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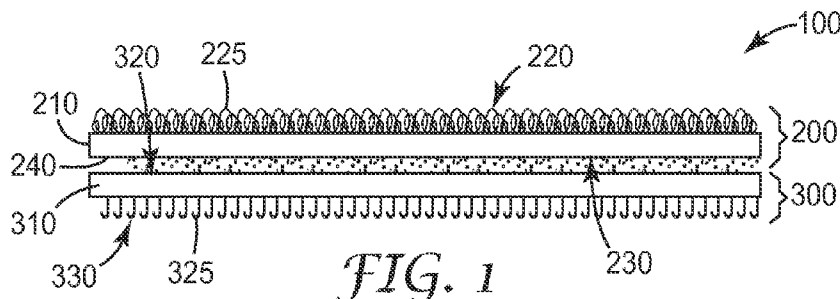
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(54) **Title:** A SECUREMENT ASSEMBLY



(57) **Abstract:** A securement assembly is disclosed that uses a combination of adhesive as well as mechanical fasteners for effectively securing a device to a surface. The securement assembly can be used to protect the surface from the device being secured. The securement assembly comprises an adhering element with a first mechanical fastener and a securing element with a second mechanical fastener, wherein the securing element can serve as both a cover for the adhesive on the adhering element while also providing the securement between the first mechanical fastener and second mechanical fastener.

WO 2014/014504 A1

A Securement Assembly

Field

5 The present disclosure relates to a securement assembly comprising an adhering element and a securing element and a method of using the adhering element and securing element to secure a device.

Background

10 Adhesive tapes and medical dressings are used in a variety of application for securing material to a substrate. In some applications, the adhesive of the tape may secure well to the substrate, but not be well suited for securing with the device. For example, silicone adhesives do not strongly secure to polymeric devices. In some applications, placement of the device directly in contact with the substrate, over which the adhesive tape is applied, can cause damage to the underlying substrate. For example, rigid devices placed adjacent to skin for an extended period of time can cause skin irritation or even pressure ulcers.

Summary

15 The securement assembly uses a combination of adhesive as well as mechanical fasteners for effectively securing a device to a surface. The securement assembly can be used to protect the surface from the device being secured. The securement assembly comprises an adhering element with a first mechanical fastener and a securing element with a second mechanical fastener, wherein in some 20 embodiments the securing element can serve as both a cover for the adhesive on the adhering element while also providing the securement between the first mechanical fastener and second mechanical fastener.

25 In one embodiment, the securement assembly comprises an adhering element and a securing element. The adhering element comprises a first surface comprising a first mechanical fastener, a second surface, opposite the first surface, comprising an adhesive. The securing element comprises a first surface, a second surface, opposite the first surface, a second mechanical fastener on at least the first surface or second surface of the securing element, wherein the second mechanical fastener is configured to secure with the first mechanical fastener. The first surface of the securing element covers and releasably secures to the adhesive of the second surface of the adhering element.

30 In one embodiment the securement assembly comprises an adhering element and a securing element. The adhering element comprises a first surface comprising a first mechanical fastener, a second surface, opposite the first surface, comprising an adhesive. The securing element, removable from the adhering element, comprises a first surface, a second surface, opposite the first surface, a second mechanical fastener on at least one of the first surface or second surface of the securing element. The 35 second mechanical fastener secures to the first mechanical fastener.

In one embodiment, the securement assembly comprises an adhering element and a securing element. The adhering element comprises a first surface comprising a first plurality of stems or hooks, a second surface, opposite the first surface, comprising an adhesive. The securing element comprises a first

surface, a second surface, opposite the first surface, comprising a second plurality of stems or hooks. A working adhesive is partially embedded into at least one of the first or second plurality of stems or hooks. The first plurality of stems or hooks secures to the second plurality of stems or hooks. A device is positioned between a portion of the first surface of the adhering element and the securing element.

5 In one embodiment, a method of securing a tape comprises providing a securement assembly, wherein the securement assembly comprises an adhering element comprising a first surface comprising a first mechanical fastener and a second surface, opposite the first surface, comprising an adhesive, a securing element comprising a first surface and a second surface, opposite the first surface, and a second mechanical fastener on at least one of the first surface or second surface of the securing element to secure
10 with the first mechanical fastener, wherein the securing element covers the adhesive of the second surface of the adhering tape, and removing the securing element from the adhering element, and securing the adhesive of the second surface of the adhering element to a surface.

 In one embodiment, a method of securing a device comprises providing an adhering element comprising a first surface comprising a first plurality of stems or hooks and a second surface, opposite the
15 first surface, comprising an adhesive, securing the adhesive to a surface, providing a securing element comprising a first surface and a second surface, opposite the first surface, comprising a second plurality of stems or hooks, placing a device on the adhering element, covering at least a portion of the device with the securing element, securing the first plurality of stems or hooks with the second plurality of stems or hooks, where a working adhesive is partially embedded into at least one of the first or second plurality of
20 stems or hooks.

Brief Description of the Drawings

FIG. 1 is a side sectional view of a first embodiment of a securement assembly;

FIG. 2 is a side sectional view of a second embodiment of a securement assembly;

25 FIG. 3 is a side sectional view of the adhering element of FIG. 1;

FIG. 4 is a top view of the adhering element of FIG. 3;

FIG. 5 is a side sectional view of the securing element of FIG. 1 or 2;

FIG. 6 is a bottom view of the securing element of FIG. 5;

FIG. 7 is a side sectional view of the adhering element shown securing a device to a surface;

30 FIG. 8 is a side sectional view of the adhering element and securing element shown securing a device to a surface;

FIG. 9 is a side sectional view of a third embodiment of a securement assembly;

FIG. 10 is a side sectional view of the adhering element and securing element of the securement assembly of FIG. 9 shown securing a device to a surface;

35 FIG. 11 is a side sectional view of a fourth embodiment of a securement assembly;

FIG. 12 is a top view of the adhering element of FIG. 11;

FIG. 13 is a top view of a fifth embodiment of a securement assembly including an opening 350;

FIG. 14 is a side view of a sixth embodiment of a securement assembly.

While the above-identified drawings and figures set forth embodiments of the invention, other embodiments are also contemplated, as noted in the discussion. In all cases, this disclosure presents the invention by way of representation and not limitation. It should be understood that numerous other modifications and embodiments can be devised by those skilled in the art, which fall within the scope and spirit of this invention. The figures may not be drawn to scale.

Detailed Description

FIG. 1 is a side sectional view of a first embodiment of a securement assembly 100, which comprises an adhering element 200 and a securing element 300. The securing element 300 includes second mechanical fastener 325, discussed in detail below, which in this embodiment faces outward from the securing assembly 100. FIG. 2 is a side sectional view of a second embodiment of a securement assembly 100, which comprises an adhering element 200 and a securing element 300. This embodiment is similar to FIG. 1; however, in this embodiment, the securement element 300 includes second mechanical fastener 325 that faces the adhesive 235 of the adhering element 200. The similar elements of these two embodiments will be discussed in detail below.

