

Description

FIELD OF THE INVENTION

This invention relates to disposable absorbent articles, and more particularly, to an improved tape fastener system for such disposable absorbent articles that provides improved disposability.

BACKGROUND OF THE INVENTION

The use of adhesive tape fastener systems for securing the corners of a disposable absorbent article such as a diaper is well known in the art. Examples of these types of adhesive tape fastener systems are described in U.S. Patent Re. 28,151 entitled "Disposable Diaper" which issued to Robert C. Duncan et al. on January 31, 1967; and U.S. Patent 3,848,594 entitled "Tape Fastening Systems for Disposable Diaper" issued to Kenneth B. Buell on November 19, 1974.

Adhesive tape fastener systems provide a secure means for keeping a disposable absorbent article on the wearer during use. In addition, re-fastenable adhesive tape fastener systems allow the disposable absorbent article to be folded or rolled up into a tight package for disposal, secured in the disposal configuration, and easily disposed in waste receptacles. When such adhesive tape fasteners are secured to the rolled-up absorbent article, the contents of the absorbent article are generally prevented from spilling or leaking out while the absorbent article is being thrown away.

Adhesive tape fastener systems have, however, a number of shortcomings, one of which is that they are easily contaminated by oils and powders that come in contact with the adhesive positioned on the tape tabs such that the adhesive does not readily adhere to the absorbent article with sufficient strength to provide an effective side closure. In addition, an adhesive tape fastener system may cause the backsheet of the absorbent article to rip or tear when the fastener system is unfastened, thereby leaving the fastener system unrefastenable and unusable for disposal purposes.

A number of concepts have been proposed for providing washable diapers with mechanical fastening systems disposed on the body portion of the absorbent article. In addition, concepts of providing a disposable absorbent article with a tape fastener system having a mechanical fastening element have been proposed. See, for example, U.S. Patent No. 4,846,815, Scripps, issued July 11, 1989. While mechanical fastening systems, such as hook and loop-type mechanical fasteners, generally provide fastening systems that are not easily contaminated by oils and powders and that are more convenient for refastening than adhesive tape fas-

teners, mechanical fastening systems do not provide a disposal mechanism by which the soiled absorbent article may be rolled-up to contain the contents of the absorbent article and secured in the disposal configuration so that the absorbent article may be conveniently thrown away.

In mechanical fastening systems, the hook fastening material is positioned in a first end region of the absorbent article and the loop fastening material is disposed in a second end region of the absorbent article. Thus, when the absorbent article is folded or rolled up for disposal, the loop fastening material is typically tucked underneath other portions of the absorbent article so that the loop fastening material is not exposed, thereby preventing the hook fastening material from engaging the loop fastening material. In addition, because the hook fastening material is incapable of being fastened to the exposed areas of the absorbent article, especially the backsheet, the absorbent article cannot be conveniently secured in a configuration for disposal. Thus, it would be advantageous to provide a mechanical fastening system capable of providing convenient disposal of the absorbent article.

Fastening elements comprising intermeshing projections are disclosed in US-A-4,322,875. No facilities of disposal are provided by the known fastening elements. From EP-A- 0 374 730, a disposable diaper having all features appearing in the pre-characterising part of Claim 1 is known. Upon contamination of the adhesive fastening surface as disclosed in the above document, application of the adhesive tapes for disposal purposes is hampered.

It is, therefore, an object of the present invention to provide a disposable absorbent article having an improved fastening system.

It is a further object of the present invention to provide a disposable absorbent article having a mechanical fastener system in combination with an improved adhesive tape disposal means to provide convenient disposal of the absorbent article.

These and other objects of the present invention will be more readily apparent when considered in reference to the following description and when taken in connection with the accompanying drawings.

SUMMARY OF THE INVENTION

The present invention encompasses an improved tape fastener system for disposable absorbent articles such as diapers. In general, an improved tape fastener system is provided having a mechanical fastening means, initial adhesive securement means, and a reserve/protected adhesive securement means. The mechanical fastening means provide for effective side closure of the

absorbent article, whereas the initial adhesive and reserve adhesive securement means provide a disposal mechanism by which the absorbent article may be folded or rolled up into a configuration for disposal that prevents the contents of the soiled absorbent article from leaking, and secured in the disposal configuration.

While the improved tape fastener system may take many configurations, it preferably comprises a primary tape tab comprising a first fastening element joined to and disposed on a first area of the primary tape tab and an adhesive securement means associated with and disposed on at least a second area of the primary tape tab; and a landing member comprising a second fastening element mechanically engageable with the first fastening element of the primary tape tab. In addition, the tape fastener system comprises a secondary tape tab joined to the primary tape tab. The secondary tape tab also has an adhesive securement means associated therewith.

The first fastening element and the primary tape tab adhesive securement means may be disposed on the primary tape tab in a number of configurations. Preferably, the first fastening element and the primary tape tab adhesive securement means are each entirely disposed on the user's end of the primary tape tab with the first fastening element being disposed adjacent the distal edge of the primary tape tab. More preferably, a portion of the primary tape tab adhesive securement means is disposed subjacent the first fastening element to join the first fastening element to the primary tape tab.

Similarly, the secondary tape tab may be joined to the primary tape tab in a number of configurations. In a preferred configuration, the secondary tape tab overlays the primary tape tab adhesive securement means, protecting it from contamination. In use, the first fastening element on the primary tape tab engages the second fastening element on the landing member to provide a secure side closure for the absorbent article. After the absorbent article has been soiled, it can be folded or rolled up into a configuration for disposal that generally prevents the contents of the soiled absorbent article from spilling or leaking out of the absorbent article. The absorbent article is then secured in its disposal configuration by the adhesive securement means on the secondary tape tab. If the adhesive securement means on the secondary tape tab is contaminated (e.g., by baby powder and/or oil) and loses its adhesive properties, the secondary tape tab may be peeled away from the primary tape tab to expose the primary tape tab adhesive securement means which can then be used to secure the absorbent article in its disposal configuration.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a partially cut-away perspective view of a diaper embodiment incorporating the present invention.

Figure 2 is a cross-sectional view of the corner of the diaper taken along line 2-2 of Figure 1.

Figure 3 is a cross-sectional view of the corner of the diaper taken along line 2-2 of Figure 1, showing the free end of the secondary tape tab peeled away from the primary tape tab.

Figure 4 is a plan view of the corner of the diaper shown in Figure 2.

Figure 5 is a cross-sectional view similar to Figure 2 of an alternative embodiment of the present invention.

Figure 6 is a cross-sectional view similar to Figure 2 of a further alternative embodiment of the present invention.

Figure 7 is a perspective view showing the diaper of Figure 1 in the configuration it would assume when placed on a wearer.

Figure 8 is a perspective view showing the diaper of Figure 1 in a configuration for disposal prior to use of the adhesive securement means of the present invention.

Figure 9 is a perspective view showing the diaper of Figure 1 in its disposal configuration with the adhesive securement means of the present invention providing securement of the diaper in the disposal configuration.

DETAILED DESCRIPTION OF THE INVENTION

Tape fastener systems of the present invention are useful and beneficial when applied to disposable absorbent articles. As used herein, the term "disposable absorbent article" refers to articles which absorb and contain body exudates and, more specifically, refers to articles which are placed against or in proximity to the body of the wearer to absorb and contain the various exudates discharged from the body and which are intended to be discarded after a single use (i.e., they are not intended to be laundered or otherwise restored or reused). A preferred embodiment of the disposable absorbent article of the present invention is a diaper 20. As used herein, the term "diaper" refers to a garment generally worn by infants or incontinent persons that is drawn up between the legs and fastened about the waist of the wearer. Examples of the kinds of diapers to which the present invention is very readily adapted are shown in the above-referenced U.S. Patent Re. 26,151 issued to Duncan et al. and in U.S. Patent 3,860,003 entitled "Contractable Side Portions for Disposable Diaper" which issued to Kenneth B. Buell on January 14, 1975. It will be apparent from the following descrip-

tion that the tape fastener system illustrated and described herein may be applied to the body portion of such diapers. On the other hand, it will be understood that the invention is not limited to any specific diaper structure or configuration.

Referring to the drawings, it will be noted that Figure 1 is a partially cut-away perspective view of the diaper 20 of the present invention prior to its being placed on the diaper wearer by the diaper user. As can be seen in Figure 1, a preferred diaper 20 comprises a body portion 22 and a tape fastener system 24. A preferred body portion 22 comprises a liquid pervious topsheet 26, an absorbent core 28, a liquid impervious backsheet 30, and elastically contractible leg cuffs 32 comprising a side flap 34 and one or more elastic members 36. While the topsheet 26, the absorbent core 28, the backsheet 30, the side flaps 34, and the elastic members 36 may be assembled in a variety of well known configurations, a preferred disposable diaper configuration is shown and described generally in the above-referenced U.S. Patent 3,860,003.

