

- [54] **TAPE FASTENING SYSTEM FOR DISPOSABLE DIAPER**
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- [52] **U.S. Cl. 128/284, 117/122 P, 161/406**
- [51] **Int. Cl. A61f 13/16**
- [58] **Field of Search 128/284, 287, 290, 286, 128/296, 156; 117/122 P; 161/39, 149, 406**

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3,620,217	11/1971	Gellert.....	128/284
3,630,201	12/1971	Endres.....	128/287
3,646,937	3/1972	Gellert.....	128/287

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Attorney, Agent, or Firm—E. Kelly Linman; Frederick H. Braun; John V. Gorman

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[57] **ABSTRACT**
 An improved tape fastener system for stronger securement of a tape fastener to corners of a disposable diaper, especially for diapers having relatively weak and/or extensible members. The tape fastener system has several elements which are parallel and are attached to the front and back surface of the diaper. The tape has a generally Y-shaped cross-section with two legs fastened to a back corner of the diaper and the third leg available to attach to a front corner of the diaper.

25 Claims, 7 Drawing Figures

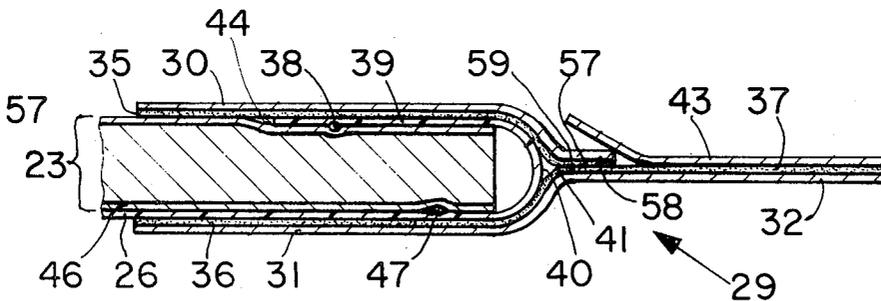


Fig. 1

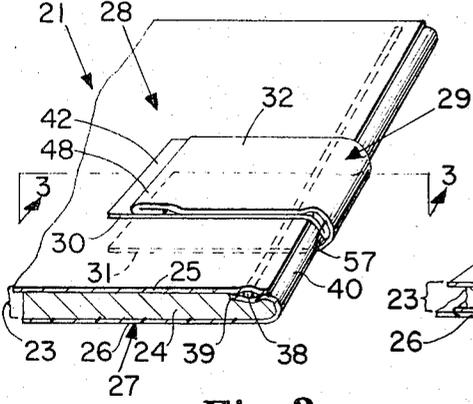


Fig. 2

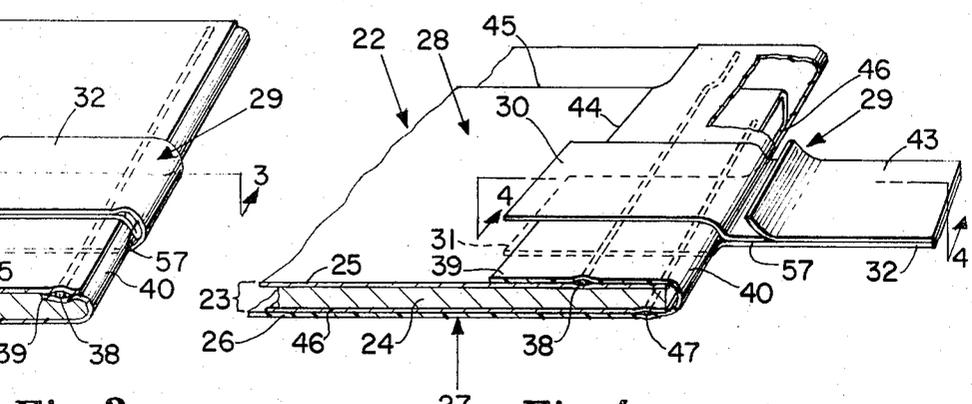


Fig. 3

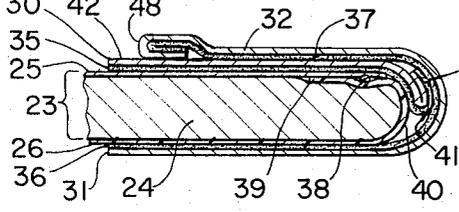


Fig. 4

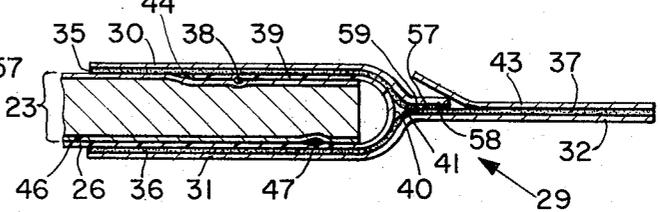


Fig. 7

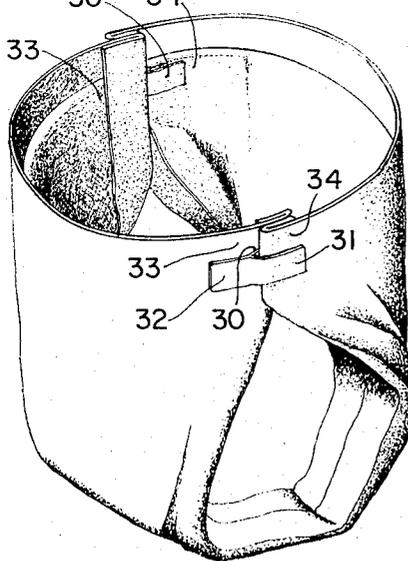


Fig. 5

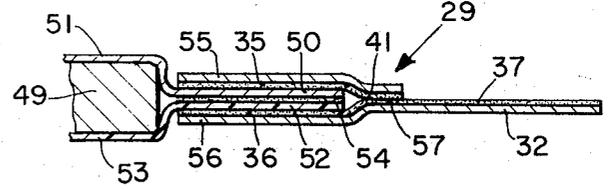
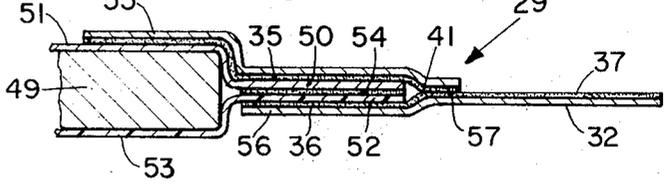


Fig. 6



TAPE FASTENING SYSTEM FOR DISPOSABLE DIAPER

