of hooks are aligned in at least two rows. The extensible material includes pleats parallel to the rows of hooks, the pleats located between the rows of hooks.

[0010] In some embodiments, the hook component further comprises a strip of material between at least some of the hooks and the hook backing. In some cases, the strips of material are co-formed with the hooks. In some cases, the strips of material can be stretchable in a longitudinal direction and the hook backing is biaxially stretchable.

[0011] In some embodiments, the hook backing and/or the loop backing includes an elastic nonwoven web.

[0012] The hook and/or loop backing, in some embodiments, includes an elastic woven web.

[0013] In some cases, the hook backing and/or loop backing includes a neck-bonded laminate.

[0014] In some embodiments, the hook backing can be stretched between about 50% and about 200%, between about 70% and about 170% and between about 100% and about 150%.

[0015] In some cases, the extensible material is creped.

[0016] In another aspect, the invention features a hook component including an extensible, sheet-form substrate having first and second regions and a multiplicity of spaced-apart resin bases disposed on a front side of the substrate. The spaced-apart resin bases have integrally molded stems extending therefrom. The bases in the first region are arranged to provide different overall extensibility than in the second region.

[0017] Implementations may include one or more of the following features. For example, the resin bases are non-contiguous with each other.

[0018] In some embodiments, the resin bases are arranged to form areas of the substrate having asymmetric extensibility.

[0019] In some cases, the bases extend in discrete, longitudinal and/or transverse rows.

[0020] The bases, in some cases, form spaced-apart patches of hooks.

[0021] In some embodiments, the extensible material is biaxially extensible having an extensibility in a first direction and a second direction, perpendicular to the first direction. In some cases, the bases are arranged to limit the level of extensibility of the extensible substrate more in one of the first and second directions than the other direction in the first region. In some cases, the bases are arranged to limit the level of extensibility of the extensible substrate in both the first and second directions in the first region.

[0022] In some embodiments, the base portions are substantially non-extensible.

[0023] The hook component, in some cases, includes at least two regions having different extensibilities.

[0024] In some embodiments, the hook backing includes an elastic nonwoven web, an elastic woven web and/or a neck-bonded laminate.

[0025] In some embodiments, the hook backing can be stretched between about 50% and about 200%, between about 70% and about 170% and between about 100% and about 150%.

[0026] In yet another aspect, the invention features a hook and loop fastener including a hook component having an extensible, sheet-form substrate having first and second regions and a multiplicity of spaced-apart resin bases disposed on a front side of the substrate. The spaced-apart resin bases have fastener elements that include stems extending outwardly from and integrally molded with the resin bases. The bases in the first region are arranged to provide different overall extensibility than in the second region. The hook and loop fastener also includes a loop component including an extensible loop backing and a plurality of loops protruding therefrom. The loops of the loop component sized to engage the fastener elements of the hook component.

[0027] Implementations may include one or more other features. For example, the extensible loop backing includes spaced-apart material disposed on a broad surface of the loop backing. In some cases the spaced-apart material disposed on the broad surface of the loop backing is arranged to provide different overall extensibility in a first region than in a second region. In some cases, fastener elements disposed in the first region of the hook component are engaged with loops in the first region of the loop component.

[0028] In some embodiments, at least one of the extensible sheet-form substrate and the extensible loop backing are biaxially extensible having an extensibility in a first direction and a second direction, perpendicular to the first direction.

[0029] In some cases, the substrate and/or the loop backing includes an elastic nonwoven web.

[0030] The sheet-form substrate and/or loop backing, in some embodiments, includes an elastic woven web.

[0031] In some cases, the sheet-form substrate and/or loop backing includes a neck-bonded laminate.

[0032] In some embodiments, the sheet-form substrate can be stretched between about 50% and about 200%, between about 70% and about 170% and/or between about 100% and about 150%.

[0033] In another aspect, the invention features a method of forming a hook and loop fastener product including providing a sheet-form extensible first substrate having first and second regions; attaching a multiplicity of spaced-apart resin bases on a front side of the substrate in the first region, the spaced-apart resin bases having fastener elements including stems extending outwardly from and integrally molded with the resin bases, to provide different overall extensibility in the first region than in the second region; and engaging the fastener elements with matable elements extending from a second substrate.

[0034] Implementations may include one or more of the following features. For example, the matable elements are loops and/or nonwoven fibers.

[0035] In some embodiments, the second substrate is extensible. In some cases, the second substrate is biaxially extensible having an extensibility in a first direction and a second direction, perpendicular to the first direction. In some cases, the method includes attaching a multiplicity of discrete, spaced-apart material on a broad surface of the second substrate in a first region to provide a different overall extensibility in the first region relative to a second region of the second substrate.

[0036] In some embodiments, the resin bases are noncontiguous with each other.

[0037] In some cases, the resin bases are arranged to form areas of the substrate having asymmetric extensibility.

[0038] Implementations of any of the foregoing aspects may include one or more of the following features. For example, the hooks include heads that are hook-shaped overhanging the hook backing in one or more discrete directions.

[0039] In some cases, the hooks include heads that are mushroom-shaped overhanging the hook backing in multiple directions.

[0040] Aspects may be included in an absorbent article, a diaper, a training pant, a feminine hygiene product, an incontinence product and/or a medical garment.

[0041] Embodiments of the invention may have one or more of the following advantages. The extensibility of the hook backing and or loop backing can be tailored to a particular application by varying the extensible material. The extensible material can be monoaxially or biaxially extensible.

[0042] In some cases, the extensibility of the extensible material can be altered/controlled by attaching a less extensible material to a surface of the extensible material. Where less extensible material is attached to the surface of the extensible material (e.g., the hook backing or substrate), the less extensible material can be arranged to limit the extensibility in a particular region more than the extensibility in another region. Also, in embodiments including a biaxially extensible material, the extensibility can be reduced more in one direction, than in another direction. By controlling the extensibility, an extensible material can be used in a wider variety of applications, for example, where less extensibility is needed, in a particular application. This includes applications where it is desirable to have an extensible fastener component that is more extensible in one region than in another region.