Figure 1 shows a preferred embodiment of the body portion 22 in which the topsheet 26 and the backsheet 30 are coextensive and have length and width dimensions generally larger than those of the absorbent core 28. The topsheet 26 is superposed on the backsheet 30 thereby forming the periphery 38 of the body portion 22. The periphery 38 defines the outer perimeter or, in other words, the outer extent of the body portion 22. The periphery 38 comprises longitudinal edges 40 and end edges 42.

The body portion 22 has an inside surface 44 and an outside surface 46. In general, the outside surface 46 of the diaper 20 extends from one end edge 42 to the other end edge 42 of the diaper and from one longitudinal edge 40 to the other longitudinal edge 40 of the diaper and is the surface farthest from the wearer during use of the diaper 20. When a backsheet 30 is used, it typically forms the outside surface 46 of the body portion 22. The inside surface 44 is that surface of the diaper opposite the outside surface 46 and in the embodiment shown is typically formed by the topsheet 26. In general, the inside surface 44 of the diaper 20 is that surface coextensive with the outside surface 46 and which is for the greater part in contact with the wearer when the diaper 20 is worn.

The diaper 20 has first and second end regions 48 and 50, respectively, extending from the end edges 42 of the diaper periphery 38 toward the lateral centerline of the diaper 20. Both the first end region 48 and the second end region 50 extend a distance of about one-half of the length of the diaper 20 such that the end regions comprise each half of the diaper 20.

Each of the first end regions 48 and the second end regions 50 have panels 51. The panels 51 are those portions of the first end region 48 and the second end region 50 which overlap when the diaper 20 is fastened about the waist of the wearer. The extent to which the end regions overlap and thus the extent to which the panels 51 are formed will depend on the overall dimensions and shape of the diaper 20 and the size of the wearer.

The absorbent core 28 of the body portion 22 may be any means which is generally compressible, conformable, non-irritating to the wearer's skin, and capable of absorbing and retaining liquids and certain body exudates. The absorbent core 28 may be manufactured in a wide variety of sizes and shapes (e.g., rectangular, hourglass, asymmetric, etc.) and from a wide variety of liquid absorbent materials commonly used in diapers and other disposable absorbent articles, such as comminuted wood pulp which is generally referred to as the airfelt. Examples of other suitable absorbent materials include creped cellulose wadding, absorbent foams, absorbent sponges, superabsorbent polymers, absorbent gelling materials, or any equivalent materials or combination of materials. The total absorbent capacity of the absorbent core 28 should, however, be compatible with the design exudate loading in the intended use of the diaper 20. Further, the size and absorbent capacity of the absorbent core 28 may be varied to accommodate wearers ranging from infants to adults.

While the absorbent core 28 may comprise a single layer of absorbent material such as the configuration described in U.S. Patent 4,610,678 entitled "High-Density Absorbent Structure" which issued to Paul T. Weisman and Steven A. Goldman on September 9, 1986 a preferred embodiment of the absorbent core 28 is a dual-layered absorbent core in a preferred configuration such as is generally described in U.S. Patent 4,673,402 entitled "Absorbent Article With Dual-Layered Cores" which issued to Paul T. Weisman, Dawn I. Houghton and Dale A. Gellert on June 16, 1987 having an asymmetric-shaped upper layer 52 and a lower layer 54. The upper layer 52 preferably acts as a liquid acquisition/distribution layer comprised primarily of hydrophilic fiber material. The lower layer 54 acts as a fluid storage layer comprised of a mixture of hydrophilic fiber material and particles of an absorbent gelling material (hydrogel material). Each of the upper layer 52 and the lower layer 54 preferably comprises an absorbent layer encased in a tissue layer. It should be understood, however, that the size, shape, configuration, and total absorbent capacity of the upper layer 52 or the lower layer 54 may be varied to accommodate wearer's ranging from infants through adults. Therefore, the dimensions, shape, and configuration of both the

upper layer 52 and the lower layer 54 may be varied (e.g., the upper layer or the lower layer may have a varying caliper, a hydrophilic gradient, a rapid acquisition zone or may contain absorbent gelling material).

The absorbent core 28 is superposed on the backsheet 30 and is preferably attached thereto by a core attachment means 55 such as those well known in the art, for example, pressure-sensitive adhesives, hot melt adhesives or other adhesives; ultrasonic bonding; or heat/pressure sealing. The absorbent core 28 may be secured to the backsheet 30 by a uniform continuous layer of adhesive, a patterned layer of adhesive, or any array of separate lines or spots of adhesive. An adhesive which has been found to be satisfactory is a hot-melt adhesive such as manufactured by Eastman Chemical Products Company of Kingsport, Tennessee and marketed under the trade name of Eastobond A-3 or by Century Adhesives, Inc., of Columbus, Ohio and marketed under the trade name Century 5227. The core attachment means 55 preferably comprise an open pattern network of filaments of adhesive as is shown in U.S. Patent 4,573,986 entitled "Disposable Waste-Containment Garment" which issued to James A. Minetola and David R. Tucker on March 4, 1986.

The backsheet 30 is impervious to liquids and is preferably manufactured from a thin plastic film, although other flexible liquid impervious materials may also be used. The backsheet 30 prevents the exudates absorbed and contained in the absorbent core 28 from soiling articles which contact the diaper 20 such as bed sheets and undergarments. Preferably, the backsheet 30 is a polyethylene film having a thickness of from about 0.012 mm (0.5 mil) to about 0.051 mm (2.0 mils), although other flexible, liquid impervious materials may be used. As used herein, the term "flexible" refers to materials which are compliant and which will readily conform to the general shape and contours of the human body.

A suitable polyethylene film is manufactured by Monsanto Chemical Corporation and marketed in the trade as Film No. 8020. The backsheet 30 is preferably embossed and/or matte finished to provide a more clothlike appearance. Further, the backsheet 30 may permit vapors to escape from the absorbent core 28 while still preventing exudates from passing through the backsheet 30.

The size of the backsheet 30 is dictated by the size of the absorbent core 28 and the exact diaper design selected. In a preferred embodiment, the backsheet 30 has a modified hourglass shape extending beyond the absorbent core a minimum distance of at least about 1.3 cm to about 2.5 cm (about 0.5 to about 1.0 inch) around the entire diaper periphery 38.

The topsheet 26 of the body portion 22 of the present invention is compliant, soft feeling, and non-irritating to the wearer's skin. Further, the topsheet 26 is liquid pervious permitting liquids to readily penetrate through its thickness. A suitable topsheet 26 may be manufactured from a wide range of materials such as porous foams, reticulated foams, apertured films, natural fibers (e.g., wood or cotton fibers), synthetic fibers (e.g., polyester or polypropylene fibers) or from a combination of natural and synthetic fibers. Preferably, it is made of a hydrophobic material to isolate the wearer's skin from liquids retained in the absorbent core 28.

A particularly preferred topsheet 26 comprises staple length polypropylene fibers having a denier of about 1.5, such as Hercules Type 151 polypropylene fibers marketed by Hercules, Inc. of Wilmington, Delaware. As used herein, the term "staple length fibers" refer to those fibers having a length of at least about 15.9 mm (0.625 inches).

There are a number of manufacturing techniques which may be used to manufacture the topsheet 26. For example, the topsheet 26 may be woven, non-woven, spunbonded, carded, hydroformed or the like. A preferred topsheet 26 is carded and thermally bonded by means well known to those skilled in the fabric art. Preferably, the topsheet 26 has a basis weight from about 15 to about 30 grams per square meter, a minimum tensile strength of at least about 400 grams per centimeter in the machine direction and a tensile strength of at least about 55 grams per centimeter in the cross-machine direction.

The topsheet 26 and the backsheet 30 are associated together in any suitable manner as is well known in the diaper manufacturing art. As used herein, the term "associated" encompasses configurations whereby the topsheet 26 is directly joined to the backsheet 30 by affixing the topsheet 26 directly to the backsheet 30, and configurations whereby the topsheet 26 is indirectly joined to the backsheet 30 by affixing the topsheet 26 to intermediate members which in turn are affixed to the backsheet 30. In a preferred embodiment, the topsheet 26 and the backsheet 30 are joined directly to each other in the diaper periphery 38 by a flap attachment means 56 such as an adhesive or any other attachment means as is known in the art. In general, the core attachment means 55 that affixes the absorbent core 28 to the backsheet 30 is the same means as the flap attachment means 56 that affixes the topsheet 26 to the backsheet 30. Thus, for example, a uniform continuous layer of adhesive, a patterned layer of adhesive, an array of separate lines or spots of adhesive, or a network of adhesive filaments such as shown in the above-referenced U.S. Patent 4,573,986 may be used.

Elastically contractible leg cuffs 32 are disposed adjacent the periphery 38 of the body portion 22, preferably along each longitudinal edge 40 so that the leg cuffs 32 tend to draw and hold the diaper 20 against the legs of the wearer. While the leg cuffs 32 may comprise any of several means as are well known in the diaper art, a particularly preferred leg cuff construction comprises a side flap 34 and one or more elastic members 36, as is described in detail in the hereinbefore referenced U.S. Patent 3,860,003. In addition, a method and apparatus suitable for manufacturing a disposable diaper having elastically contractible leg cuffs are described in U.S. Patent 4,081,301 entitled "Method and Apparatus For Continuously Attaching Discrete, Stretched Elastic Strands to Predetermined Isolated Portions of Disposable Absorbent Articles" which issued to Kenneth B. Buell on March 28, 1978. In a preferred embodiment, the elastically contractible leg cuff 32 comprises a side flap 34 and an elastic member 36 comprising an elastic thread.