BACKGROUND OF THE INVENTION

The use of pressure sensitive tape fasteners for securing the corners of a diaper is a well-known expedient in the art. In fact, an example of this type of device is described in U.S. Pat. No. Re. 26,151 entitled DISPOSABLE DIAPER which issued to Robert C. Duncan et al on Jan. 31, 1967. The Duncan et al patent is commonly owned by the assignee of the present application.

Previous tape fasteners have, however, had a number of shortcomings, one of which is that they are generally attached to only one surface of the diaper, generally the back surface, and thus all the force exerted on the tape fastener is directed to the single joint between the tape fastener and the back surface of the diaper. In addition, the most frequently used diaper construction places a relatively weak or extensible thermoplastic material on the back of the diaper. A back surface of this kind provides a generally unsatisfactory base for mounting a tape fastener. A tape fastener easily pulls out of such a back surface during the process of fastening a diaper, thereby leaving a hole in the backsheet of the diaper and leaving the user with an unusable fastener.

Such a failure wherein the tape fastener produces a hole in the backsheet is undesirable because the diaper is essentially not usable after this occurs. The backsheet is no longer moisture impervious and there is no readily available means to fasten the diaper on the baby since the tape fastener element has been destroyed and diaper pins are not usually kept on hand when diapers with tape fastening systems are used.