[0043] In some cases, arrangement of the less extensible material on the surface of the extensible material produces various stretching modes. For example, if little or no extensibility is desired in the transverse direction, transversely extending rows of less extensible material can be attached to the substrate. The transversely extending rows of less extensible material can act like beams that greatly reduce the substrate's extensibility in the transverse direction.

[0044] In some embodiments, it may also be desirable to create asymmetric extensibility within a particular region of the extensible material. For example, within a region, certain sections of the extensible material can have a different extensibility than other sections within the region by arranging the less extensible material accordingly.

[0045] In some cases, the fastening system can be designed to elongate to the wearer's maximum product straining level without significant local hook/loop failure. This is because by providing stretch in the transverse direction of the hook portion, with strips or rows of hooks running in the longitudinal direction, the amount of energy absorbed by the system before disengaging is increased.

[0046] The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0047] **FIG. 1** is a transverse view of a hook component and a loop component engaged with one another.

[0048] **FIG. 2** is a longitudinal view of a hook component and a loop component engaged with one another.

[0049] **FIG. 3** is a graph showing the benefits of a hook and loop fastening system having elastic properties compared to a non-elastic hook and loop fastening system.

[0050] **FIG. 4** is a longitudinal view of an individual hook of a hook component having a J-shaped engagement portion.

[0051] **FIG. 5** is a longitudinal view of an individual hook of a hook component having a flat-top engagement portion.

[0052] **FIG. 6** is a transverse view of an individual hook of a hook component having a flat-top engagement portion.

[0053] **FIG. 7** is a plan view of a diaper in a stretched flat state, showing the surface of the diaper that faces away from the wearer when the diaper is worn.

[0054] **FIG. 8** is a top view of a hook component.

[0055] **FIG. 9** is a side view of a hook component.

[0056] **FIG. 10** is a transverse view of a hook component having pleats between rows of hooks.

[0057] **FIGS. 11 and 11**A are top views of a hook component in unstretched and stretched conditions, respectively.

[0058] **FIGS. 12 and 12**A are top views of another hook component in unstretched and stretched conditions, respectively.

[0059] **FIGS. 13 and 13**A are also top views of another hook component in unstretched and stretched conditions, respectively.

[0060] **FIGS. 14 and 14**A are also top views of another hook component in unstretched and stretched conditions, respectively.

[0061] **FIGS. 15 and 15**A are also top views of another hook component in unstretched and stretched conditions, respectively.

[0062] Like reference symbols in the various drawings indicate like elements.

DEFINITIONS

[0063] Within the context of this specification, each term or phrase below will include the following meaning or meanings.

[0064] "Biaxially stretchable" and "biaxial elastic stretch" refer to stretchability in two directions perpendicular to one another, e.g. stretchability in a longitudinal direction and in a transverse direction.

[0065] "Bonded" refers to the joining, adhering, connecting, attaching, entangling, embedding, or the like, of two elements. Two elements will be considered to be bonded together when they are bonded directly to one another or indirectly to one another, such as when each is directly bonded to intermediate elements.

[0066] "Creped" or "Crepe" refers to a material or composite having bonded and unbonded areas, in which the bonded areas are bent out-of-plane and the unbonded portions are looped, such that the creped material cannot be returned to its original uncreped state by applying a mechanical stress, but can be stretched or extended by applying a mechanical stress.

[0067] "Elastic,""elasticized" and "elasticity" mean that property of a material or composite by virtue of which it tends to yield to a force and recover to approximately its original size and shape after removal of a force.

[0068] "Extensible" or "stretchable" means that a material can be stretched, without breaking, by at least 50% (to at least 150% of its initial (unstretched) length) in at least one direction, suitably by at least 70% (to at least 170% of its initial length), desirably by at least 100% (to at least 200% of its initial length). The term includes elastic materials as well as materials that stretch but do not significantly retract.

[0069] "Longitudinal" and "transverse" have their customary meaning, as indicated by the longitudinal and transverse axes depicted in **FIG. 7**. The longitudinal axis lies in the plane of the article and is generally parallel to a vertical plane that bisects a standing wearer into left and right body halves when the article is worn. The transverse axis lies in the plane of the article generally perpendicular to the longitudinal axis. The article as illustrated is longer in the longitudinal direction than in the transverse direction.

[0070] "Maximum product straining level" refers to a maximum amount of force, or stretching, that can be endured by a product without the product tearing or becoming completely unfastened.

[0071] "Necked" or "neck-stretched" interchangeably refer to a method of elongating a nonwoven fabric, generally in the longitudinal, or machine direction, to reduce its width in a controlled manner to a desired amount. The controlled stretching may take place under cool, room temperature or greater temperatures and is limited to an increase in overall dimension in the direction being stretched up to the elongation required to break the fabric, which in most cases is about 1.2 to 1.4 times. When relaxed, the web retracts toward its original dimensions. Such a process is disclosed, for example, in U.S. Pat. No. 4,443,513 to Meitner and Notheis, U.S. Pat. Nos. 4,965,122, 4,981,747 and 5,114,781 to Morman and U.S. Pat. No. 5,244,482 to Hassenboehler Jr. et al.

[0072] "Neck bonded laminate," or NBL, conventionally refers to a composite material having at least two layers in which one layer is a necked, non-elastic layer and the other layer is an elastic layer. The layers are joined together when the non-elastic layer is in an extended condition.

[0073] "Partial failure shear tension" refers to a level of shear tension sufficient to disengage a certain fraction of hooks and loops of a hook and loop fastener.

[0074] "Peel force" refers to a force that tends to pull two adjoining bodies away from one another in opposite directions generally perpendicular to a plane in which the bodies are joined.

[0075] "Personal care garment" includes diapers, training pants, swim wear, absorbent underpants, adult incontinence products, feminine hygiene products, medical garments, and the like. The term "medical garment" includes medical (i.e., protective and/or surgical) gowns, caps, gloves, drapes, face masks, blood pressure cuffs, bandages, veterinary products, mortuary products, and the like.

[0076] "Pleats" refer to folds in material wherein the material is doubled upon itself and kept in place by pressing, stitching or any other suitable methods. The pleats allow the material to be stretched or extended when a mechanical force is applied thereto.