The diaper 20 is provided with a tape fastener system 24 for forming a side closure. When the diaper 20 is fitted to the wearer, the first end region 48 and the second end region 50 are maintained in an overlapping configuration, as shown in Figure 7. Figure 7 is a perspective view showing the diaper of Figure 1 in the configuration it would assume when placed on a wearer.

In a preferred embodiment of the present invention as shown in Figure 1, the tape fastener system 24 comprises a primary tape tab 60 disposed adjacent each longitudinal edge 40 of the body portion 22 in the first end region 48, each primary tape tab 60 comprising a first fastening element 62 joined to and disposed on a first area of the primary tape tab 60, a primary tape tab adhesive securement means 63 associated with and disposed on at least a second area of the primary tape tab 60; a secondary tape tab 61 joined to the primary tape tab 60, the secondary tape tab 61 having an adhesive securement means 65 associated therewith; and a landing member 64, preferably comprising a second fastening element 66 mechanically engageable with the first fastening element 62, disposed on the outside surface 46 of the body portion 22 in the second end region 50.

As shown in the drawings, the tape fastener system 24 preferably comprises a primary tape tab 60. Any of the well known configurations and constructions of a tape tab may be used. A preferred primary tape tab 60 is a Y-shaped tape tab as described in detail in U.S. Patent 3,848,594 entitled "Tape Fastening System for Disposable Diaper" which issued to Kenneth B. Buell on November 19, 1974. As shown in Figure 1, a primary tape tab 60 is provided adjacent each longitudinal edge 40 of

the body portion 22, most preferably in the first end region 48.

A particularly preferred primary tape tab 60 is illustrated in Figure 2 and has a fastening surface 70 and a backing surface 72. The primary tape tab fastening surface 70 is that surface of the primary tape tab 60 designed to engage the landing member 64 of the present invention. Thus, the fastening surface 70 of the primary tape tab 60 will generally correspond to the inside surface 44 of the body portion 22 and will have the primary tape tab adhesive securement means 63 and the first fastening element 62 disposed on it. The primary tape tab backing surface 72 is that surface opposite of the primary tape tab fastening surface 70 and generally corresponds to the outside surface 46 of the body portion 22. The primary tape tab backing surface 72 is thus generally exposed during wear of the diaper 20.

The preferred primary tape tab 60 illustrated in Figure 2 is one which is anchored to both the inside surface 44 and the outside surface 46 of the body portion 22 to create a manufacturer's end (i.e., that attachment of the tape tab 60 to the diaper 20 made during manufacture of the diaper 20). The primary tape tab 60 has another element which forms the user's end (i.e., that joint made by the person in securing the diaper to the wearer). Thus, the preferred tape tab 60 of the present invention has at least three elements, a first fixed portion 74 having a first surface 75 and a second surface 75', a second fixed portion 76 having a first surface 77 and a second surface 77', and a connective portion 78 having a first surface 79 and a second surface 79'. The first fixed portion 74 is that portion of the primary tape tab 60 which is attached to the inside surface 44 of the body portion 22. The second fixed portion 76 is that portion of the primary tape tab 60 which is attached to the outside surface 46 of the body portion 22. The first fixed portion 74 and the second fixed portion 76 thus form the manufacturer's end of the primary tape tab 60. The connective portion 78 is that portion of the primary tape tab 60 which is attached to another portion of the diaper 20, generally the landing member 64, by the user when securing the diaper 20 on the wearer. The connective portion 78 thus forms the user's end. Additionally, the second surface 77' of the second fixed portion 76 and the second surface 79' of the connective portion 78 form the backing surface 72 of the primary tape tab 60 while the first surface 75 of the first fixed portion 74 and the first surface 79 of the connective portion 78 form the fastening surface 70 of the primary tape tab 60.

The preferred Y-shaped primary tape tab 60 of the present invention can be constructed in several ways. The first fixed portion 74, the second fixed

portion 76, and the connective portion 78 can each be separate tapes which meet and are joined adjacent the longitudinal edge 40 of the body portion 22 in an area of joinder. A more practical structure for the primary tape tab 60 is one in which the connective portion 78 and either the first fixed portion 74 or the second fixed portion 76 is a unitary strip of tape material. If the connective portion 78 is unitary with the second fixed portion 76 as shown in Figure 2, then the first fixed portion 74 is a separate element which is attached to the combined connective portion 78 and the second fixed portion 76 adjacent to the longitudinal edge 40 of the body portion 22 at an area of joinder 80.

Figure 2 also shows tab attachment means for securing the primary tape tab 60 to the body portion 22. These tab attachment means are any of those attachment means which provide an adequate bond, and preferably are any of the pressure-sensitive adhesives well-known to those of ordinary skill in the adhesive art. The second surface 75' of the first fixed portion 74 is affixed to the inside surface 44 of the body portion 22 by a first tab attachment means 82. The first surface 77 of the second fixed portion 76 is affixed to the outside surface 46 of the body portion 22 by a second tab attachment means 82'. The connective portion 78 has an adhesive securement means 63 associated with it on the first surface 79. Since the connective portion 78 and the second fixed portion 76 are preferably unitary as shown in Figure 2, the adhesive securement means 63 and the second tab attachment means 82 are generally the same element coated onto the unitary structure in a continuous manner.

Preferred materials for the primary tape tabs 60 comprises a tape material such as tape code numbers XPF 14.43.0, Y-9376, or Y-9030 available from The Minnesota Mining and Manufacturing Company, St. Paul, Minnesota. The tape material in the embodiments of the present invention are preferably a polyethylene film having a tab attachment means tailored to bond to the polyethylene positioned on the tape material. The tab attachment means may comprise any of those adhesives which provide an adequate bond with other portions of the diaper and is preferably any of the pressure-sensitive adhesives well known to those of ordinary skill in the art. Preferred tab attachment means is a pressure-sensitive adhesive such as code number XPF 1.42.34 available from The Minnesota Mining and Manufacturing Company, St. Paul Minnesota.

As shown in Figure 2, the primary tape tab 60 may also have a grip tab 83 at the distal edge 81 of the connective portion 78. The grip tab may be formed by folding over a small margin of the distal edge 81 of the connective portion 78 and attaching

it to itself. This forms an end on the connective portion 78 which is easier to grasp by the diaper user when the diaper 20 is to be fitted and attached to the wearer. The grip tab 83 is most beneficial when used when the connective portion 78 is superposed on the first fixed portion 74.

The first fastening element 62 of the primary tape tab 60 forms a closure between the primary tape tab 60 and the landing member 64. In particular, the first fastening element 62 provides an element or elements that mechanically engage the second fastening element 66 of the landing member 64 to provide a secure side closure. The first fastening element 62 may thus comprise any of the well known means for achieving a side closure such as hook fastening materials or loop fastening materials.

The first fastening element 62 may be a separate member joined to the primary tape tab 60 or a unitary member with the primary tape tab 60. For example, the primary tape tab 60 may be manufactured to have engaging elements formed or molded thereon so as to mechanically engage the landing member 64 (the primary tape tab 60 having a unitary first fastening element 62), or a discrete patch or strip of material may be joined to the primary tape tab 60 (a separate first fastening element 62). Preferably, the first fastening element 62 is a separate patch of material joined to a portion of the fastening surface 70 of the primary tape tab 60.

The first fastening element 62 is preferably joined to a portion of the fastening surface 70 of the primary tape tab 60. As used herein, the term "joined" encompasses configurations whereby the first fastening element 62 is releasably secured to the primary tape tab 60 so that the first fastening element 62 may be peeled away from the primary tape tab adhesive securement means 63 by the user especially after the diaper 20 has been soiled and whereby the first fastening element 62 is affixed to the primary tape tab 60 such that the first fastening element 62 is securely fastened to the primary tape tab 60. Joined is also used to denote that the first fastening element 62 may be directly joined to the primary tape tab 60 or may be indirectly joined to the primary tape tab 60 such as by releasably securing or affixing the first fastening element 62 to an intermediate member which in turn is releasably secured or affixed to the primary tape tab 60. Preferably, as shown in Figure 2, the first fastening element 62 is directly affixed to the connective portion 78 of the primary tape tab 60 by the primary tape tab adhesive securement means 63, although any other adhesive attachment means as is known in the art may be used to join the first fastening element 62 to the primary tape tab 60; for example, the adhesive attachment means may be

placed on the first fastening element 62 separately and the combined material joined to the connective portion 78.

While the first fastening element 62 may be disposed anywhere on the fastening surface 70 of the primary tape tab 60, the first fastening element 62 is preferably disposed entirely on the connective portion 78 (user's end) of the primary tape tab 60. Additionally, while the first fastening element 62 may be disposed anywhere on the connective portion 78 such as adjacent the area of joinder 80 or in the middle section of the connective portion 78, the first fastening element 62 is preferably disposed adjacent the distal edge 81 so that the first fastening element 62 provides maximum fit adjustment of the diaper 20 on the wearer.