The manufacturer's joint, defined below, must be stronger than the user's joint, defined below, because the user puts more tensile force on the tape system in the process of fastening the diaper than is put on the tape during wearing of the diaper. The user pulls hard on the tape fastener while fastening a diaper, and it is generally during fastening that a tape pulls out of the diaper. Prior art diapers are subject to the "pull-out" type failure.

SUMMARY OF THE INVENTION

The nature and substance of the invention will be more readily appreciated after giving consideration to its major aims and purposes. The principal objects of the invention are recited in the ensuing paragraphs in order to give a better appreciation of the important aspects of the invention before describing the details of the preferred embodiment in later portions of the description.

The major object of the invention is to provide an improved tape fastener system for a disposable diaper which has a stronger manufacturer's joint, i.e., the attachment between the fastener tape and the diaper which is made by the manufacturer.

Another object of the invention is the provision of an improved fastener system of the above character which distributes the load exerted on the tape fastener at the manufacturer's joint over a larger area.

A further object of the invention is a provision of an improved fastener system of the above character

wherein the tape fastener is attached to several different materials in providing the manufacturer's joint.

An additional object of the invention is the provision of an improved tape fastener system of the above character wherein the adhesive on the fastening portion is covered for a distance outwardly from the edge of the diaper to reduce the potential adhesive exposure to an infant's leg during wearing.

These and other objects are achieved by providing an improved tape fastener system for a disposable diaper having a back surface and a front surface wherein the tape fastener system has a front surface portion, a first attachment means associated with the front surface portion and the front surface of the diaper to attach the front surface portion to the front surface, a back surface portion of the tape fastener, a second attachment means associated with the back surface portion and the back surface of the diaper to attach the back surface portion to the back surface, a fastening portion of the tape fastener, and a third attachment means associated with the fastening portion to attach the fastening portion to another part of the diaper and thereby form the user's joint, i.e., the joint made by the user when fitting and fastening a diaper to an infant. The front surface portion, the back surface portion and the fastening portion are joined and attached in an area of joinder adjacent the edge of the diaper so that the forces imposed on the fastening portion are transmitted to both front and back surfaces of the diaper.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter regarded as forming the present invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawing in which the thickness of some of the materials are exaggerated for clarity and in which:

FIG. 1 is a fragmentary perspective view of a corner of a disposable diaper to which the invention has been applied in one form;

FIG. 2 is a fragmentary perspective view, partially broken away, of a corner of a disposable diaper to which an alternate embodiment of the invention has been applied;

FIG. 3 is a cross-section in elevation of the corner of the diaper taken on the line 3—3 of FIG. 1;

FIG. 4 is a cross-section in elevation of the corner of the diaper taken on the line 4—4 of FIG. 2;

FIG. 5 is a cross-section in elevation, similar to FIGS. 3 and 4, showing an alternate diaper construction with a tape fastener system of this invention;

FIG. 6 is a cross-section in elevation, similar to FIG. 5, of an alternate embodiment of a tape fastener system of this invention; and

FIG. 7 is a perspective view showing a form of a disposable diaper illustrating the improved tape fastener system when in use for holding adjoining diaper corners.

DETAILED DESCRIPTION OF THE INVENTION

Pressure sensitive tape fasteners of the invention are useful and beneficial when applied to conventional disposable diapers, particularly of the kind that have a plastic backing sheet. As an illustration of the kind of diaper to which the invention is very readily adapted,

reference is again made to the above cited Duncan et al U.S. Pat. No. Re. 26,151 which is incorporated herein by reference. It will be apparent from the following description that the tape fastener illustrated and described herein may be applied to the corner of a diaper of that particular design and configuration. On the other hand, it will be understood that the invention is not limited to any specific diaper structure or configuration and the diaper of the Duncan et al patent is merely a typical example of the kind of diaper to which the present invention can be usefully applied.