[0077] "Polymers" include, but are not limited to, homopolymers, copolymers, such as for example, block, graft, random and alternating copolymers, terpolymers, etc. and blends and modifications thereof. Furthermore, unless otherwise specifically limited, the term "polymer" shall include all possible geometrical configurations of the material. These configurations include, but are not limited to isotactic, syndiotactic and atactic symmetries.

[0078] "Releasably attached,""releasably engaged" and variations thereof refer to two elements being connected or connectable such that the elements tend to remain connected absent a separation force applied to one or both of the elements, and the elements being capable of separation without substantial permanent deformation or rupture. The required separation force is typically beyond that encountered while wearing the absorbent garment.

[0079] "Shear fastening strength" refers to a fastener's ability to withstand shear tension, or shear fastening force, between corresponding fastener components.

[0080] "Shear tension" and "shear fastening force" refer to forces that tend to produce an opposite but parallel sliding motion between two bodies' planes. Shear forces tend to pull two adjoining bodies away from one another in opposite directions generally parallel to a plane in which the bodies are joined.

[0081] "Thermoplastic" describes a material that softens when exposed to heat and which substantially returns to a non-softened condition when cooled to room temperature.

[0082] These terms may be defined with additional language in the remaining portions of the specification.

DETAILED DESCRIPTION

[0083] Referring to **FIGS. 1 and 2**, a hook and loop fastening system **48** is designed to buffer or conform to product stresses during wear. The fastening system utilizes a hook component **20** and a loop component **22** each having elastic properties.

[0084] This hook and loop fastening system **48** is particularly suitable for use on disposable absorbent articles. Examples of such suitable articles include diapers, training pants, feminine hygiene products, incontinence products, other personal care or health care garments, including medical garments, or the like.

[0085] As shown in **FIGS. 1 and 2**, a hook component **20** and a loop component **22** can be brought together to be releasably attached, or releasably engaged, to one another. The hook component **20** has a number of individual hooks **24** protruding generally perpendicularly from a hook backing **26**. The hook backing **26** includes an elastic material, thereby enabling the hook component **20** to stretch in response to shear fastening force. Similarly, the loop component **22** has a number of individual loops **28** protruding generally perpendicularly from a loop backing **30**, and the loop backing **30** includes an elastic material, thereby enabling the loop component **22** to stretch in response to shear fastening force.

[0086] The individual hooks **24** and the individual loops **28**, when brought into contact with one another, engage with one another, with the hooks **24** latching onto the loops **28**. The hooks **24** and loops **28** can be forcibly separated by pulling on either component **20**, **22** using peel force. When a product deforms due to wear, the elastic properties of the hook component **20** and the loop component **22** absorb tension by elongating, thereby minimizing disengagement.

[0087] The graph in **FIG. 3** shows a general comparison between a non-elastic coupling **50**, a piece of elastic **54**, and the integrated system **48**, in terms of the distance each can extend in response to applied force. More particularly, as demonstrated by the graph in **FIG. 3**, the non-elastic coupling **50** between a hook component and a loop component cannot extend very far in response to applied shear force. The area designated by the reference numeral **52** shows where individual hooks or rows of hooks on the non-elastic coupling **50** become disengaged. In the non-elastic coupling **50**, hook disengagement occurs all at once, thus the fastening components become unfastened after very little elongation. In contrast, the piece of elastic **54**, not including a fastening component, can extend a great deal in response to applied shear force. Once the piece of elastic **54** reaches the maximum applied shear force that it can withstand, the elastic **54** breaks, as shown at point **56** in **FIG. 3**. The integrated system **48** is a combination of a hook component and a loop component each having elastic properties. The integrated system **48** is shown to be able to extend a great deal in response to applied shear force, relative to the non-elastic coupling **50**. The areas designated by the reference numeral **58** show where individual hooks or rows of hooks become disengaged through failure shear tension, but as shown in **FIG. 3**, the elastic fastening system **48** is able to remain fastened even after several hooks and/or rows of hooks become disengaged, until finally, under increasing applied shear force, the integrated fastening system **48** eventually becomes completely unfastened. Furthermore, re-engagement of the hooks and loops can occur when the shear tension is decreased, such that the level of extension can move to the left along the x-axis in **FIG. 3**. Before the integrated fastening system **48** becomes unfastened, not only can the system **48** withstand a great deal of force, but it can also withstand considerable elongation. Therefore, when applied to an absorbent article, for example, the elastic fastening system **48** can be designed such that any foreseeably applied shear tension would not reach levels near the failure shear tension of the system **48**. The shear stress foreseeably exerted on the fastening system **48** while in use is complementary to the amount of stress the fastening system **48** can withstand. In other words, the fastening system **48** includes a hook backing **26** and a loop backing **30** each having enough elasticity to elongate to a wearer's maximum product straining level without significant local hook/loop failure. The elasticity of the hook component **20** is attributable to elastic behavior of the hook backing **26**. Unlike the hook backing **26**, the individual hooks **24** have enough strength to remain engaged under tension.

[**0088**] Suitably, the hook backing **26** and loop backing **30** can each extend between about 50% and 200%, more suitably between about 70% and 170%, most suitably between about 100% and 150%. Desirably, the hook component **20** and the loop component **22** have equal strength and equal extensibility.

[**0089**] Virtually any hook shape can be used with the hook component **20**. Suitably, the individual hooks **24** have an engagement portion **38** at a free end **40** of each hook **24**. The engagement portion **38** can be J-shaped (**FIG. 4**), or a flat top (**FIGS. 5 and 6**), or any other suitable shape. A hook **24** having a J-shaped engagement portion **38** is shown in **FIG. 4** in a longitudinal direction. The flat-top hook **24** shown in **FIGS. 5 and 6** has a rounded engagement portion **38** with a flat top and can look the same in the longitudinal direction (**FIG. 5**) as in the transverse direction (**FIG. 6**), in which case a base portion **42** of the hook **24** is suitably round or square as viewed from above. Alternatively, the base portion **42** of the hook **24** can be oblong, rectangular, triangular, or any other suitable shape.