As shown in the drawings, the first fastening element 62 is disposed on a first area of the fastening surface 70 of the primary tape tab 60. Thus, the surface area of the first fastening element 62 generally defines the first area. The first area can have any desired shape, for example, rectangular, square, circular, oval, triangular, or trapezoidal. In preferred embodiments of the present invention as shown in Figure 4, the first area will be rectangular-shaped.

It has been found that the first area should comprise between about 5% and about 95% of the total surface area of the fastening surface 70 of the primary tape tab 60. More preferably, the first fastening element 72 is disposed entirely on the connective portion 78 (user's end) of the primary tape tab 60. Thus, the first area preferably comprises between about 10% and about 90%, more preferably between about 20% and about 70%, of the total surface area of the connective portion 78. In an exemplary embodiment, the first area comprises about 33% of the total surface area of the connective portion 78 such that the first area is about 25 mm (about 1.0 inch) by about 12.5 mm (about 0.5 inch) (about 312.5 mm²).

Figure 2 shows a preferred first fastening element 62 of the present invention. The first fastening element 62 of the present invention preferably comprises a hook fastening material 84. As used herein, the term "hook fastening material" is used to designate a material having engaging elements 86. Thus, the hook fastening material 62 may also be referred to as a male fastener. It should also be understood that the use of the term "hook" should be non-limiting in the sense that the engaging elements 86 may comprise any shapes as are known in the art so long as they are adapted to engage a complementary second fastening element 66. As shown, the hook fastening material 84 preferably comprises a base 88 having a first surface and a second surface and a plurality of engaging elements 86 extending from the first surface of

the base 88. Each of the engaging elements 86 are shown to comprise a stem 94 supported at one end on the first surface of the base 88 and an enlarged head 96 positioned at the end of the stem 94 opposite of the base 88.

The preferred hook fastening material 84 of the present invention is intended to engage fibrous elements of a loop fastening material so as to provide a secure fastening device. Thus, the hook fastening material 84 may be manufactured from a wide range of materials. Suitable materials include nylon, polyester, polypropylene, or any combination of these materials. A suitable hook fastening material 84 comprises a number of shaped engaging elements 86 projecting from a woven backing such as the commercially available material designated "Scotchmate" brand No. FJ3402 available from Minnesota Mining and Manufacturing Company, St. Paul, Minnesota. Alternatively, the engaging elements may have any shape such as hooks, "T's" or any other shape as are well known in the art. A particularly preferred hook fastening material is described in U.S. Patent No. 4,820,307, Scripps, issued July 11, 1989.

The primary tape tab adhesive securement means 63 provides a layer of adhesive for securing at least a second area of the primary tape tab 60 to other portions of the diaper 20. The primary tape tab adhesive securement means 63 may also provide an attachment means for attaching the connective portion 78 of the primary tape tab 60 to the first fixed portion 74 and the second fixed portion 76, a means for joining the first fastening element 62 to the primary tape tab 60, and/or a disposal means for securing the diaper 20 in a configuration for disposal so as to contain the contents of the soiled diaper and provide convenient disposal of the diaper 20. Thus, the primary tape tabs adhesive securement means 63 are any of those adhesives which provide an adequate bond with other portions of the diaper, and preferably is any of the pressure-sensitive adhesives well-known to those of ordinary skill in the adhesive art. The primary tape tab adhesive securement means 63 most preferably comprises a pressure-sensitive adhesive such as code number XPF 1.42.34 available from The Minnesota Mining and Manufacturing Company, St. Paul, Minnesota.

While the primary tape tab adhesive securement means 63 may be disposed anywhere on the fastening surface 70 of the primary tape tab 60, the primary tape tab adhesive securement means 63 is preferably disposed entirely on the connective portion 78 (user's end) of the primary tape tab 60. Additionally, while the primary tape tab adhesive securement means 63 may be disposed anywhere on the first surface 79 of the connective portion 78 of the primary tape tab 60 such as adjacent the

distal edge 81 or in the middle section of the connective portion 78, the primary tape tab adhesive attachment means 63 is preferably disposed adjacent the first fastening element 62 and, more preferably, on at least a second area of the fastening surface 70.

As shown in the drawings, the primary tape tab adhesive securement means 63 is disposed on at least a second area of the fastening surface 70 of the primary tape tab 60. The second area is defined by the total exposed area of adhesive disposed on the fastening surface 70 or the first surface 79 of the connective portion 78 of the primary tape tab 60. Thus, the second area generally defines the area of the fastening surface 70 or the first surface 79 of the connective portion 78 not having a first fastening element 62 positioned on it such that that primary tape tab adhesive securement means 63 is capable of being adhered to other portions of the diaper 20. The second area can thus comprise one or more areas of adhesive and can have any desired shape, for example, rectangular, square, circular, oval, triangular, trapezoidal or any combination of shapes. In a preferred embodiment of the present invention as shown in Figure 4, the second area will be rectangular-shaped.

While the first area and the second area are generally contiguous and together comprise about 100% of the total surface area available on the fastening surface 70 or the first surface 79 of the connective portion 78, the first area and the second area do not necessarily have to comprise 100% of the total surface area. For example, portions of the fastening surface 70 or the first surface 79 of the connective portion 78 may have neither a primary tape tab adhesive securement means 63 nor a first fastening element 62 disposed on it. This portion of the primary tape tab 60 may have nothing, some other fastening means, or release means disposed on it. Generally, however, the first area and the second area comprise about 100% of the total surface area of the first surface 79 of the connective portion 78 of the primary tape tab 60 so that the fastening surface 70 of the user's end consists of the primary tape tab adhesive securement means 63 and the first fastening element 62.

As previously mentioned, the primary tape tab adhesive securement means 63 is disposed on at least a second area of the fastening surface 70. Thus, the primary tape tab adhesive securement means 63 may be disposed on other areas of the fastening surface 70 of the primary tape tab 60. For example, the primary tape tab adhesive securement means 63 may be disposed adjacent the area of joinder 80 of the primary tape tab 60, the primary tape tab adhesive securement means 63 being covered by the first fixed portion 74. Addition-

ally, the primary tape tab adhesive securement means 63 may be positioned subjacent the first fastening element 62 to join the first fastening element 62 to the primary tape tab 60, the primary tape tab adhesive securement means 63 being covered by the first fastening element 62. The primary tape tab adhesive securement means 63 may also be positioned adjacent the distal edge 81 of the primary tape tab 60 to form the grip tab 83. Thus, in preferred embodiments of the present invention, the primary tape tab adhesive securement means 63 is disposed in more than the second area of the primary tape tab 60, and is most preferably positioned on the entire first surface 79 of the connective portion 78 so as to act not only as a securement means but also as an attachment means for the first fixed portion 74, as a means for joining the first fastening element 62 to the primary tape tab 60, and as a means for creating the grip tab 83.

As will be discussed in greater detail hereinafter, the primary tape tab adhesive securement means 63 provides a disposal means to allow the diaper 20 to be secured in a configuration for disposal so as to allow the diaper to be conveniently thrown away in a waste receptacle. For example, if the first fastening element 62 is affixed to the fastening surface 70, the exposed portion of the primary tape tab adhesive securement means 63 in the second area may be affixed to portions of the other primary tape tab 60 or to the body portion 22 of the diaper 20 such as the backsheet 30 so as to secure the diaper 20 in its disposal configuration. Examples of how a diaper may be configured for disposal and of disposal means are shown in European Patent Publication No. 0,321,234.

As shown in the drawings, the tape fastener system 24 of the present invention further comprises a secondary tape tab 61 joined to the primary tape tab 60. Any of the well known configurations and constructions of a tape tab which were previously discussed with reference to the primary tape tab 60 may be used. Moreover, the secondary tape tab 61 can have any desired shape, for example, rectangular, square, circular, oval, triangular, trapezoidal or any combination of shapes. However, in the preferred embodiments of the present invention as shown in the drawings, the secondary tape tab 61 will be rectangular shaped with dimensions approximately the same as the fastening surface 70 of the primary tape tab 60. A particularly preferred secondary tape tab 61 is illustrated in Figure 2 and has a fastening surface 71 and a backing surface 73. The fastening surface 71 is that surface of the secondary tape tab 61 designed to secure the secondary tape tab 61 to other portions of the diaper 20. The secondary tape tab

adhesive securement means 65 is associated with and disposed on at least a portion of the secondary tape tab fastening surface 71. Preferably, the secondary tape tab adhesive securement means 65 are any of the pressure-sensitive adhesives well known to those of ordinary skill in the adhesive art for providing an adequate bond, such as Code Number XPF 1.42.34 available from The Minnesota Mining and Manufacturing Company, St. Paul, Minnesota. The secondary tape tab backing surface 73 is that surface opposite of the secondary tape tab fastening surface 71.