FIG. 3 is a side sectional view of the adhering element 200 of FIG. 1. In this embodiment, the adhering element 200 includes a backing 210. FIG. 4 is a top view of the adhering element 200 of FIG. 3. The adhering element 200 comprises a first surface 220 that includes a first mechanical fastener 225 (described in more detail below) and a second surface 230, opposite the first surface 220, which includes adhesive 235. As shown in the embodiment of FIG. 3, an optional backing 210 is included, which may be one more layers of material to which the adhesive 235 is attached. As shown in FIG. 2, there is not an additional backing secured to the first mechanical fastener 225, and the first mechanical fastener 225 itself forms the first surface 220 and second surface 230 of the adhering element 200 to which the adhesive 235 is applied directly.

The adhesive 235 may be any type of adhesive useful for securing the adhering element 200 to a surface 500. The type of adhesive selected will depend on the desired properties of peel force, shear force, permanence, removability, characteristics of adherent, etc. Typically, the adhesive 235 will be a pressure sensitive adhesive, which can adhere to a surface with application of light pressure and without the need for heat or other external sources to active adhesion. For example, the adhesive may be an acrylate, silicone, urethane, polyolefin, synthetic rubber, or natural rubber based adhesive.

When the surface to which the adhering element is applied is skin, it may be desirable that the adhesive 235 hold well to the skin, but does not irritate or damage the skin during use or upon removal. Commonly used adhesives for application to skin are acrylate and silicone adhesives. Acrylate adhesives are well suited for securing to skin. The adhesion can be manipulated to have high adhesion or low adhesion. Suitable acrylate adhesives that can be applied to skin such as the acrylate copolymers are described in U.S. Patent No. RE 24,906, the disclosure of which is hereby incorporated by reference. In particular, a 97:3 iso-octyl acrylate:acrylamide copolymer. Another acrylate adhesive is an 70:15:15 isooctyl acrylate: ethyleneoxide acrylate:acrylic acid terpolymer, as described in U.S. Pat. No. 4,737,410

(Example 31), the disclosure of which is hereby incorporated by reference. Other useful acrylate adhesives are described in U.S. Pat. Nos. 3,389,827; 4,112,213; 4,310,509; and 4,323,557, the disclosures of which are hereby incorporated by reference.

5 Generally, silicone adhesives are able to effectively secure dressings and tapes to skin and upon removal from the skin produce little or no skin damage. Typically, the silicone adhesives do not adhere well to polymer-based substrates, like tubing or hardgoods. The gentle removal of silicone adhesives from skin makes silicone adhesives well suited as the adhesive intended to contact the skin.

10 An example of a suitable silicone adhesive is disclosed in PCT Publications WO2010/056541 and WO2010/056543, the disclosures of which are herein incorporated by reference. A radiation cured silicone adhesive is particularly well suited for this application because the extent of crosslinking, and therefore adhesion of the silicone adhesive can be better controlled. Other examples of silicone gel adhesives systems include products marketed with the trade names: Dow Corning MG 7-9850, Wacker SILPURAN® 2110 and 2130, Bluestar SILBIONE® RT Gel 4317 and 4320, Nusil MED-6345 and 6350.

15 Optionally, backing 210 on the adhering element 200, if included, could be treated physically (e.g., corona, plasma, or flame treatment) or chemically (e.g., primer, adhesion promoter) before the adhesive 235 is applied in order to enhance the adhesion of adhesive 235 on backing 210.

20 The adhesive 235 may cover all or a portion of the second surface 230 of the adhering element 200. Also, the adhesive 235 may be applied to the second surface 230 in a discontinuous pattern or may be perforated. When the adhering element 200 is applied to skin, it is particularly desirable to have perforations or a pattern coating of adhesive to allow for moisture vapor to move away from the skin and out of the adhering element 200. For example, U.S. Pat. No. 4,595,001 and U.S. Pat. App. Pub. 2008-0233348, the disclosures of which are herein incorporated by reference, disclose a method of pattern coating adhesive.

25 The adhering element 200, and backing 210 if included, may be constructed from any number of common materials such as, for example, paper, film, foam, fabric, or nonwoven, to which the adhesive 235 is applied. The adhering element 200, and backing 210 if included, may comprise one or more layers of materials secured to one another. In some embodiments, the material selected for the adhering element 200 may itself serve as the first mechanical fastener 225, such as shown in FIG. 2. As shown in FIGS. 1 and 3, the adhering element 200 include a thin paper or film backing 210, with a loop filament on the surface of the backing 210. As shown in FIG. 2, the adhering element 200 includes a nonwoven material forming first mechanical fastener 225.

30 Overall, the thickness, stiffness, flexibility, permeability of the adhering element 200 will depend on the particular application and surface 500 to which the adhering element 200 is secured. For example, if the surface 500 is skin it may be desirable that the adhering element 200 is highly flexible and conformable to anatomical surface. Also, it may be desirable that the adhering element 200 allow for high moisture vapor permeability, but generally impermeable to liquid water so that microbes and other contaminants are sealed out from the area under the adhering element 200. One example of a suitable material is nonwoven or woven fabric. Another example of a suitable material is a high moisture vapor

permeable film such as described in US Patents 3,645,835 and 4,595,001, the disclosures of which are herein incorporated by reference. In high moisture vapor permeable film/adhesive composites, the composite should transmit moisture vapor at a rate equal to or greater than human skin such as, for example, at a rate of at least 300 g/m² /24 hrs at 37°C/100-10% RH, or at least 700 g/m² /24 hrs at 37°C/100-10% RH, or at least 2000 g/m² /24 hrs at 37°C/100-10% RH using the inverted cup method as described in U.S. Pat. No. 4,595,001. In one embodiment, the backing 210 is an elastomeric polyurethane, polyester, or polyether block amide films. These films combine the desirable properties of resiliency, high moisture vapor permeability, and transparency.

FIG. 5 is a side sectional view of the securing element 300, shown in either FIG. 1 or FIG. 2. FIG. 6 is a bottom view of the securing element 300 shown in FIG. 5. The securing element 300 comprises a first surface 320 and a second surface 330, opposite the first surface 320. When assembled with the adhering element 200, such as shown in FIGS. 1 or 2, the first surface 320 of the securing element 300 covers the adhesive 235 of the adhering element 200. In the embodiment shown in FIG. 1, the second surface 330 includes the second mechanical fastener 325. In the embodiment shown in FIG. 2, the first surface 320 includes the second mechanical fastener 325. As shown in FIG. 5, an optional backing 310 may be included as one more layers of material to form either the first surface 320 or second surface 330. The backing 310 is optional because the second mechanical fastener 325 may be formed to include both the fastener and a backing-like portion, all of the same material.