[**0090**] The longitudinal direction is indicated by an arrow **44** in **FIGS. 2, 4** and **5**. The term "transverse direction" refers to a direction perpendicular to the longitudinal direction. The transverse direction is indicated by an arrow **46** in **FIGS. 1 and 6**. In terms of a pant-like absorbent garment, the transverse direction of each fastening component located along a side of the garment is in a direction parallel to the wearer's waistline. Thus, the longitudinal direction of a fastening component on a pant-like absorbent garment is in a direction parallel to a wearer's backbone. For example, a diaper **60** including the fastening system **48** is shown in a stretched flat state, showing the surface of the diaper **60** that faces away from the wearer when the diaper **60** is worn, in **FIG. 7**, with arrow **44** indicating the longitudinal direction and arrow **46** indicating the transverse direction.

[**0091**] With reference to the diaper **60** in **FIG. 7**, the hook backing **26** attached to the diaper **60** is suitably stretchable in the transverse direction to adjust for expansion and contraction of the wearer's abdomen and hip circumference as the wearer's body flexes. If the hook backing **60** would not stretch, at least in the transverse direction, then the hook component **20** and the loop component **22** would be likely to become unfastened under shear forces exerted by the wearer's body as the body deforms the product. Therefore, both the hook backing **26** and the loop backing **30** of the fastening system **48** are suitably stretchable in the transverse direction or the longitudinal direction. Furthermore, the hook backing **26** and the loop backing **30** can be biaxially stretchable, thereby accommodating the wearer's body's movements in the transverse direction as well as the longitudinal direction. Areas **62** representing transverse stretchability in the hook backing **26** and the loop backing **30** are shown in **FIG. 1**. Similarly, areas **64** representing longitudinal stretchability in the hook backing **26** and the loop backing **30** are shown in **FIG. 2**.

[**0092**] To further enhance the transverse stretch of the hook component **20**, the individual hooks **24** may be embedded discontinuously in the hook backing **26**. For example, the hooks **24** can be arranged in rows **66** on the hook backing **26**, as shown in **FIG. 8**. The rows **66** are suitably parallel to the longitudinal direction, thereby not obstructing transverse stretch. Furthermore, the rows **66** of individual hooks can be embedded in strips of material **68**, and the strips of material **68** can be bonded to the hook backing **26**. Preferably, the strips of material **68** are bonded to the hook backing **26** using an adhesive, for example an elastomeric adhesive such as Findley H2525A, H2525 or H2096 of Findley Adhesives, Inc., of Wauwatosa, Wis. Other bonding means well known to those having ordinary skill in the art may also be used to bond the strips of material **68** to the hook backing **26**, including thermal bonding, ultrasonic bonding, and the like. **FIG. 9** is a side view of **FIG. 8** showing, more clearly, the strips of material **68** bonded to the hook backing **26**. The strips of material **68** need not be stretchable in order to achieve the shear fastening strength resistance of the fastening system **68**, but can be stretchable. More particularly, if the hook backing **26** is biaxially stretchable, then the strips of material **68** are suitably stretchable in at least the longitudinal direction.

[**0093**] In one embodiment, the hook component **20** includes at least two rows **66** of hooks **24** embedded in the hook backing **26**, the rows **66** being parallel to the longitudinal direction. Between the rows **66**, the hook backing **26** contains pleats **70**, as shown in **FIG. 10**. These pleats **70** provide room for additional transverse direction expansion, in addition to the transverse stretch of the elastic hook backing **26**. Methods of pleating materials are well-known in the art. The rows **66** of hooks **24** in this embodiment can either be attached to strips of material **68**, which are then attached to the hook backing **26**, or can be directly embedded in the hook backing material **26** to effectively create islands of hooks.

[**0094**] As noted above, rows of hooks **24** can be provided to facilitate stretching in the transverse direction. Also, groups of hooks **24** extending from strips of material **26** can be provided to facilitate a variety of stretching modes. Referring to **FIG. 11**, a hook component **20** is provided having material **68** that is attached to a biaxially extensible hook backing **26**. The material **68** includes hooks **24** that extend from a surface of the material **68**. The material **68** is preferably less extensible than the hook backing **26**, as an example, the material is relatively non-extensible. As illustrated in **FIG. 11A**, when a force is applied in the direction indicated by arrow **82**, the hook backing **26** extends. However, the amount of extension of the hook backing is affected by the less-extensible strips of material.

[**0095**] In region A, the hook component **20** is comparatively less extensible because the hook backing **26** is more dominated by the less-extensible material **68**. In region B, the hook component is most extensible because the region includes no strips of material. In region C, the hook backing has an intermediate amount of extensibility because is it less dominated by the relatively non-extensible hook backing **26** compared to region A.

[0096] Referring now to **FIG. 12**, strips of material **68** are arranged to facilitate stretching in longitudinal and transverse directions. Region A contains strips of material **68** that extend in substantially parallel rows across the extensible hook backing **26**. Where the strips **68** are substantially non-extensible, the rows act like beams that prevent extension of the substrate in the transverse direction forming a monoaxially extensible region. By contrast, region B contains strips of material that arranged in discrete, spaced-apart patches that allow extension of the hook backing in both the longitudinal and transverse directions.

[0097] Referring now to **FIG. 12A**, when forces are applied in the directions indicated by arrows **82** and **84**, the hook backing extends. In region A, because the hook material is arranged in parallel rows that extend across the hook backing, the backing extends in the longitudinal direction (indicated by arrow **82**). However, the hook backing in region A extends less in the transverse direction (indicated by arrow **84**) due to the less-extensible material **68** that is arranged in transverse, parallel rows. In region B, the hook backing extends in both the transverse and longitudinal directions. This is because the less-extensible patches of material interferes less with the extension of the hook backing in both the transverse and longitudinal directions.