As illustrated in Figure 3, the secondary tape tab 61 has a fixed end 67 and a free end 69, wherein the fixed end 67 is hingeably affixed to the primary tape tab 60. The term "hingeably affixed" as used herein, refers to configurations wherein the fixed end 67 of the secondary tape tab 61 is pivotally attached or joined to the primary tape tab 60 in such a manner that enables the free end 69 of the secondary tape tab 61 to be peeled away from the primary tape tab 60. Figure 3 is a cross-sectional view of the tape fastening system 24 of the present invention, showing the free end 69 of the secondary tape tab 61 peeled away from the primary tape tab 60. The fixed end 67 of the secondary tape tab 61 may be directly joined to the primary tape tab 60 or may be indirectly joined to the primary tape tab 60, such as by affixing the fixed end 67 of the secondary tape tab 61 to an intermediate member (e.g., the inside and/or outside surface of the body portion of the diaper) which in turn is affixed to the primary tape tab 60. Preferably, the fixed end 67 of the secondary tape tab 61 is directly affixed to the primary tape tab 60 by secondary tape tab adhesive securement means 65, although any other adhesive attachment means as is known in the art for providing an adequate bond may be used to join the fixed end 67 of the secondary tape tab 61 to the primary tape tab 60.

The fixed end 67 of the secondary tape tab 61 may be joined to any portion of the primary tape tab 60. Preferably, the fixed end 67 of the secondary tape tab 61 is joined to the primary tape tab 60 adjacent the longitudinal edge 40 of the diaper 20 or adjacent the distal edge 81 of the primary tape tab 60, depending on the particular configuration of the tape fastener system. For example, in the configuration shown in Figures 2 and 3, the secondary tape tab 61 overlays the primary tape tab adhesive securement means 63, and the fixed end 67 of the secondary tape tab 61 is hingeably affixed to the primary tape tab 60 adjacent the first fastening element 62. In an alternate preferred embodiment, illustrated in Figure 5, the fixed end 67 of the secondary tape tab 61 is hingeably affixed to the primary tape tab 60 adjacent the longitudinal

edge 40 of the body portion 22 of the diaper 20. The secondary tape tab 61 may also be positioned subjacent the primary tape tab 60, as shown in Figure 6. In the tape fastener configuration illustrated in Figure 6, the fixed end 67 of the secondary tape tab 61 is hingeably affixed to the primary tape tab 60 adjacent the longitudinal edge 40 of the body portion 22 of the diaper 20. Further, as shown in Figure 6, the fixed end 67 of the secondary tape tab 61 may also be hingeably affixed to the outside surface 46 of the body portion 22 of diaper 20. In this configuration, the secondary tape tab 61 preferably extends laterally outward of the distal edge 81 of the primary tape tab 60. Alternately, the fixed end 67 of the secondary tape tab 61 can also be hingeably affixed to the primary tape tab 60 at the distal edge 81 of the primary tape tab 60, subjacent the first fastening element 62.

The free end 69 of the secondary tape tab 61 is opposite the fixed end 67 and is not joined or attached to the primary tape tab 60. Preferably, the free end 69 has a grip tab 85 located at the distal edge 87 of the secondary tape tab 61. The distal edge 87 of the secondary tape tab 61 is that edge which is furthest away from where the fixed end 67 of the secondary tape tab 61 is joined to the primary tape tab 60. The secondary tape tab grip tab 85 may be formed by folding over a small margin of the distal edge 87 of the secondary tape tab 61 and attaching it to itself. This forms a tab on the free end 69 of the secondary tape tab 61 which is easier to grasp by the diaper user when the free end 69 of the secondary tape tab 61 is to be peeled away from the primary tape tab 60.

Figures 2, 3 and 5 illustrate preferred embodiments of the tape fastener system 24 of the present invention wherein the secondary tape tab 61 overlays the primary tape tab adhesive securement means 63. In these preferred embodiments, the backing surface 73 of the secondary tape tab 61 is oriented toward the fastening surface 70 of the primary tape tab 60, so that when the free end 69 of the secondary tape tab 61 is peeled away from the primary tape tab 60, the primary tape, tab adhesive securement means 63 will be exposed. The exposed primary tape tab adhesive means 63 may then be used to secure the diaper in its disposable configuration by securing the adhesive securement means 63 to the other tape tab fastening system 24, to the backsheet 30, or to any other portion of the diaper. In these preferred embodiments, the secondary tape tab adhesive securement means 65 can be thought of as an initial adhesive means available for disposal of the absorbent article and the primary tape tab adhesive securement means 63 as a reserve or protected adhesive securement means. Thus, use of the "initial" adhesive securement means 65 on the secon-

primary tape tab 61 for disposal of the diaper is convenient and simple, requiring no additional effort. However, if the adhesive securement means 65 on the secondary tape tab 61 becomes contaminated (e.g., by baby powder and/or oil) and loses its adhesive properties, the free end 69 of the secondary tape tab 61 can be peeled away from the primary tape tab 60 to expose the "reserve/protected" primary tape tab adhesive securement means 63 which can then be used to secure the absorbent article in its disposal configuration as discussed above.

In an alternate preferred embodiment of the present invention, illustrated in Figure 6, the secondary tape tab 61 is positioned subjacent the primary tape tab backing surface 72. In this alternate embodiment, the fastening surface 71 of the secondary tape tab 61 is oriented toward the backing surface 72 of the primary tape tab 60 so that when the free end 69 of the secondary tape tab 61 is peeled away from the primary tape tab 60, the secondary tape tab adhesive securement means 65 will be exposed. The exposed secondary tape tab adhesive securement means 65 may then be used to secure the diaper in its disposable configuration by securing the secondary tape tab adhesive securement means 65 to the other tape tab fastening system 24, to the backsheet 30, or to any other portion of the diaper. In this configuration, the primary tape tab adhesive securement means 63 can be thought of as an initial adhesive means available for disposal of the diaper and the secondary tape tab adhesive securement means 65 as a reserve or protected adhesive securement means. Thus, use of the "initial" adhesive securement means 63 on the primary tape tab 60 for disposal of the diaper is convenient and simple, requiring no additional effort. However, if the adhesive securement means 63 on the primary tape tab 60 becomes contaminated (e.g., by baby powder and/or oil) and loses its adhesive properties, the secondary tape tab 61 may be peeled away from the primary tape tab 60 to expose the secondary tape tab adhesive securement means 65 which can then be used to secure the absorbent article in its disposal configuration.

As previously mentioned, the secondary tape tab adhesive securement means 65 is disposed on at least a portion of the secondary tape tab fastening surface 71. Preferably, the secondary tape tab adhesive securement means 65 comprises approximately 100% of the total surface area of the fastening surface 71. In addition, the secondary tape tab adhesive securement means 65 may be disposed on other areas of the secondary tape tab 61. For example, the secondary tape tab adhesive securement means 65 may be disposed on the area of joinder of the fixed end 67 of the secondary tape tab 61 to the primary tape tab 60 to join the tape

tabs together. The secondary tape tab adhesive securement means 65 may also be positioned adjacent the distal edge 87 of the secondary tape tab 61 to form the grip tab 85. Thus, in preferred embodiments of the present invention, the secondary tape tab adhesive securement means 65 is disposed on the entire fastening surface of the secondary tape tab 61, and is most preferably positioned on the entire first surface of the secondary tape tab 61 so as to act not only as an adhesive securement means but also as an attachment means for joining the fixed end of the secondary tape tab 61 to the primary tape tab 60, and as a means for creating the grip tab 85.

The landing member 64 of the tape fastener system 24 provides a means for securing itself and the primary tape tab 60 together to maintain the first end region 48 and the second end region 50 in an overlapping configuration. The landing member 64 may be disposed anywhere on the diaper 20 so long as it engages the primary tape tab 60 so as to maintain a side closure. For example, the landing member 64 may be disposed on the outside surface 46 in the second end region 50, on the inside surface 44 in the first end region 48, or on any other portion of the diaper 20 which is disposed to engage the primary tape tab 60. In addition, the landing member 64 may be a discrete separate element affixed to the diaper 20, a unitary piece of material that is neither divided nor discontinuous with an element of the diaper 20 such as the topsheet 26 or the backsheet 30, or a combination of unitary and separate elements. While the landing member 64 can assume varying sizes and shapes, it preferably comprises a portion of the backsheet 30 and one or more separate patches of material positioned across the outside surface 46 of the body portion 22 in the second end region 50 to allow for maximum fit adjustment at the waist of the wearer. The preferred embodiment of the landing member 64 illustrated in Figures 1 and 7 comprises an elongated, rectangular-shaped, unitary element secured to the outside surface 46 of the body portion 22 in the second end region 50 across the width of the backsheet 30. Figure 7 is a perspective view showing the diaper of Figure 1 in the configuration it would assume when placed on a wearer with the first fastening element 62 of the primary tape tab 60 engaged with landing member 64.