First mechanical fastener 225 and second mechanical fastener 325 are selected so that a secure mechanical, interlocking interaction is formed when placed in contact with one another. In one embodiment, the first mechanical fastener 225 and second mechanical fastener 325 are reclosable, so that an interlocking interaction is formed that can be opened and reclosed. In one embodiment, the first mechanical fastener 225 and second mechanical fastener 325 are able to interlock with one another to secure, but with sufficient force are able to disengage. In one embodiment, depending on the selection of both materials for achieving mechanical fastening, the first or second mechanical fasteners may comprise various constructions of hooks, loops, or stems, each of which may include selectively placed adhesive.

In one embodiment, as shown in FIGS. 1-3, the first mechanical fastener 225 comprises loop material and the second mechanical fastener 325 comprises a plurality of hooks. Loop material can be any suitable material that interlocks with a corresponding hook. In some embodiment, the loop material includes one or more filaments or fibers that may be arranged as knitted, woven, or non-woven fabrics. The term “non-woven” refers to a material having a structure of individual fibers or threads that are interlaid but not in an identifiable manner such as in a knitted fabric. Examples of non-woven webs include spunbond webs, spunlaced webs, airlaid webs, meltblown web, and bonded carded webs. In some embodiment, the loop material itself comprises the adhering element 200, with no additional backing 210. In some embodiments, the loop material comprises a fibrous layer disposed on the backing 210. Exemplary suitable loop materials are described, for example, in U.S. Pat. Nos. 5,616,394; 5,256,231; and 5,389,416. As described in U.S. Pat. No. 5,256,231, the fibrous layer in a loop material according to

some embodiments disclosed herein comprises arcuate portions projecting in the same direction from spaced anchor portions on the backing.

A hook as used herein is a fastening element that interlocks with a corresponding hook or interlocks with a loop material. Typically, a plurality of hooks are provided. In some embodiment, a hook is a generally outward projecting post with a laterally extending portion, which can interlock with a corresponding hook or loop material. Exemplary hook designs are disclosed in U.S. Pat. Nos. 5,845,375; 5,077,870; 5,607,635; and 5,679,302 the disclosures of which are herein incorporated by reference.

The hooks can be integral (that is, formed at the same time as a unit, unitary) with a backing. Upstanding posts on a backing can be made, for example, by feeding a thermoplastic material onto a continuously moving mold surface with cavities having the inverse shape of the posts. The thermoplastic material can be passed between a nip formed by two rolls or a nip between a die face and roll surface, with at least one of the rolls having the cavities. Pressure provided by the nip forces the resin into the cavities. In some embodiments, a vacuum can be used to evacuate the cavities for easier filling of the cavities. The nip typically has a large enough gap such that a coherent backing is formed over the cavities. The mold surface and cavities can optionally be air or water cooled before stripping the integrally formed backing and upstanding hook elements from the mold surface such as by a stripper roll. If the posts formed upon exiting the cavities do not have loop-engaging heads, loop-engaging heads could be subsequently formed into hooks by a capping method as described in U.S. Pat. No. 5,077,870 (Melbye et al.). Typically, the capping method includes deforming the tip portions of the hook elements using heat and/or pressure. The heat and pressure, if both are used, could be applied sequentially or simultaneously.

A stem as used herein is a fastening element that could be used as the first and/or second mechanical fastener. A stem is a protrusion that projects from a surface. While hooks generally have an overhang, or other portion that projects laterally from the main body of the hook to create the interlocking fastening system, a stem typically does not have a portion that projects laterally from the main body of the stem. In one embodiment, a stem will have linear side walls or slightly tapered side walls. A plurality of stems provide for a high amount of surface area to resist shear forces between the stems and the surface it is contacting. Fig. 14 below shows and describes examples of how stems can be incorporated as one of the first and/or second mechanical fasteners.

In one embodiment, the securing element 300 covers the adhesive 235 of the adhering element 200 to serve as a protective liner over the adhesive 235 of the adhering element 200. The securing element 300 is removable from the adhesive 235 of the adhering element 200. Specifically, the first surface 320 of the securing element 300 can be removed from the adhesive 235. In one embodiment, once the securing element 300 is removed, the adhering element 200 (FIG. 3) and securing element 300 (FIG. 5) separate from one another. It is understood that, the adhering element 200 and securing element 300 do not necessarily need to be entirely disconnected from one another and in some embodiments may be partially connected to one another. In one embodiment, the adhesive properties can be manipulated to aid in the removal of the securing element 300 from the adhering element 200. In one embodiment, the first surface 320 of the securing element 300 may include a coating, such as a low adhesion backsize (LAB) or

a silicone release coating to aid in the removal of the securing element 300 from the adhering element 200. In another embodiment, such as shown in FIG. 2, the second mechanical fastener 325 itself may aid in removal of the securing element 300 from the adhering element 200. For example, when the second mechanical fastener 325 is a plurality of hooks, the hooks provided less surface area contact with the adhesive 235 and therefore limit the force required to remove the securing element 300 from the adhering element 200. Optionally, the second mechanical fastener 325 can be surface coated with an adhesion modifier coating.

In one embodiment, a portion of the securing element 300 extends beyond the adhesive 235 of the adhering element 200 to form a tab 340 to aid in removing the securing element 300 from the adhering element 200. In one embodiment, the adhesive 235 may not extend completely to the edge of the second surface 230 of the adhering element 200 such that a tab 240 is formed to aid in removing the securing element 300 from the adhering element 200. In one embodiment, such as would be applicable for FIG. 2, a portion of the second mechanical fastener 325, if hooks or stems, can be crushed such as described in U.S. Patent 5,933,927, the disclosure of which is herein incorporated by reference. When crushing a portion of the second mechanical fasteners 325, the recessed portion from the crushed hooks or stems does not sufficiently contact the adhesive 235 and therefore forms a tab 240.

The securing element 300 can be formed of one or more layers of material, such as, for example, paper, film, foam, fabric, or nonwoven. Typically, the securing element 300 will be relatively flexible to allow for a drapable arrangement over a device 600 while still coming into contact with the first mechanical fastener 225 on the adhering element 200 (see FIGS. 8, 10, 11).

The exposed adhesive 235 of the adhering element 200 can be applied to a surface 500. In one embodiment, the adhering element 200 can be used alone for securement to a surface 500. For example, FIG. 7 shows a side sectional view of the adhering element 200 of the securement assembly 100 of FIG. 1 or FIG. 2 shown securing a device 600 to a surface 500. As can be seen, the device 600 is placed in contact with the surface 500 while the adhering element 200 overlies the device 600 and secures the device to the surface 500. Extending outward from the adhering element 200 is the first mechanical fastener 225.