[0098] In a variation, illustrated by **FIG. 13**, a hook component **20** has a region A of longitudinal extensibility and a region C of transverse extensibility. Between regions A and C is a transition region B. In region A, material **68** that is less extensible than hook backing **26** is arranged in transverse rows allowing for longitudinal extensibility. In region C, the less extensible strips of material **68** are arranged in longitudinal rows allowing for transverse extensibility. As indicated by **FIG. 13A**, like the hook component of **FIG. 12**, the transverse rows of strips **68** interfere substantially with the extension of the hook backing in the transverse direction (indicated by arrow **84**) within region A. Similarly, the longitudinal rows of strips **68** interfere substantially with the extension of the hook backing **26** in the longitudinal direction (indicated by arrow **82**) within region C.

[0099] Although hook backing **26** is biaxially extensible, in regions A and C, the hook component is relatively monoaxially extensible due to the arrangement of the material **68**. In region A, the hook component **20** extends in the longitudinal direction. In region C, the hook component extends transversely. Between region A and region C is transition region B that is biaxially extensible. Transition region B provides a transition from region A to the wider, extended region C.

[0100] Referring now to **FIG. 14**, another hook component **20** is provided that includes less-extensible material **68**. The material **68** is shaped to manipulate the extensibility of a biaxially extensible hook backing **26** in both the longitudinal and transverse directions within region A to create a region of asymmetric extensibility having an asymmetrical variance of longitudinal extensibility across the width of the hook component. Referring to **FIG. 14A**, the longitudinal extensibility of the hook component within region A changes across the width (i.e., in the transverse direction) of the hook component. Within section **86** of region A, the hook component **20** is relatively inextensible in the longitudinal direction due to the longitudinal beam **88** of material **68**. Moving outwardly from the longitudinal beam in the transverse direction, the longitudinal extensibility of the hook backing increases. Also, within region A, the hook component of **FIGS. 13 and 13**A is relatively inextensible in the transverse direction due to the transversely extending rows **90** of material **68** acting as beams. This is because the transverse rows **90** of material **68** interfere substantially with the extension of the hook backing in the transverse direction within the region.

[0101] Referring now to **FIGS. 15 and 15**A, less-extensible strips of material **68** are used to manipulate extensibility of a hook backing **26**. Within region A, the strips of material are attached to the hook backing in a relatively dense arrangement, thus reducing the level of extensibility to near the extensibility level of the strips **68** (see **FIG. 15A**). Within region B, the arrangement of the strips **68** is less dense. As a result, region B of the hook component is more extensible than region A (see **FIG. 15A**). Similarly, region C has the lowest strip density and therefore has the highest level of longitudinal extensibility (see **FIG. 15A**).

[0102] Arrangement of the strips of material can be used to manipulate extensibility in a hook and loop fastening system. This can be accomplished by arranging less-extensible material on an extensible hook backing, as described above, or the material can be attached to extensible loop backing. Also, less-extensible material can be attached to both hook and loop extensible backings to form regions of the hook and loop system having particular stretching modes based on the arrangement of the less-extensible material. Regions of hook and loop backing having the less-extensible material can also cooperate to further manipulate the extensibility of the hook and loop system within a particular region. For example, a hook backing having a region including less-extensible material can overlap a loop backing region having less-extensible material. Although each of the hook and loop backings have a particular stretching mode due to a material arrangement, when hook components are engaged with loop components within the regions, the stretching modes cooperate to form a system stretching mode within the region.

[0103] A number of backing material can be employed. Instead of pleats **70**, the hook backing material **26** can be creped, thereby providing room for additional transverse direction expansion. One technique of creping is taught, for example, in U.S. Pat. No. 4,810,556, issued to Kobayashi et al., hereby incorporated by reference. Essentially, the creping process involves coating a nonwoven fabric with a lubricant and then pressing the coated fabric between a drive roll and a plate having a rough sandpaper-like surface. The nonwoven fabric is crinkled in a wavelike fashion in the direction of movement of the fabric by the frictional force caused by the pressing.

[0104] The hook components **20** generally have between about 16 and about 620 hooks per square centimeter, suitably between about 124 and about 388 hooks per square centimeter, desirably between about 155 and about 310 hooks per square centimeter. The hooks **24** suitably have a height of from about 0.00254 centimeter (cm) to about 0.19 cm, suitably from about 0.0381 cm to about 0.0762 cm.

[0105] The hooks **24** are suitably molded or extruded from a thermoplastic polymer selected from polyamides, polyesters, polyolefins (e.g. polypropylene or polyethylene) or another suitable material. Likewise, the hook backing material **26**, in addition to an elastic component described below, can be made of any of these or any other suitable materials since the hooks **24** and the hook backing **26** are generally produced from the same material in one process. Alternatively, the hooks **24** and the strips of material **68** can be co-formed from any of the listed materials, and the strips of material **68** can then be attached to an elastic hook backing material **26**. The hook backing material **26** generally has a thickness in a range of between about 0.5 millimeter (mm) and about 5 mm, suitably in a range of between about 0.8 mm and 3 mm, with a basis weight in a range of from about 20 grams per square meter to about 70 grams per square meter. As mentioned, the hooks **24** can be spatially arranged in rows **66** or any other suitable discontinuous configuration on the hook backing **26**.

[0106] Materials suitable for use in preparing the elastic hook backing **26** and the elastic loop backing **30** include diblock, triblock, tetrablock or other multi-block elastomeric copolymers such as olefinic copolymers, including styrene-isoprene-styrene, styrene-butadiene-styrene, styrene-ethylene/butylene-styrene, or styrene-ethylene/propylene-styrene, which may be obtained from the Shell Chemical Company, under the trade designation KRATON® elastomeric resin; polyurethanes, including those available from E. I. Du Pont de Nemours Co., under the trade name LYCRA® polyurethane; polyamides, including polyether block amides available from Ato Chemical Company, under the trade name PEBAX® polyether block amide; polyesters, such as those available from E. I. Du Pont de Nemours Co., under the trade name HYTREL® polyester; and single-site or metallocene-catalyzed polyolefins having density less than about 0.89 grams/cc, available from Dow Chemical Co. under the trade name AFFINITY®.

[0107] A number of block copolymers can be used to prepare the elastic hook backing **26** and the elastic loop backing **30**. Such block copolymers generally comprise an elastomeric midblock portion B and a thermoplastic endblock portion A. The block copolymers may also be thermoplastic in the sense that they can be melted, formed, and resolidified several times with little or no change in physical properties (assuming a minimum of oxidative degradation).