The landing member 64 preferably comprises a second fastening element 66 engageable with the first fastening element 62 of the primary tape tab 60. Thus, the second fastening element 66 may be manufactured from a wide range of materials and configurations capable of securely engaging the first fastening element 62. For example, the second fastening element 66 may comprise identical com-

plementary elements with the first fastening element 62 or distinct complementary elements with the first fastening element 62. As used herein, the term "identical complementary elements" is used to define mechanical fastening systems wherein the engaging elements of the first fastening element 62 and the second fastening element 66 comprise the same configuration or structure that are interlocking. Examples of such systems are described in U.S. Patent 4,322,875 entitled "Two Strip Materials Used For Forming Fasteners" issued to Brown et al. on April 16, 1982 and U.S. Patent 4,701,179 entitled "Fixed Position Fasteners For Disposable Absorbent Garments" issued to Kellenberger et al. on October 20, 1987. The term "distinct complementary elements" is used herein to designate a system wherein the first fastening element 62 is different from the second fastening element 66 but is engageable therewith such as buttons and holes, a hook fastening material and a loop fastening material, or a male member and a female member. Preferably, the second fastening element 66 comprises a loop fastening material, and the first fastening element 62 comprises a hook fastening material. As shown in Figures 1 and 7, the landing member 64 preferably comprises a second fastening element 66 comprising a plurality of fiber elements such as a loop fastening material 98.

The loop fastening material 98 of the second fastening element 66 provides a plurality of fiber elements that engage the engaging elements 86 of the hook fastening material 84. The loop fastening material 98 may be manufactured from a wide range of materials to provide fiber elements, preferably loops. Such suitable materials include nylon, polyester, polypropylene, for any combination of these materials. A suitable loop fastening material 98 comprises a number of fiber loops projecting from a woven backing such as the commercially available material designated "Scotchmate" brand nylon woven loop No. SJ3401 available from Minnesota Mining and Manufacturing Company, St. Paul, Minnesota. A preferred loop fastening material 98 comprises a tricot knit fabric having a plurality of nylon filament loops projecting from a backing of nylon such as the commercially available material designated "Guilford No. 16110" available from Guilford Mills of Greensboro, North Carolina. Alternatively, the loop fastening material 98 may be a non-woven fabric or any other type of fiber-material or loop material which are well known in the art. An inexpensive loop fastening material and a method of making such a loop fastening material is described in EP-A-0 289 198 entitled "Loop Fastening Material For Fastening Device And Method Of Making Same" filed April 24, 1987, by C. Locke Scripps and J. Richard Noel, which

application is incorporated herein by reference.

In use, the diaper 20 is applied to the wearer by positioning the first end region 48 under the wearer's back and drawing the remainder of the diaper 20 between the legs of the wearer so that the second end region 50 is positioned across the front of the wearer. The first fastening element 62 of the primary tape tabs 60 are then secured to the landing member 64 positioned on the outside surface 46 of the second end region 50 so that the first fastening element 62 will engage the second fastening element 66 to form a side closure as illustrated in Figure 7. After the diaper 20 has been soiled, the diaper 20 is removed from the wearer. The panels 51 in the second end region 50 may then be in-folded, and the body portion 22, beginning with the second end region 50, folded or rolled into a structure, such as shown in Figure 8, with the tape fastener system 24 comprising the primary tape tabs 60 and secondary tape tabs 61 extending outwardly from the rolled-up diaper 20. Figure 8 is a perspective view of the preferred embodiment of diaper 20 (illustrated in Figures 1-4) in its rolled-up configuration prior to use of the improved disposal means of the present invention. In the right tape fastener system 24 of Figure 8, the secondary tape tab 61 is shown overlaying the primary tape tab adhesive securement means 63. Whereas, in the left tape fastener system 24 of Figure 8, the free end 69 of the secondary tape tab 61 is shown peeled away from the primary tape tab 60, to expose the primary tape tab adhesive securement means 63. As illustrated in Figure 9, the primary tape tab adhesive securement means 63 on the left tape fastener system and the secondary tape tab adhesive securement means 65 on the right tape fastener system are then secured to either the other tape tab fastening system 24 or the body portion 22 such as the backsheet 30 so as to secure the diaper 20 in its rolled-up configuration so that it may be easily and conveniently disposed in a waste receptacle. Of course, if the secondary tape tab adhesive securement means 65 on the left tape fastener system is not contaminated, there would be no need for the user to peel it back. Conversely, if the secondary tape tab adhesive securement means 65 on the right tape fastener system is contaminated, the free end 69 can be peeled back to expose the underlying primary tape tab adhesive securement means 63.

Claims

1. A disposable absorbent article (20) comprising a body portion (22) having an inside surface (44), an outside surface (46) opposite of said inside surface, longitudinal edges (40), a first end region (48), and a second end region (50),



plementary elements with the first fastening element 62 or distinct complementary elements with the first fastening element 62. As used herein, the term "identical complementary elements" is used to define mechanical fastening systems wherein the engaging elements of the first fastening element 62 and the second fastening element 66 comprise the same configuration or structure that are interlocking. Examples of such systems are described in U.S. Patent 4,322,875 entitled "Two Strip Materials Used For Forming Fasteners" issued to Brown et al. on April 16, 1982 and U.S. Patent 4,701,179 entitled "Fixed Position Fasteners For Disposable Absorbent Garments" issued to Kellenberger et al. on October 20, 1987. The term "distinct complementary elements" is used herein to designate a system wherein the first fastening element 62 is different from the second fastening element 66 but is engageable therewith such as buttons and holes, a hook fastening material and a loop fastening material, or a male member and a female member. Preferably, the second fastening element 66 comprises a loop fastening material, and the first fastening element 62 comprises a hook fastening material. As shown in Figures 1 and 7, the landing member 64 preferably comprises a second fastening element 66 comprising a plurality of fiber elements such as a loop fastening material 98.

The loop fastening material 98 of the second fastening element 66 provides a plurality of fiber elements that engage the engaging elements 86 of the hook fastening material 84. The loop fastening material 98 may be manufactured from a wide range of materials to provide fiber elements, preferably loops. Such suitable materials include nylon, polyester, polypropylene, for any combination of these materials. A suitable loop fastening material 98 comprises a number of fiber loops projecting from a woven backing such as the commercially available material designated "Scotchmate" brand nylon woven loop No. SJ3401 available from Minnesota Mining and Manufacturing Company, St. Paul, Minnesota. A preferred loop fastening material 98 comprises a tricot knit fabric having a plurality of nylon filament loops projecting from a backing of nylon such as the commercially available material designated "Guilford No. 16110" available from Guilford Mills of Greensboro, North Carolina. Alternatively, the loop fastening material 98 may be a non-woven fabric or any other type of fiber-material or loop material which are well known in the art. An inexpensive loop fastening material and a method of making such a loop fastening material is described in EP-A-0 289 198 entitled "Loop Fastening Material For Fastening Device And Method Of Making Same" filed April 24, 1987, by C. Locke Scripps and J. Richard Noel, which

application is incorporated herein by reference.

In use, the diaper 20 is applied to the wearer by positioning the first end region 48 under the wearer's back and drawing the remainder of the diaper 20 between the legs of the wearer so that the second end region 50 is positioned across the front of the wearer. The first fastening element 62 of the primary tape tabs 60 are then secured to the landing member 64 positioned on the outside surface 46 of the second end region 50 so that the first fastening element 62 will engage the second fastening element 66 to form a side closure as illustrated in Figure 7. After the diaper 20 has been soiled, the diaper 20 is removed from the wearer. The panels 51 in the second end region 50 may then be in-folded, and the body portion 22, beginning with the second end region 50, folded or rolled into a structure, such as shown in Figure 8, with the tape fastener system 24 comprising the primary tape tabs 60 and secondary tape tabs 61 extending outwardly from the rolled-up diaper 20. Figure 8 is a perspective view of the preferred embodiment of diaper 20 (illustrated in Figures 1-4) in its rolled-up configuration prior to use of the improved disposal means of the present invention. In the right tape fastener system 24 of Figure 8, the secondary tape tab 61 is shown overlaying the primary tape tab adhesive securement means 63. Whereas, in the left tape fastener system 24 of Figure 8, the free end 69 of the secondary tape tab 61 is shown peeled away from the primary tape tab 60, to expose the primary tape tab adhesive securement means 63. As illustrated in Figure 9, the primary tape tab adhesive securement means 63 on the left tape fastener system and the secondary tape tab adhesive securement means 65 on the right tape fastener system are then secured to either the other tape tab fastening system 24 or the body portion 22 such as the backsheet 30 so as to secure the diaper 20 in its rolled-up configuration so that it may be easily and conveniently disposed in a waste receptacle. Of course, if the secondary tape tab adhesive securement means 65 on the left tape fastener system is not contaminated, there would be no need for the user to peel it back. Conversely, if the secondary tape tab adhesive securement means 65 on the right tape fastener system is contaminated, the free end 69 can be peeled back to expose the underlying primary tape tab adhesive securement means 63.