In one embodiment, the adhering element 200 can be used with the securing element 300 for securement with an optional underlying device 600 to a surface 500. For example, FIG. 8 (similarly FIGS. 10, 11, and 14) shows a side sectional view of the adhering element 200 and securing element 300 of the securement assembly 100 of FIG. 1 or FIG. 2 shown securing a device 600 to a surface 500. As can be seen, the adhering element 200 is fully applied in contact with the surface 500. A device 600 is positioned over a portion of the first surface 220. The second mechanical fastener 325 of the securing element 300 is applied over the first surface 220 of the adhering element 200, containing the first mechanical fastener 225. The first mechanical fastener 225 and second mechanical fastener 325 securely connect to one another to secure the device 600. In this embodiment, the device 600 is supported by the adhering element 200 and is not in direct contact with the surface 500. Therefore, the adhering element 200 serves to protect the underlying surface 500 from contact with the device 600.

The securement assembly 100 shown in FIGS. 9 and 10 is similar to the previously disclosed securement assembly 100 described in FIGS. 1-8. However, in the embodiments in FIGS. 9 and 10, the first mechanical fastener 225 comprises a plurality of hooks and the second mechanical fastener 325 comprises a plurality of hooks. Various designs of interlocking hook/hook designs can be incorporated herein, such as those disclosed in U.S. Pat. 5,607,636.

In addition, FIG. 9 shows that a portion of the adhering element 200 can be integrally connected with a portion of the securing element 300, such that the two do not entirely separate from one another. However, the securing element 300 can move from a position of covering the adhesive 235 of the adhering element 200, as shown in FIG. 9, to a position wherein the first mechanical fastener 225 and second mechanical fastener 325 contact one another.

In addition, FIG. 10 shows an optional friction control element 400. A friction control element 400 is used to further secure the device 600 to the securement assembly 100. The arrangement such as shown in FIG. 8 would provide for securement of the underlying device 600 from a force pulling up on the device. However, there may be little resistance to a laterally applied force. A friction control element 400 can be included to provide securement to a laterally applied force. It is understood that in some embodiments, the construction of the adhering element and/or the securing element itself may provide some resistance to a laterally applied force.

As shown in FIG. 10, the friction control element 400 is directly on the device 600. In this embodiment, the friction control element 400 is a plurality of hooks on the device 600 that secure with both the first mechanical fastener 225 and second mechanical fastener 325. These hooks on the device 600 could be provided as a material applied to the device or created directly on the device.

It is understood that any suitable material can be provided that when in contact with the device 600 can provide additional securement. For example, stems (see US Patents 6,372,323; 6,610,382; and 6,904,615), hook material, loop material, or adhesive could be used to further secure the device 600. The friction control element 400 can be located on the device 600, such as shown in FIG. 10. In other embodiments the friction control element 400 can be located on one or both of the adhering element 200 or securing element 300. It is understood that the friction control element 400 may be provided on only a portion of one or both of the adhering element 200, securing element 300, or device 600. For example, FIG. 11 and FIG. 12 show another embodiment of a securement assembly 100 with a construction similar to that shown and described in FIGS. 1-8. However, in this embodiment, the securing element 300 includes a friction control element 400 on a portion of the first surface 220 of the adhering element 200. As can be seen in FIG. 12, the friction control element 400 is in a center portion of the adhering element 200 with the first mechanical fastener 225 on either side. In this embodiment, the friction control element 400 is adhesive.

Optionally, the first mechanical fastener 225, second mechanical fastener 325 or both may include a working adhesive 226, 326, respectively, such as shown in FIGS. 10 and 14. This working adhesive 226, 326 can further aid in securing directly with the device 600 such as shown in FIG. 10. Also, the working adhesive 226, 326 can further provide securement of the first mechanical fastener 225 to the

second mechanical fastener 325, shown more specifically in FIG. 14. In one embodiment, the working adhesive 226 is recessed from the outermost portion of the first mechanical fastener 225. In one embodiment, the working adhesive 326 is recessed from the outermost portion of the second mechanical fastener 325. In one embodiment, the working adhesive 226 and 326 is recessed from both the first and second mechanical fasteners 325, as shown in FIG. 14. The extent to which the mechanical fasteners are arranged and the extent of the recess of the recessed adhesive can impact whether or not that surface will feel tacky to a user's touch. In one embodiment, either the first surface 220 having the first mechanical fastener 225 and recessed working adhesive, or the surface having the second mechanical fastener 325 and recessed working adhesive are not sticky to the user's touch. When the first mechanical fastener 225 and second mechanical fastener 325 are stems, such as shown in FIG. 14, or hooks, the protruding portions of the stem or hook can extend into the space containing the adhesive 226, 326, even if only one of the surfaces includes adhesive, and high levels of securement are achieved.

Specifically, FIG. 14 shows a securement assembly 100 with an adhering element 200 and a securing element 300. On the first surface 220 of the adhering element 200 is the first mechanical fastener 225, which comprises a plurality of stems. Also on the first surface 220 is the first working adhesive 226 that is recessed from the outermost portion of the stems. The securing element 300 would initially cover the adhesive 235 of the adhering element 200 similar to that shown in either FIGS. 1 or 2. However, FIG. 14 shows the securing element 330 and the second mechanical fastener 325 applied over the first mechanical fastener 225 of the adhering element 200. In this embodiment, the second mechanical fastener 325 also comprises a plurality of stems and also includes a second working adhesive 326 that is recessed from the outermost portion of the stems. During use the stems interact with one another to provide mechanical securement, specifically from applied shear forces, while the first and second working adhesive 226, 326 interact to resist peel forces. Examples of stems that would be useful as first or second mechanical fastener are described in US Pat. No. 4,959,265; 6,372,323; 6,610,382; and 6,904,615, the disclosures of which are herein incorporated by reference. It is understood that only one of the first mechanical fastener 225 or second mechanical fastener 325 could include a working adhesive, while still achieving high resistance to shear forces and peel forces, because the stems of the overlying sheet will embed into the working adhesive.

In one embodiment, the stems are included in a density of at least 500 stems per square inch. In one embodiment, the stems are included in a density of at least 1000 stems per square inch. In one embodiment the stems have a height at least 50 microns. In one embodiment the stems have a height of at least 100 microns. In one embodiment, the stems have a height less than 500 microns.

When a working adhesive is included in an embodiment where the mechanical fastener is either stems or hooks, the working adhesive may be provided the full height of the stems or hooks or may be recessed from the stems or hooks. Such recessed working adhesives on a plurality of stems or hooks may be coated in a variety of ways, including solvent coating or bulk coating.

A variety of factors, such a stem/hook density, stem/hook flexibility may impact the apparent tackiness of the recessed adhesive. High tackiness may help enable securement of the secured tubing or

medical device, but low tackiness prevents the material from sticking to gloved fingers. In one embodiment, a plurality of stems/hooks with a working adhesive will have not finger tack with the working adhesive provided less than 25% of the stem/hook height. In one embodiment, a plurality of stems/hooks with a working adhesive will have slight finger tack with the working adhesive provided between 25% and 45% of the stem/hook height. In one embodiment, a plurality of stems/hooks with a working adhesive will have good finger tack with the working adhesive provided at greater than 45% of the stem/hook height. It is understood that a protective release liner could be used to cover the surface that contains a working adhesive.