[0108] Endblock portion A may comprise a poly(vinylarene), such as polystyrene. Midblock portion B may comprise a substantially amorphous polyolefin such as polyisoprene, ethylene/propylene polymers, ethylene/butylene polymers, polybutadiene, and the like, or mixtures thereof.

[0109] Suitable block copolymers include at least two substantially polystyrene endblock portions and at least one substantially ethylene/butylene mid-block portion. A commercially available example of such a linear block copolymer is a styrene-ethylene/butylene-styrene block copolymer, available from the Shell Chemical Company, under the trade designation KRATON® G1657 elastomeric resin. Typical properties of KRATON® G1657 elastomeric resin are reported to include a tensile strength of 3400 pounds per square inch (2×10^6 kilograms per square meter), a 300 percent modulus of 350 pounds per square inch (1.4×10^5 kilograms per square meter), an elongation of 750 percent at break, a Shore A hardness of 65, and a Brookfield viscosity, when at a concentration of 25 weight percent in a toluene solution, of about 4200 centipoise at room temperature. Another suitable elastomer, KRATON® G2746, is a styrene butadiene block copolymer blended with tackifier and low density polyethylene.

[0110] Other suitable elastomeric polymers may also be used to make the elastic hook backing **26** and the elastic loop backing **30**. These include, without limitation, elastomeric (single-site or metallocene catalyzed) polypropylene, polyethylene and other alpha-olefin homopolymers and copolymers, having density less than about 0.89 grams/cc; ethylene vinyl acetate copolymers; and substantially amorphous copolymers and terpolymers of ethylene-propylene, butene-propylene, and ethylene-propylene-butene.

[0111] Single-site catalyzed elastomeric polymers (for example, constrained geometry or metallocene-catalyzed elastomeric polymers) are relatively new, and are presently preferred. The single-site process for making polyolefins uses a single-site catalyst which is activated (i.e., ionized) by a co-catalyst.

[0112] Polymers produced using single-site catalysts have a narrow molecular weight distribution. "Narrow molecular weight distribution polymer" refers to a polymer that exhibits a molecular weight distribution of less than about 3.5. As is known in the art, the molecular weight distribution of a polymer is the ratio of the weight average molecular weight of the polymer to the number average molecular weight of the polymer. Methods of determining molecular weight distribution are described in the *Encyclopedia of Polymer Science and Engineering*, Volume 3, Pages 299-300 (1985). Polydispersities (M_w/M_n) of below 3.5 and even below 2 are possible for single-site produced polymers. These polymers also have a narrow short chain branching distribution when compared to otherwise similar Ziegler-Natta produced polymers.

[0113] It is also possible to use a single-site catalyst system to control the isotacticity of the polymer quite closely when stereo selective metallocene catalysts are employed. In fact, polymers have been produced having an isotacticity in excess of 99 percent. It is also possible to produce highly syndiotactic polypropylene using this system.

[0114] Commercial production of single-site catalyzed polymers is somewhat limited but growing. Such polymers are available from Exxon Chemical Company of Baytown, Tex. under the trade name EXXPOL® for polypropylene based polymers and EXACT® for polyethylene based polymers. Dow Chemical Company of Midland, Mich. has polymers commercially available under the name ENGAGE®. These materials are believed to be produced using non-stereo selective single-site catalysts. Exxon generally refers to their single-site catalyst technology as metallocene catalysts, while Dow refers to theirs as "constrained geometry" catalysts under the name INSITE® to distinguish them from traditional Ziegler-Natta catalysts which have multiple reaction sites. Other manufacturers such as Fina Oil, BASF, Amoco, Hoechst and Mobil are active in this area and it is believed that the availability of polymers produced according to this technology will grow substantially in the next decade.

[0115] Regarding single-site catalyzed elastomeric polymers, U.S. Pat. No. 5,204,429 to Kaminsky et al. describes a process which may produce elastic copolymers from cycloolefins and linear olefins using a catalyst which is a stereorigid chiral metallocene transition metal compound and an aluminoxane. The polymerization is carried out in an inert solvent such as an aliphatic or cycloaliphatic hydrocarbon such as toluene. The reaction may also occur in the gas phase using the monomers to be polymerized as the solvent. U.S. Pat. Nos. 5,278,272 and 5,272,236, both to Lai et al., assigned to Dow Chemical and entitled "Elastic Substantially Linear Olefin Polymers" describe polymers having particular elastic properties. Dow also commercially produces a line of elastomeric polyolefins under the trade name ENGAGE®.

[**0116**] The hook backing **26** and the loop backing **30** may also contain blends of elastic and inelastic polymers, or of two or more elastic polymers, provided that the blend exhibits elastic properties. Other suitable backing materials include films, stranded materials and "point unbonded" materials. Point unbonded materials are fabrics having continuous thermally bonded areas defining a plurality of discrete unbonded areas and are described in greater detail in U.S. Pat. No. 5,858,515 issued Jan. 12, 1999 to Stokes, et al. As used herein, the term "backing" can include hooks **24** or loops **28** as an integral part of the backing material.

[**0117**] The elastic hook backing **26** and loop backing **30** materials can be elastic nonwoven webs or laminates made of any of the listed polymers. The nonwoven webs can be stretch-thermal laminate (STL), neck-bonded laminate (NBL), reversibly necked laminate, or stretch-bonded laminate (SBL) material, using a stretchable polymer or a blend thereof. "Neck bonded laminate," or NBL, conventionally refers to a composite material having at least two layers in which one layer is a necked, non-elastic layer and the other layer is an elastic layer. The layers are joined together when the non-elastic layer is in an extended condition. "Reversibly necked laminate" conventionally refers to a composite material formed from at least one layer of material that has been treated while necked to impart memory to the material so that, when a force is applied to extend the material to its pre-necked dimensions, the treated, necked portions will generally recover to their necked dimensions upon termination of the force. One form of treatment is the application of heat. "Stretch-bonded laminate," or SBL, conventionally refers to a composite material having at least two layers in which one layer is a gatherable layer and the other layer is an elastic layer. The layers are joined together when the elastic layer is in an extended condition so that upon relaxing the layers, the gatherable layer is gathered. Such a multilayer composite elastic material may be stretched to the extent that the nonelastic material gathered between the bond locations allows the elastic material to elongate. Methods of making such materials are well known to those skilled in the art and described in U.S. Pat. No. 4,663,220 issued May 5, 1987 to Wisneski et al.; U.S. Pat. No. 5,226,992 issued Jul. 13, 1993 to Morman; and European Patent Application No. EP 0 217 032 published on Apr. 8, 1987 in the names of Taylor et al.; all of which are incorporated herein by reference.