Claims

1. A disposable absorbent article (20) comprising a body portion (22) having an inside surface (44), an outside surface (46) opposite of said inside surface, longitudinal edges (40), a first end region (48), and a second end region (50),



said body portion (22) comprising a liquid pervious topsheet (26), a liquid impervious backsheet (30) joined to said topsheet, and an absorbent core (28) disposed between said topsheet (26) and said backsheet (30); and a tape fastening system (24) positioned on said body portion and comprising

(a) a primary tape tab (60) disposed adjacent each longitudinal edge (40) in said first end region (48), each of said primary tape tabs (60) comprising

(i) a fixed portion (74) attached to said body portion (22),

(ii) a connective portion (78) joined to said fixed portion (74) adjacent said longitudinal edge (40), said connective portion (78) having a fastening surface (70), a backing surface (72) opposite of said fastening surface (70), and a distal edge (81) spaced from said longitudinal edge of said body portion,

(iii) a first fastening element (62) disposed on a first area of said fastening surface (70), and

(iv) a primary tape tab adhesive securement means (63) associated with and disposed on at least a second area of said fastening surface (70) for adhesively securing at least said second area of said fastening surface (70) to another portion of the absorbent article

(b) at least one landing member (64) disposed said outside surface (48) in said second end region, (50), said landing member (64) comprising a second fastening element mechanically engageable with said first fastening element (62) to form a secure side closure for said absorbent article (20) characterised in that the absorbent article further comprises

(c) a secondary tape tab (61) joined to said primary tape tab (60), said secondary tape tab (61) comprising

(i) a fixed end (67) and a free end (69), said fixed end (67) being hingeably affixed to said primary tape tab (60) thereby enabling said free end (69) of said secondary tape tab (61) to be peeled away from said primary tape tab (60),

(ii) a secondary tape tab fastening surface (71) and a secondary tape tab backing surface (73) opposite of said fastening surface (71), and

(iii) a secondary adhesive securement means (65) associated with and disposed on at least a portion of said fastening surface (71) for adhesively securing said fastening surface (71) of said secondary

tape tab (61) to another portion of the absorbent article.

2. The absorbent article (20) of Claim 1 wherein said secondary tape tab (61) overlays said primary tape tab adhesive securement means (63) and wherein said backing surface (73) of said secondary tape tab (61) is oriented toward said fastening surface (70) of said primary tape tab (60) thereby enabling said free end (69) of said secondary tape tab (61) to be peeled away from said primary tape tab (60) to expose said primary tape tab adhesive securement means (63) when said secondary adhesive securement means (65) is no longer usable.
3. The absorbent article of Claim 1 wherein said secondary tape tab (61) is positioned subjacent said primary tape tab backing surface (72) and wherein said fastening surface (71) of said secondary tape tab (61) is oriented toward said backing surface (72) of said primary tape tab (60) so that said free end (69) of said secondary tape tab (61) may be peeled away from said primary tape tab (60) to expose said secondary tape tab adhesive securement means (65).
4. The absorbent article of Claim 2 or 3 wherein the fixed end (67) of said secondary tape tab (61) is hingeably affixed to said primary tape tab (60) adjacent said longitudinal edge (40) of said body portion (22) of said absorbent article (20).
5. The absorbent article of Claim 2 wherein said fixed end of said secondary tape tab (61) is hingeably affixed to said primary tape tab (60) adjacent said first fastening element (62).
6. The absorbent article of Claim 3 wherein the fixed end (67) of said secondary tape tab (61) is hingeably affixed to said primary tape tab (60) subjacent said first fastening element (62).
7. The absorbent article of any of Claims 1 - 6 wherein said first fastening element (62) is a separate element joined to said primary tape tab (60) by an adhesive attachment means.
8. The absorbent article of Claim 7 wherein said first fastening element (62) is affixed to said primary tape tab (60) by said primary tape tab adhesive securement means (63).
9. The absorbent article of Claim 7 or 8 wherein said first fastening element (62) is disposed



adjacent said distal edge (81) of said primary tape tab.

10. The absorbent article of any of Claims 1 - 9 wherein said first fastening element (62) and said second fastening element (64) are identical complementary elements. 5
11. The absorbent article of any of Claims 1 - 9 wherein said first fastening element (62) and said second fastening element (64) are distinct complementary elements. 10
12. The absorbent article of Claim 11 wherein said first fastening element (62) comprising a hook fastening material and said second fastening element (64) comprises a loop fastening material. 15
13. The absorbent article of Claim 3 wherein said secondary tape tab (61) extends laterally outward of said distal edge (81) of said primary tape tab. 20

Patentansprüche

1. Ein wegwerfbarer absorbierender Artikel (20), welcher einen Körperabschnitt (22) mit einer innenseitigen Oberfläche (44), einer der genannten innenseitigen Oberfläche gegenüberliegenden außenseitigen Oberfläche (46), Längsrändern (40), einem ersten Stirnbereich (48) und einem zweiten Stirnbereich (50), wobei der genannte Körperabschnitt (22) ein flüssigkeitsdurchlässiges Deckblatt (26), ein an das genannte Deckblatt angefügtes flüssigkeitsundurchlässiges Rückenblatt (30) und einen zwischen dem genannten Deckblatt (26) und dem genannten Rückenblatt (30) angeordneten absorbierenden Kern (28) umfaßt; und ein Bandbefestigungssystem (24) umfaßt, welches am genannten Körperabschnitt angeordnet ist und umfaßt: 25
 - (a) eine Hauptbandlasche (60), welche nahe jedem Längsrand (40) im genannten ersten Stirnbereich (48) angeordnet ist, wobei jede der genannten Hauptbandlaschen (60) umfaßt 30
 - (i) einen fixierten Abschnitt (74), welcher am genannten Körperabschnitt (22) befestigt ist, 35
 - (ii) einen Verknüpfungsabschnitt (78), welcher am genannten fixierten Abschnitt (74) nahe dem genannten Längsrand (40) angefügt ist, wobei der genannte Verknüpfungsabschnitt (78) eine Befestigungsoberfläche (70), eine der genannten Befestigungsoberfläche (70) gegen- 40

überliegende Stützoberfläche (72) und einen distalen Rand (81) aufweist, welcher vom genannten Längsrand des genannten Körperabschnitts beabstandet ist,

(iii) ein erstes Befestigungselement (62), welches an einem ersten Feld der genannten Befestigungsoberfläche (70) angeordnet ist, und

(iv) ein klebendes Befestigungsmittel (63) für die Hauptbandlasche, welches mit mindestens einem zweiten Feld der genannten Befestigungsoberfläche (70) verbunden und daran angeordnet ist, um mindestens das genannte zweite Feld der genannten Befestigungsoberfläche (70) an einem anderen Abschnitt des absorbierenden Artikels klebend zu fixieren,

(b) mindestens einen Auftreffbauteil (64), welcher an der genannten außenseitigen Oberfläche (46) im genannten zweiten Stirnbereich (50) angeordnet ist, wobei der genannte Auftreffbauteil (64) ein zweites Befestigungselement umfaßt, welches mit dem genannten ersten Befestigungselement (62) mechanisch in Eingriff bringbar ist, um einen sicheren Seitenverschluß für den genannten absorbierenden Artikel (20) zu bilden,

dadurch gekennzeichnet, daß der absorbierende Artikel weiters umfaßt

(c) eine Hilfsbandlasche (61), welche an die genannte Hauptbandlasche (60) angefügt ist, wobei die genannte Hilfsbandlasche (61) umfaßt

(i) ein fixiertes Ende (67) und ein freies Ende (69), wobei das genannte fixierte Ende (67) an der genannten Hauptbandlasche (60) klappbar fixiert ist, wobei dadurch das genannte freie Ende (69) der genannten Hilfsbandlasche (61) befähigt wird, um von der genannten Hauptbandlasche (60) weg abgezogen zu werden,

(ii) eine Befestigungsoberfläche (71) für die Hilfsbandlasche und eine der genannten Befestigungsoberfläche (71) gegenüberliegende Stützoberfläche (73) für die Hilfsbandlasche und

(iii) ein klebendes Hilfsbefestigungsmittel (65), welches mit mindestens einem Abschnitt der genannten Befestigungsoberfläche (71) verbunden und daran angeordnet ist, um die genannte Befestigungsoberfläche (71) der genannten Hilfsbandlasche (61) an einem anderen Abschnitt des absorbierenden Artikels klebend zu fixieren. 55



2. Der absorbierende Artikel (20) nach Anspruch 1, bei welchem die genannte Hilfsbandlasche (61) das genannte klebende Befestigungsmittel (63) für die Hauptbandlasche überdeckt und bei welchem die genannte Stützoberfläche (73) der genannten Hilfsbandlasche (61) gegen die genannte Befestigungsoberfläche (70) der genannten Hauptbandlasche (60) ausgerichtet ist, wobei dadurch das genannte freie Ende (69) der genannten Hilfsbandlasche (61) befähigt wird, von der genannten Hauptbandlasche (60) weg abgezogen zu werden, um das genannte klebende Befestigungsmittel (63) der Hauptbandlasche zu exponieren, wenn das genannte klebende Hilfsbefestigungsmittel (65) nicht länger brauchbar ist.