Optionally, securing element 300 could have an opening 350, wherein at least a portion of the device 600 could pass through. FIG. 13 shows an example of a securing element 300 with a device 600 passing through from the first surface 320 to the second surface 330. It is understood that the opening 350 may include a throughhole that the device 600 passes through, a slit that wraps around the device 600, or as shown in FIG. 13, two parts of securing element 300 that wrap around the device 600. It is understood that although not specifically shown in the view, an underlying adhering element 200 is included for the securement assembly 100 to secure with the surface 500 and to which the shown securing element 300 is attached.

The surface and device can be any number of types and materials. For example, the surface may be rigid or compliant, plastic, glass, wood, fabric, or skin. The device can be any kind of device that is desired to be secured to a surface. For example, the device may be rigid or compliant, plastic, glass, wood, fabric and be for electrical, medical, or various types of application. In one specific application, the surface is skin and the device is a medical device, such as a tube, catheter, port, or pump.

The securement assembly 100 can be provided in any number of forms. For example, the securement assembly 100 may be an elongated in a roll and torn or cut to the desired length for use. However, for the construction shown and described in FIG. 1 and 9, roll form may be less desirable as the outward projecting hook will interlock with the underlying/overlying hook or loop of the roll. Alternatively, precut strips, sections, in various sizes and shapes, which include medical dressings, may be used to provide the securement assembly 100. Medical dressings are used for a number of applications, such as, but not limited to catheter securement or wound coverings. Depending on the application, the securement assembly 100 may be provided in a sterile package.

Although the first and second mechanical fastener 225, 325 are shown over most of the surface of the adhering element 200 and securing element 300, respectively, it is understood that either adhering element 200 or securing element 300 may include the mechanical fasteners over only a small portion of the surface area. For example, a medical dressing, such as a dressing used to cover an intravenous catheter may use the securement assembly 100 construction such that the adhering element 200 is applied to skin and the overlying securing element 300 covers and secures the outwardly projecting medical tubes. In this example, only portions of either the adhering element 200 or securing element 300 might include the mechanical fasteners.

5 Various embodiments have been described. It is understood that the medical dressing can be provided in a number of sizes, shapes, configurations, in a package, sterilized, with or without liners covering any of the exposed or tacky adhesive surfaces. It is understood that various features, material, components described in one of the embodiment could be used and incorporated into one or more of the other disclosed embodiments. For example any one of the described adhering element could be used with any one of the described securing elements. Additionally, it is understood that additional features such as working adhesive, tabs, or backings described with one embodiment may be applicable to other embodiments.

10 Although specific embodiments of this invention have been shown and described herein, it is understood that these embodiments are merely illustrative of the many possible specific arrangements that can be devised in application of the principles of the invention. Numerous and varied other arrangements can be devised in accordance with these principles by those of ordinary skill in the art without departing from the spirit and scope of the invention. Thus, the scope of the present invention should not be limited to the structures described in this application, but only by the structures described by the language of the claims and the equivalents of those structures.

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What is claimed is:

1. A securement assembly comprising:

an adhering element comprising:

a first surface comprising a first mechanical fastener;

a second surface, opposite the first surface, comprising an adhesive;

a securing element comprising:

a first surface;

a second surface, opposite the first surface;

a second mechanical fastener on at least the first surface or second surface of the securing element, wherein the second mechanical fastener is configured to secure with the first mechanical fastener;

wherein the first surface of the securing element covers and releasably secures to the adhesive of the second surface of the adhering element.

2. The securement assembly of claim 1, wherein the adhering element comprises one or more layers of a woven, knitted, paper, film, or nonwoven material and the securing element comprises one or more layers of a woven, knitted, paper, film, or nonwoven material.

3. The securement assembly of any one of the preceding claims, wherein the first mechanical fastener comprises a plurality of hooks, loops, or stems.

4. The securement assembly of any one of the preceding claims, wherein a portion of the securing element extends beyond the second surface of the adhering element forming a tab.

5. The securement assembly of any one of the preceding claims, wherein the second mechanical fastener is on the first surface of the securing element.

6. The securement assembly of any one of the preceding claims, wherein the second mechanical fastener is on the second surface of the securing element.

7. The securement assembly of any one of the preceding claims, wherein the second mechanical fastener is on the second surface of the securing element and the first surface of the securing element includes a release coating.

8. The securement assembly of any one of the preceding claims, further comprising a friction control element placed on at least one of the adhering element or securing element for securement to a device.

9. The securement assembly of any one of the preceding claims, wherein the friction control element is a third mechanical fastener on the device configured to secure with at least one of the first mechanical fastener or second mechanical fastener.

5 10. The securement assembly of any of one the preceding claims, further comprising a working adhesive embedded in at least one of the first mechanical fastener or second mechanical fastener.

11. A securement assembly comprising

an adhering element comprising:

10 a first surface comprising a first mechanical fastener;

a second surface, opposite the first surface, comprising an adhesive;

a securing element, at least partially removable from the adhesive of the adhering element, comprising:

a first surface;

15 a second surface, opposite the first surface;

a second mechanical fastener on at least one of the first surface or second surface of the securing element;

wherein, the second mechanical fastener secures to the first mechanical fastener;

20 wherein a device is positioned between a portion of the first surface of the adhering element containing the first mechanical fastener and the overlying second mechanical fastener.

12. The securement assembly of any one of claim 11, wherein the first mechanical fastener comprises a plurality of hooks, loops, or stems.

25 13. The securement assembly of any one of claims 11-12, wherein the second mechanical fastener comprises a plurality of hooks, loops, or stems.

14. The securement assembly of any one of claim 11-13, wherein the second mechanical fastener is removable from the first mechanical fastener.

30 15. The securement assembly of any one of claims 11-14, wherein the second mechanical fastener is on the first surface of the securing element.

35 16. The securement assembly of any one of claim 11-15, wherein the second mechanical fastener is on the second surface of the securing element.

17. The securement assembly of any one of claims 11-16, further comprising a friction control element placed on at least one of the adhering element or securing element for further securing the device.

18. The securement assembly of any one of claims 11-17, further comprising a friction control element on the device for interacting with one of the adhering element or securing element for further securing a device.

5

19. The securement assembly of any one of claims 11-18, wherein the friction control element is a third mechanical fastener configured to secure with at least one of the first mechanical fastener or second mechanical fastener.

10

20. The securement assembly of any one of claims 11-19, further comprising a working adhesive at least partially embedded in at least one of the first mechanical fastener or second mechanical fastener.