[**0118**] Techniques for neck-bonding, i.e., laminating a neckable nonwoven web to an unstretched elastic film or other layer of material, are described in U.S. Pat. No. 5,883,028, issued to Morman et al., which is incorporated by reference. The neckable nonwoven web may be a porous nonwoven material such as, for example, spunbonded web, meltblown web or bonded carded web. If the neckable material is a web of meltblown fibers, it may include meltblown microfibers. The neckable material may be made of fiber forming polymers such as, for example, polyolefins. Exemplary polyolefins include one or more of polypropylene, polyethylene, ethylene copolymers, propylene copolymers, and butene copolymers. Useful polypropylenes include, for example, polypropylene available from the Exxon Chemical Company under the trade designation Exxon 3445, and polypropylene available from Shell Chemical Company under the trade designation DX 5A09.

[**0119**] The neckable web may be a multilayer material having, for example, at least one layer of spunbonded web joined to at least one layer of meltblown web, bonded carded web or other suitable material. For example, neckable material may be a multilayer material having a first layer of spunbonded polypropylene having a basis weight from about 0.1 to about 8 ounces per square yard (osy) (about 3.4-270 grams/m^2, or gsm), a layer of meltblown polypropylene having a basis weight from about 0.1 to about 4 osy (3.4-135 gsm), and a second layer of spunbonded polypropylene having a basis weight of about 0.1 to about 8 osy (3.4-270 gsm). Alternatively, the neckable web may be a single layer of material such as, for example, a spunbonded web having a basis weight of from about 0.1 to about 10 osy (3.4-340 gsm) or a meltblown web having a basis weight of from about 0.1 to about 8 osy (3.4-270 gsm). The adjacent fibers of the web should be intermittently joined by interfiber bonding, using conventional techniques known in the art.

[**0120**] An elastic sheet may be joined to the neckable web when the latter is in the tensioned, necked state to form the neck-bonded laminate. Generally, the elastic film component of the neck-bonded laminate should be less than about 2 mils (50 microns) thick, preferably less than about 1 mil (25 microns) thick, more preferably less than about 0.5 mil (13 microns) thick, when the film and laminate are relaxed. In one embodiment, the strips of material **68** can be a neckable web and the hook backing **26** can be an elastic sheet joined to the neckable web to form a neckbonded laminate.

[**0121**] The individual loops **28** of the loop component **22** can be needled, stitched or otherwise connected to or projected through the loop backing material **30**, which can suitably be made from a nonwoven material. The individual loops **28** thus connected can be made of yarn or tow. Once the loops **28** have been formed, fibers forming the loops **28** can be anchored in place by bonding the fibers to the loop backing material **30** with heat and/or adhesives or any other suitable means. The individual loops **28** can alternatively be formed as an integral part of a fibrous nonwoven web such as a spunbond nonwoven web, or a staple fiber carded web. These nonwoven webs can be creped or crimped using processes known in the art, to form well-defined loop regions within their fiber structures. The polymers used to make the loop backing material **30** can be any of the elastic polymers listed above for the hook backing material **26**. Suitably, the same elastic polymers can be used to form the loops **28**.

[**0122**] The fastening system **48** is designed to elongate to a wearer's maximum product straining level to avoid significant hook/loop failure. The result is an elastic fastening system **48** including a hook component **20** and a loop component **22**, each having elastic properties.

[0123] It will be appreciated that details of the foregoing embodiments, given for purposes of illustration, are not to be construed as limiting the scope of this invention. Although only a few exemplary embodiments of this invention have been described in detail above, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. Accordingly, all such modifications are intended to be included within the scope of this invention, which is defined in the following claims and all equivalents thereto. Further, it is recognized that many embodiments may be conceived that do not achieve all of the advantages of some embodiments, particularly of the preferred embodiments, yet the absence of a particular advantage shall not be construed to necessarily mean that such an embodiment is outside the scope of the present invention.

1. A hook and loop fastener comprising separate hook and loop components;

the hook component including a hook backing and a plurality of hooks protruding from the hook backing, wherein the hook backing includes an extensible material; and

the loop component including a loop backing and a plurality of loops protruding from it, wherein the loop backing includes an extensible material.

2. The hook and loop fastener of claim 1, wherein the plurality of hooks are aligned in at least two rows.

3. The hook and loop fastener of claim 2, wherein the extensible material included in the hook backing includes pleats parallel to the rows of hooks, the pleats located between the rows of hooks.

4. The hook and loop fastener of claim 1, wherein the hook component further comprises a strip of material between at least some of the hooks and the hook backing.

5. The hook and loop fastener of claim 4, wherein the strips of material are co-formed with the hooks.

6. The hook and loop fastener of claim 4, wherein the strips of material are stretchable in a longitudinal direction and the hook backing is biaxially stretchable.

7. The hook and loop fastener of claim 1, wherein the hook backing comprises an elastic nonwoven web.

8. The hook and loop fastener of claim 1, wherein the loop backing comprises an elastic woven web.

9. The hook and loop fastener of claim 1, wherein the hook backing comprises a neck-bonded laminate.

10. The hook and loop fastener of claim 1, wherein the loop backing comprises a neck-bonded laminate.

11. The hook and loop fastener of claim 1, wherein the hook backing can be stretched between about 50% and about 200%.

12. The hook and loop fastener of claim 1, wherein the hook backing can be stretched between about 70% and about 170%.

13. The hook and loop fastener of claim 1, wherein the hook backing can be stretched between about 100% and about 150%.

14. An absorbent article comprising the hook and loop fastener of claim 1.

15. A diaper comprising the hook and loop fastener of claim 1.

16. A training pant comprising the hook and loop fastener of claim 1.

17. A feminine hygiene product comprising the hook and loop fastener of claim 1.

18. An incontinence product comprising the hook and loop fastener of claim 1.

19. A medical garment comprising the hook and loop fastener of claim 1.

20. The hook and loop fastener of claim 1, wherein at least one extensible material is creped.

21. The hook and loop fastener of claim 1, wherein the hooks include heads that overhang the hook backing in one or more discrete directions.