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3. Der absorbierende Artikel nach Anspruch 1, bei welchem die genannte Hilfsbandlasche (61) unterhalb der genannten Stützoberfläche (72) für die Hauptbandlasche liegend positioniert ist und bei welcher die genannte Befestigungsoberfläche (71) der genannten Hilfsbandlasche (61) gegen die genannte Stützoberfläche (72) der genannten Hauptbandlasche (60) ausgerichtet ist, sodaß das genannte freie Ende (69) der genannten Hilfsbandlasche (61) von der genannten Hauptbandlasche (60) weg abgezogen werden kann, um das genannte klebende Befestigungsmittel (65) für die Hilfsbandlasche zu exponieren.

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4. Der absorbierende Artikel nach Anspruch 2 oder 3, bei welchem das fixierte Ende (67) der genannten Hilfsbandlasche (61) an der genannten Hauptbandlasche (60) nahe dem genannten Längsrand (40) des genannten Körperabschnitts (22) des genannten absorbierenden Artikels (20) gelenkig fixiert ist.

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5. Der absorbierende Artikel nach Anspruch 2, bei welchem das genannte fixierte Ende der genannten Hilfsbandlasche (61) an der genannten Hauptbandlasche (60) nahe dem genannten ersten Befestigungselement (62) gelenkig fixiert ist.

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6. Der absorbierende Artikel nach Anspruch 3, bei welchem das genannte fixierte Ende (67) der genannten Hilfsbandlasche (61) an der genannten Hauptbandlasche (60) unterhalb dem genannten ersten Befestigungselement (62) gelenkig fixiert ist.

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7. Der absorbierende Artikel nach einem der Ansprüche 1 bis 6, bei welchem das genannte erste Befestigungselement (62) ein getrenntes Element ist, welches an der genannten Hauptbandlasche (60) durch ein klebendes Befestigungsmittel angefügt ist.

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8. Der absorbierende Artikel nach Anspruch 7, bei welchem das genannte erste Befestigungselement (62) an der genannten Hauptbandlasche (60) durch das genannte klebende Befestigungsmittel (63) für die Hauptbandlasche befestigt ist.

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9. Der absorbierende Artikel nach Anspruch 7 oder 8, bei welchem das genannte erste Befestigungselement (62) nahe dem genannten distalen Rand (81) der genannten Hauptbandlasche angeordnet ist.

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10. Der absorbierende Artikel nach einem der Ansprüche 1 bis 9, bei welchem das genannte erste Befestigungselement (62) und das genannte zweite Befestigungselement (64) identische komplementäre Elemente sind.

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11. Der absorbierende Artikel nach einem der Ansprüche 1 bis 9, bei welchem das genannte erste Befestigungselement (62) und das genannte zweite Befestigungselement (64) unterschiedliche komplementäre Elemente sind.

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12. Der absorbierende Artikel nach Anspruch 11, bei welchem das genannte erste Befestigungselement (62) ein Hakenbefestigungsmaterial umfaßt und das genannte zweite Befestigungselement (64) ein Schlaufenbefestigungsmaterial umfaßt.

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13. Der absorbierende Artikel nach Anspruch 3, bei welchem die genannte Hilfsbandlasche (61) sich quer auswärts vom genannten distalen Rand (81) der genannten Hauptbandlasche erstreckt.

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Revendications

1. Un article absorbant jetable (20) comprenant:

une partie de corps (22) ayant une surface interne (44), une surface externe (46) opposée à ladite surface interne, des bords longitudinaux (40), une première partie d'extrémité (48) et une seconde partie d'extrémité (50), ladite partie de corps (22) comprenant une feuille de dessus perméable aux liquides (26), une feuille de fond imperméable aux liquides (30) réunie à ladite feuille de dessus, et une âme absorbante (28) disposée entre ladite feuille de dessus (26) et ladite feuille de fond (30), et

un système de fixation par bande (24) disposé sur ladite partie de corps et comprenant:



(a) une première patte de bande (60) disposée près de chaque bord longitudinal (40) dans ladite première partie d'extrémité (48), chacune desdites premières pattes de bande (60) comprenant:

(i) une partie fixe (74) fixée à ladite partie de corps (22),

(ii) une partie de liaison (78) réunie à ladite partie fixe (74) près dudit bord longitudinal (40), ladite partie de liaison (78) ayant une surface de fixation (70), une surface de support (72) opposée à ladite surface de fixation (70), et un bord distal (81) espacé dudit bord longitudinal de ladite partie de corps,

(iii) un premier élément de fixation (62) disposé sur une première zone de ladite surface de fixation (70), et

(iv) un premier moyen de fixation adhésif de patte de bande (63) associé avec et disposé sur au moins une seconde zone de ladite surface de fixation (70) pour fixer de façon adhésive au moins ladite seconde zone de ladite surface de fixation (70) à une autre partie de l'article absorbant,

(b) au moins un élément de réception (64) disposé sur ladite surface externe (46) dans ladite seconde partie d'extrémité (50), ledit élément de réception (64) comprenant un second élément de fixation susceptible de s'engager mécaniquement avec ledit premier élément de fixation (62) pour former une fermeture latérale sûre pour ledit article absorbant (20),

caractérisé en ce que l'article absorbant comporte en outre:

(c) une seconde patte de bande (61) réunie à ladite première patte de bande (60), ladite seconde patte de bande (61) comprenant:

(i) une extrémité fixe (67) et une extrémité libre (69), ladite extrémité fixe (67) étant fixée de façon à être articulée sur ladite première patte de bande (60), de manière à permettre à ladite extrémité libre (69) de ladite seconde patte de bande (61) à être arrachée de ladite première patte de bande (60),

(ii) une seconde surface de fixation de patte de bande (71) et une seconde surface de support de patte de bande (73) opposée à ladite surface de fixation (71), et

(iii) un second moyen de fixation adhésif (65) associé avec et disposé sur au moins une partie de ladite surface de fixation (71) pour fixer de façon adhésive ladite surface de fixation (71) de ladite

seconde patte de bande (61) à une autre partie de l'article absorbant.

2. L'article absorbant (20) selon la revendication 1, dans lequel ladite seconde patte de bande (61) recouvre ledit premier moyen de fixation adhésif de patte de bande (63) et dans lequel ladite surface de support (73) de ladite seconde patte de bande (61) est orientée vers ladite surface de fixation (70) de ladite première patte de bande (60) en permettant ainsi à ladite extrémité libre (69) de ladite seconde patte de bande (61) d'être arrachée de ladite première patte de bande (60) pour exposer ledit premier moyen de fixation adhésif de patte de bande (63) lorsque ledit second moyen de fixation adhésif (65) n'est plus utilisable.

3. L'article absorbant selon la revendication 1, dans lequel ladite seconde patte de bande (61) est disposée sous ladite première surface de support de patte de bande (72) et dans lequel ladite surface de fixation (71) de ladite seconde patte de bande (61) est orientée vers ladite surface de support (72) de ladite première patte de bande (60), de telle sorte que ladite extrémité libre (69) de ladite seconde patte de bande (61) peut être arrachée de ladite première patte de bande (60) pour exposer ledit second moyen de fixation adhésif de patte de bande (65).

4. L'article absorbant selon la revendication 2 ou 3, dans lequel l'extrémité fixe (67) de ladite seconde patte de bande (61) est fixée de façon à être articulée à ladite première patte de bande (60) près dudit bord longitudinal (40) de ladite partie de corps (22) dudit article absorbant (20).

5. L'article absorbant selon la revendication 2, dans lequel ladite extrémité fixe de ladite seconde patte de bande (61) est fixée de façon à être articulée à ladite première patte de bande (60) près dudit premier élément de fixation (62).

6. L'article absorbant selon la revendication 3, dans lequel l'extrémité fixe (67) de ladite seconde patte de bande (61) est fixée de façon à être articulée à ladite première patte de bande (60) sous ledit premier élément de fixation (62).

7. L'article absorbant selon l'une quelconque des revendications 1-6, dans lequel ledit premier élément de fixation (62) est un élément séparé réuni à ladite première patte de bande (60) à



l'aide d'un moyen de fixation adhésif.

8. L'article absorbant selon la revendication 7, dans lequel ledit premier élément de fixation (62) est fixé à ladite première patte de bande (60) par ledit premier moyen de fixation adhésif de patte de bande (63). 5
9. L'article absorbant selon la revendication 7 ou 8, dans lequel ledit premier élément de fixation (62) est disposé près dudit bord distal (81) de ladite première patte de bande. 10
10. L'article absorbant selon l'une quelconque des revendications 1-9, dans lequel ledit premier élément de fixation (62) et ledit second élément de fixation (64) sont des éléments identiques, complémentaires. 15
11. L'article absorbant selon l'une quelconque des revendications 1-9, dans lequel ledit premier élément de fixation (62) et ledit second élément de fixation (64) sont des éléments distincts, complémentaires. 20
12. L'article absorbant selon la revendication 11, dans lequel ledit premier élément de fixation (62) comprend un matériau de fixation à crochets et ledit second élément de fixation (64) comprend un matériau de fixation à boucles. 25 30
13. L'article absorbant selon la revendication 3, dans lequel ladite seconde patte de bande (61) s'étend latéralement à l'extérieur dudit bord distal (81) de ladite première patte de bande. 35

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