21. A securement assembly comprising

an adhering element comprising:

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a first surface comprising a first plurality of stems or hooks;

a second surface, opposite the first surface, comprising an adhesive;

a securing element comprising:

a first surface;

20

a second surface, opposite the first surface, comprising a second plurality of stems or hooks;

wherein a working adhesive is partially embedded into at least one of the first or second plurality of stems or hooks;

wherein the first plurality of stems or hooks secures to the second plurality of stems or hooks;

25

wherein a device is positioned between a portion of the first surface of the adhering element and the second surface of the securing element.

22. A method of securing a securement assembly comprising:

providing a securement assembly comprising:

30

an adhering element comprising a first surface comprising a first mechanical fastener and

a second surface, opposite the first surface, comprising an adhesive;

a securing element comprising a first surface and a second surface, opposite the first surface, and a second mechanical fastener on at least one of the first surface or second surface of the securing element to secure with the first mechanical fastener, wherein the securing element covers the adhesive of the second surface of the adhering element;

35

removing the securing element from the adhering element;

securing the adhesive of the second surface of the adhering element to a surface.

23. The method of claim 22, wherein removing the securing element from the adhering element comprises removing the first surface of the securing element from the second surface of the adhering element.

24. The method of any one of claims 22-23, further comprising:

5 placing a portion of a device adjacent the first mechanical fastener.

25. The method of any one of claims 22-24, further comprising:

 securing at least a portion of the second mechanical fastener to the first mechanical fastener;
wherein the device is secured between a portion of the first mechanical fastener and second mechanical
10 fastener and wherein a portion of the first mechanical fastener and second mechanical fastener secure
together.

26. The method of any one of claims 22-25, wherein the device comprises a third mechanical fastener that
is able to secure with at least one of the first mechanical fastener or second mechanical fastener.

27. The method of any one of claims 22-26, wherein the first mechanical fastener comprises a plurality of
15 hooks, loops, or stems.

28. The method of any one of claims 22-27, wherein a portion of the securing element extends beyond the
20 second surface of the adhering element forming a tab for removing the securing element from the
adhering element.

29. The method of any one of claims 22-28, wherein the second mechanical fastener comprises a plurality
of hooks, loops, or stems.

30. A method of securing a device comprising:

 providing an adhering element comprising a first surface comprising a first plurality of stems or
hooks and a second surface, opposite the first surface, comprising an adhesive;

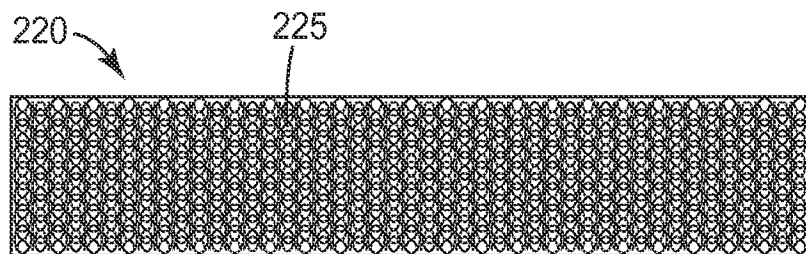
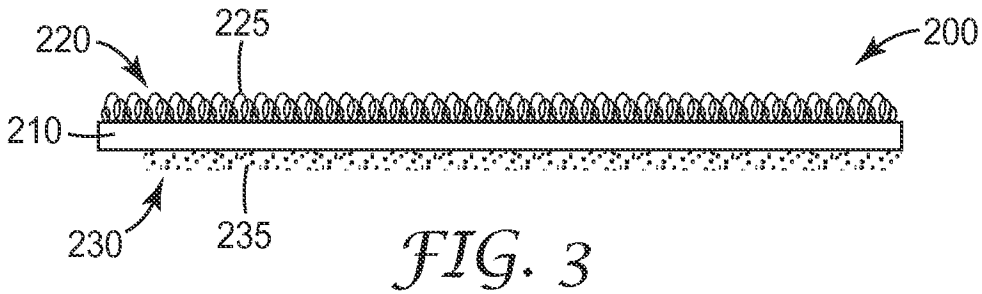
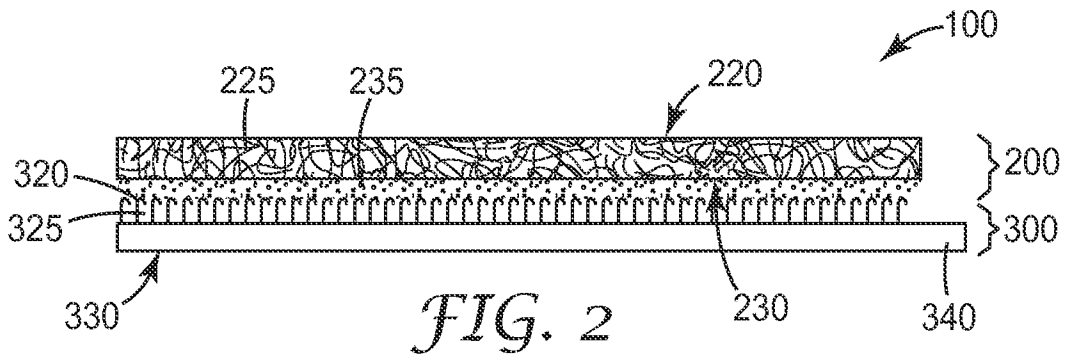
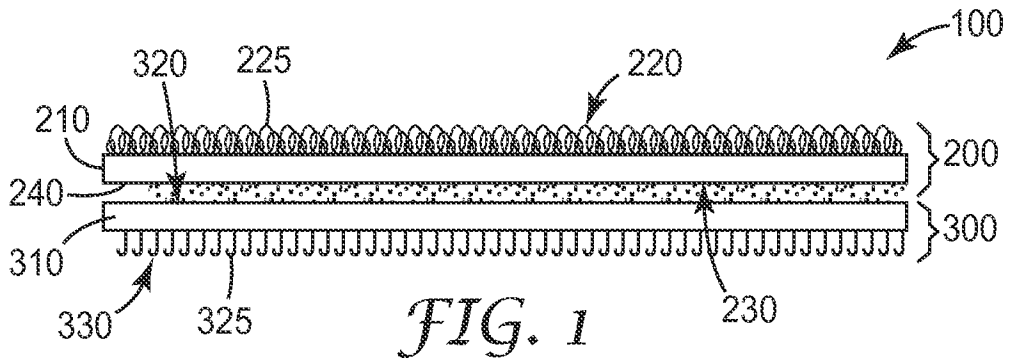
 securing the adhesive to a surface;