22. The hook and loop fastener of claim 1, wherein the hooks include heads that overhang the hook backing in multiple directions.

23. A hook component comprising:

an extensible, sheet-form substrate having first and second regions; and

a multiplicity of spaced-apart resin bases disposed on a front side of the substrate, the spaced-apart resin bases having integrally molded stems extending therefrom;

wherein bases in the first region are arranged to provide different overall extensibility than in the second region.

24. The hook component of claim 23, wherein the resin bases are non-contiguous with each other.

25. The hook component of claim 23, wherein the resin bases are arranged to form areas of the substrate having asymmetric extensibility.

26. The hook component of claim 23, wherein the bases extend in discrete, longitudinal rows.

27. The hook component of claim 23, wherein the bases extend in discrete, transverse rows.

28. The hook component of claim 23, wherein the bases form spaced-apart patches of hooks.

29. The hook component of claim 23, wherein the substrate material is biaxially extensible having an extensibility in a first direction and a second direction, perpendicular to the first direction.

30. The hook component of claim 29, wherein the bases are arranged to limit the level of extensibility of the extensible substrate more in one of the first and second directions than the other direction in the first region.

31. The hook component of claim 29, wherein the bases are arranged to limit the level of extensibility of the extensible substrate in both the first and second directions in the first region.

32. The hook component of claim 23, wherein the base portions are substantially non-extensible.

33. The hook component of claim 23 further including at least two regions having different extensibilities.

34. The hook component of claim 23, wherein the extensible substrate comprises an elastic nonwoven web.

35. The hook component of claim 23, wherein the extensible substrate comprises an elastic woven web.

36. The hook component of claim 23, wherein the extensible substrate comprises a neck-bonded laminate.

37. The hook component of claim 23, wherein the extensible substrate can be stretched between about 50% and about 200%.

38. The hook component of claim 23, wherein the extensible substrate can be stretched between about 70% and about 170%.

39. The hook component of claim 23 further including head portions extending radially from a distal end of the stems.

40. The hook component of claim 39, wherein the head portions overhang the base in one or more discrete directions.

41. The hook component of claim 39, wherein the head portions overhang the base in multiple directions.

42. A hook and loop fastener comprising:

a hook component including

an extensible, sheet-form substrate having first and second regions; and

a multiplicity of spaced-apart resin bases disposed on a front side of the substrate, the spaced-apart resin bases having fastener elements including stems extending outwardly from and integrally molded with the resin bases;

wherein bases in the first region are arranged to provide different overall extensibility than in the second region; and

a loop component including

an extensible loop backing and a plurality of loops protruding therefrom, the loops of the loop component sized to engage the fastener elements of the hook component.

43. The hook and loop fastener of claim 42, wherein the extensible loop backing includes spaced-apart material disposed on a broad surface of the loop backing.

44. The hook and loop fastener of claim 43, wherein the spaced-apart material disposed on the broad surface of the loop backing is arranged to provide different overall extensibility in a first region than in a second region.

45. The hook and loop fastener of claim 44, wherein fastener elements disposed in the first region of the hook component are engaged with loops in the first region of the loop component.

46. The hook and loop fastener of claim 42, wherein the fastener elements include head portions that overhang the base in one or more discrete directions.

47. The hook and loop fastener of claim 42, wherein the fastener elements include head portions that the base in multiple directions.

48. The hook and loop fastener of claim 42, wherein at least one of the extensible sheet-form substrate and the extensible loop backing are biaxially extensible having an extensibility in a first direction and a second direction, perpendicular to the first direction.

49. The hook and loop fastener of claim 42, wherein the sheet-form substrate comprises an elastic nonwoven web.

50. The hook and loop fastener of claim 42, wherein the loop backing comprises an elastic nonwoven web.

51. The hook and loop fastener of claim 42, wherein the sheet-form substrate comprises a neck-bonded laminate.

52. The hook and loop fastener of claim 42, wherein the loop backing comprises a neck-bonded laminate.

53. The hook and loop fastener of claim 42, wherein the sheet-form substrate can be stretched between about 50% and about 200%.

54. The hook and loop fastener of claim 42, wherein the sheet-form substrate can be stretched between about 70% and about 170%.

55. The hook and loop fastener of claim 42, wherein the sheet-form substrate can be stretched between about 100% and about 150%.

56. A method of forming a hook and loop fastener product comprising:

providing a sheet-form extensible first substrate having first and second regions;

attaching a multiplicity of spaced-apart resin bases on a front side of the substrate in the first region, the spaced-apart resin bases having fastener elements including stems extending outwardly from and integrally molded with the resin bases, to provide different overall extensibility in the first region than in the second region; and

engaging the fastener elements with matable elements extending from a discrete second substrate.

57. The method of claim 56, wherein the matable elements are loops.

58. The method of claim 56, wherein the second substrate is extensible.

59. The method of claim 58, wherein the second substrate is biaxially extensible having an extensibility in a first direction and a second direction, perpendicular to the first direction.

60. The method of claim 59 further including attaching a multiplicity of discrete, spaced-apart material on a broad surface of the second substrate in a first region to provide a different overall extensibility in the first region relative to a second region of the second substrate.

61. The method of claim 56, wherein the fastener elements include head portions that overhang the base in one or more discrete directions.

62. The method of claim 56, wherein the fastener elements include head portions that overhang the base in multiple directions.

63. The method of claim 56, wherein the resin bases are non-contiguous with each other.

64. The method of claim 56, wherein the resin bases are arranged to form areas of the substrate having asymmetric extensibility.

65. The method of claim 56, wherein the matable elements are nonwoven fibers.

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