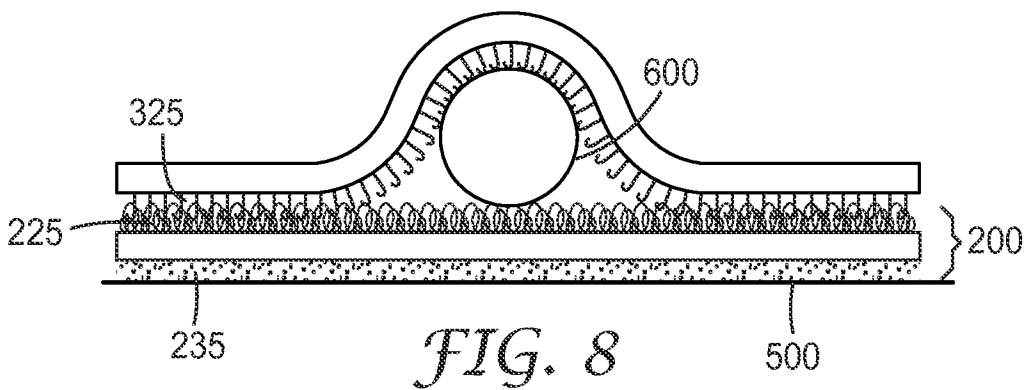
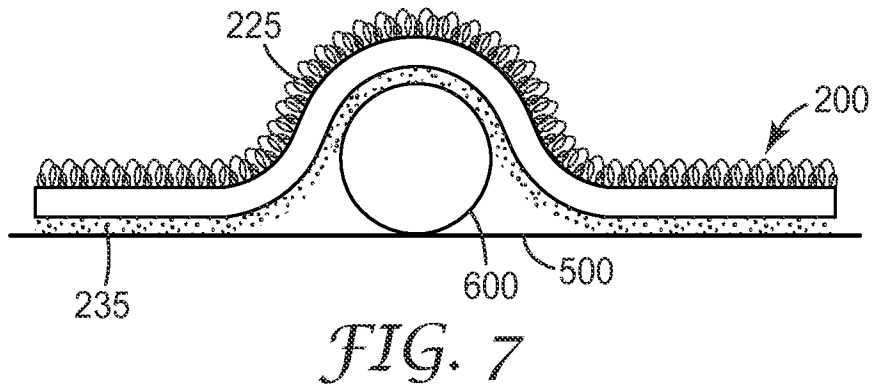
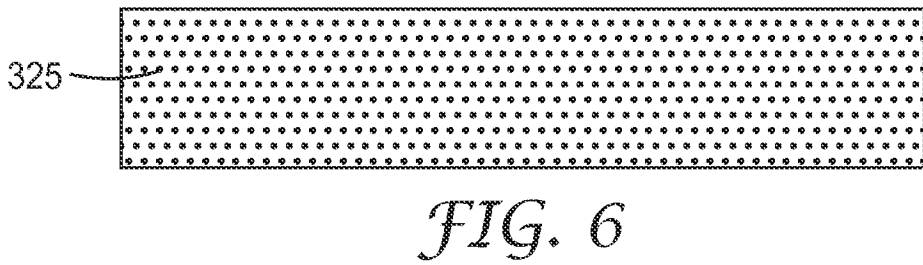
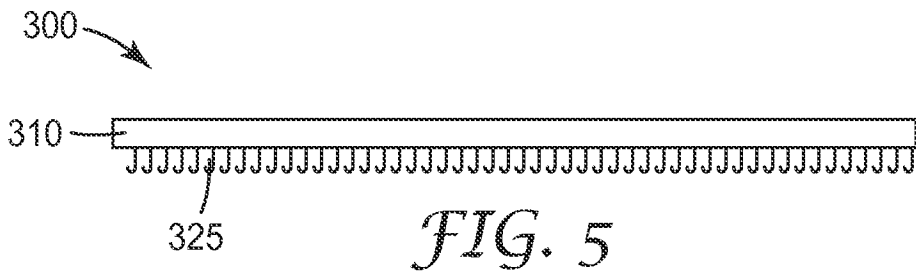
30 providing a securing element comprising a first surface and a second surface, opposite the first
surface, comprising a second plurality of stems or hooks;

 placing a device on the adhering element;

 covering at least a portion of the device with the securing element;

35 securing the first plurality of stems or hooks with the second plurality of stems or hooks, where a
working adhesive is partially embedded into at least one of the first or second plurality of stems or hooks.





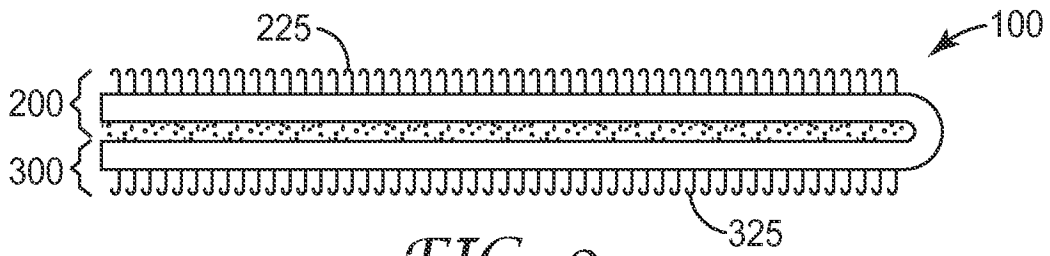


FIG. 9

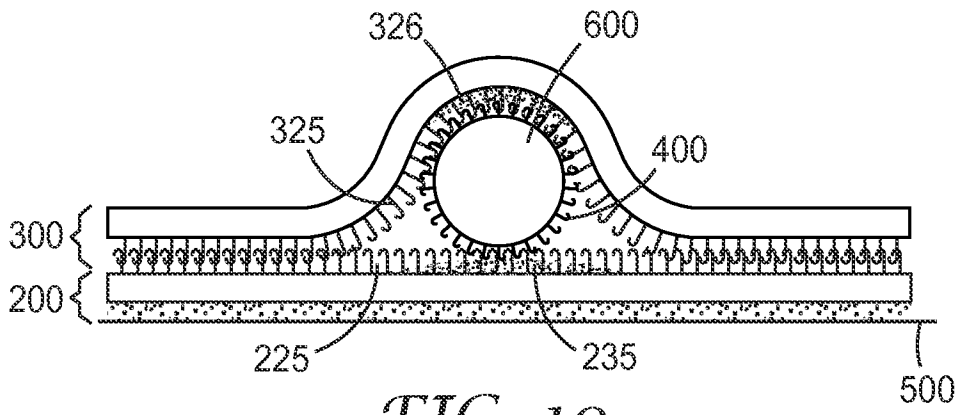


FIG. 10

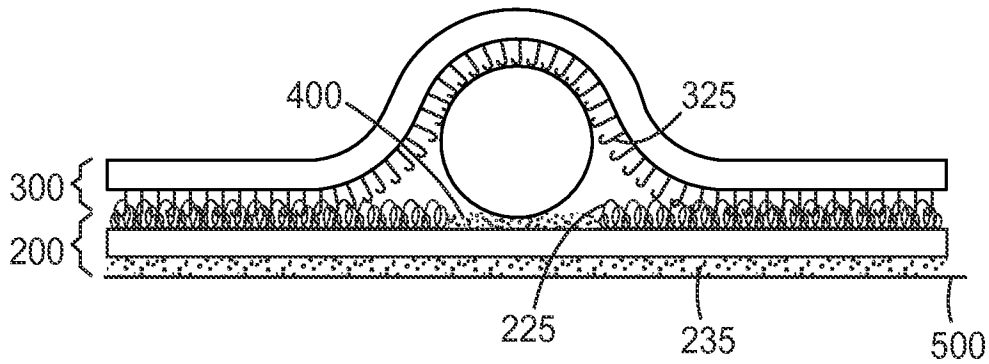


FIG. 11

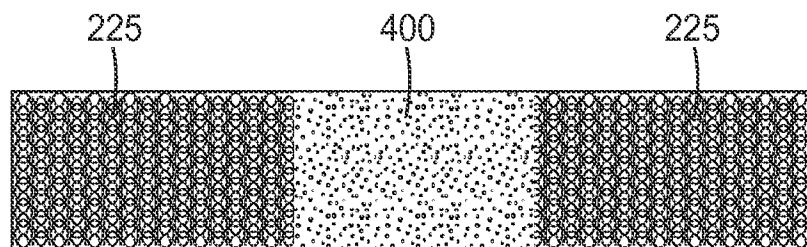


FIG. 12

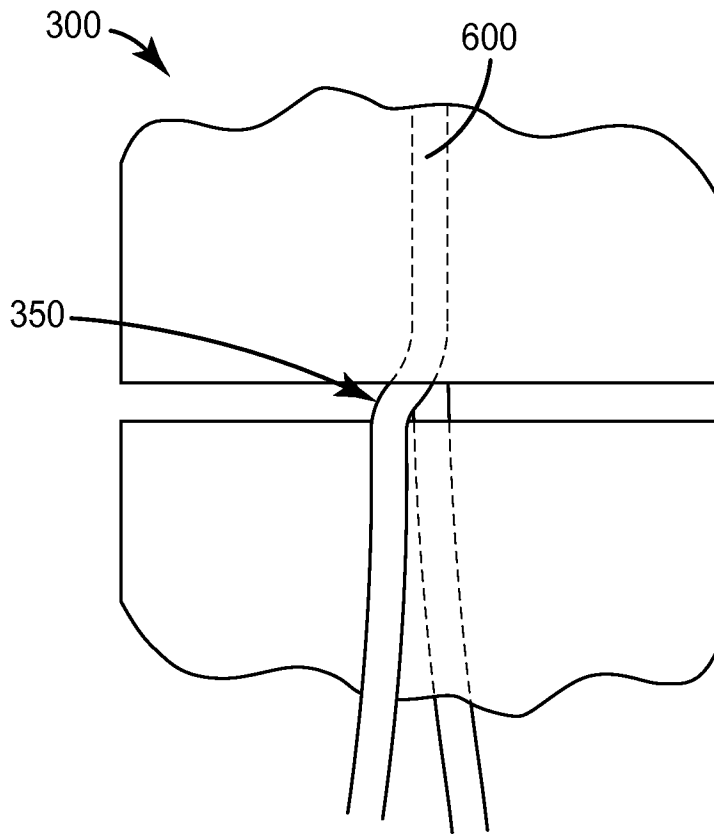


FIG. 13

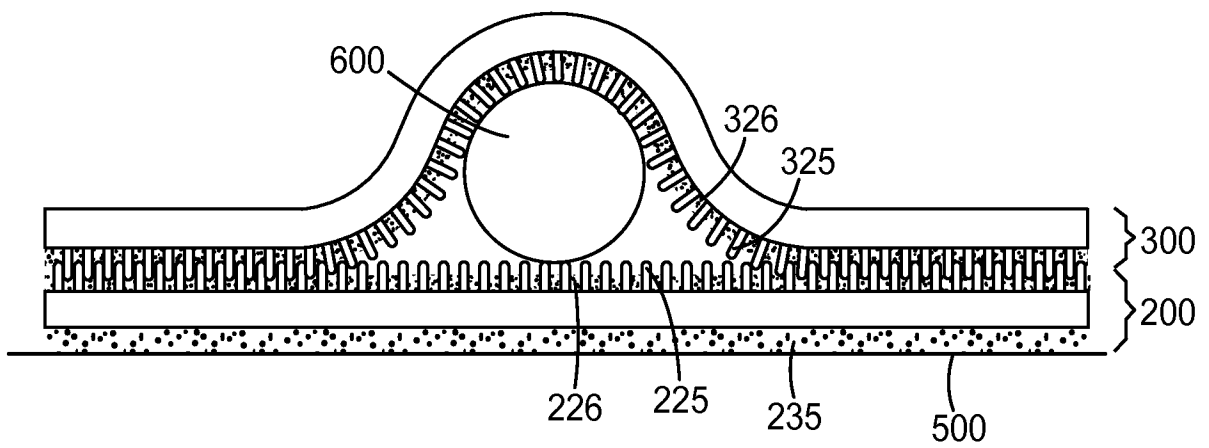


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/030431

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A61F13/00 A61F13/02 A61F13/58 A61F15/00
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 A61F

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/058122 A1 (VELCRO IND [NL]; KINGSFORD HOWARD A [US]; ISABELLE HOLLY [US]; PROVOST) 15 July 2004 (2004-07-15)	1-6, 11-16,21
Y	page 19, line 15 - page 19, line 24 page 24, line 6 - page 24, line 10 figures 7b,7c,7d,8,8a,12e,16d,	7-10, 17-20
X	US 6 545 193 B1 (MORGENSTERN MICHAEL [US]) 8 April 2003 (2003-04-08)	1-6
Y	figures 6,14,15,16 column 5, line 4 - column 5, line 20	7-21
X	US 2010/307668 A1 (LANGE STEPHEN JOSEPH [US] ET AL) 9 December 2010 (2010-12-09)	1-6
Y	paragraphs [0002], [0029], [0050], [0053], [0054]; figure 2B	7-21
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 5 June 2013	Date of mailing of the international search report 12/06/2013
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Gennari, Silvia
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/030431

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 321 234 A1 (PROCTER & GAMBLE [US]) 21 June 1989 (1989-06-21)	1-6
Y	column 9, line 30 - column 10, line 31 claim 1 figure 2	7-21
X	----- US 6 195 850 B1 (MELBYE WILLIAM L [US] ET AL) 6 March 2001 (2001-03-06)	1-6
Y	figure 1 column 5, line 11 - column 5, line 30 -----	7-21

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/030431

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 22-30
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(v) PCT - Presentation of information
2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/030431

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/030431

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