Referring now to FIGS. 1 and 2 of the drawing, it will be noted that these views represent the back corner portion 21 and 22 of a diaper in FIGS. 1 and 2, respectively, each corner portion having an absorptive body 23. The absorptive body 23 has an absorptive core 24 formed from any of the well-known materials having good moisture absorbing characteristics such as absorbent wadding, cellulose fluff or the like. The absorptive body 23 may also include a topsheet 25 superposed over the absorptive core 24. The topsheet 25 may be any of the well-known topsheets, for example, that topsheet described in the above cited Duncan et al patent which is a hydrophobic nonwoven material. These diapers generally have a moisture impervious backsheet 26, some of which are thin, flexible, extensible materials, such as 1 1/2 mil polyethylene film.

Such a diaper has a back surface 27 and a front surface 28. When a backsheet 26 is used, it forms the back surface 27 of the diaper. The front surface 28 is that surface of the diaper opposite the back surface 27 and in the embodiment of FIG. 1 is formed by the topsheet 25. In general, the back surface of the diaper extends from one lateral edge to the other lateral edge of the diaper and from one longitudinal end to the other longitudinal end of the diaper and is the surface furthest from a baby during wearing of a diaper. In general, the front surface 28 of the diaper is that area coextensive with the back surface 27 and which is for the greater part in contact with an infant when the diaper is worn.

Referring again to FIGS. 1 and 2, several embodiments of the tape fastener system 29 of this invention are shown. This tape fastener system is one which is anchored to both the front surface 28 and the back surface 27 of a diaper to create the "manufacturer's" joint, i.e., that attachment of the tape fastener system to the diaper made during manufacture of the diaper. The tape fastener system has another element which forms the "user's" joint, i.e., that joint made by the person fitting and securing a diaper to an infant. The tape fastener system 29 of this invention has at least three elements, which are the front surface portion 30, the back surface portion 31, and the fastening portion 32. The front surface portion 30 is that portion of the tape fastener system which is attached to the front surface 28 of the diaper. The back surface portion 31 is that portion of the tape fastener system which is attached to the back surface 27 of the diaper. The fastening portion 32 is that portion of the tape fastening system which is attached to another portion of the diaper, generally the front corner or adjacent corner 33 of a diaper such as is shown in FIG. 7, by the user when securing a diaper on an infant after it is fitted to the infant. The fastening portion 32 is used in forming the user's joint. The front corner 33 is in contrast to the back corner 34 such as is shown in FIG. 7. The back corner 34 and front cor-

ner 33 are designated as such in that they are a corner on the back portion and the front portion, respectively, of the diaper before the diaper is fitted to an infant.

The front surface portion 30, the back surface portion 31, and the fastening portion 32 meet and are joined in an area of joiner 57. The attachment between these three portions is strong in the area of joiner 57. Preferably, the attachment between the various components of the tape of this invention is subjected to shear stresses, rather than peel stresses, when a tensile force away from lateral edge 40 of the diaper is put on fastening portion 32.

The stresses put on the area of joiner 57 are shear stresses. When the tape is in its "in use" configuration, as is shown in FIG. 7, the segments of the front surface portion 30, the back surface portion 31, and the fastening portion 32 coextensive with the area of joiner 57 are parallel with each other and each of the segments coextensive with the area of joiner 57 extend laterally outwardly from the first common point of joiner 41 when the tape is in its "in use" configuration.

Looking at FIG. 4 wherein the tape is shown in substantially its "in use" configuration, the segments of the top surface portion 30 and the bottom surface portion 31 (bottom surface portion 31 being integral with the fastening portion 32) which are coextensive with the area of joiner 57 extend laterally outwardly, i.e., to the right in FIG. 4, from the first common point of joiner 41. In addition, the lower surface 58 of the front surface portion 30 is facing the upper surface 59 of the back surface portion 31 and the fastening portion 32, which are integral, in the region of the area of joiner 57. This structure puts the area of joiner 57 in shear when a tensile force is put on the fastening portion 32 in contrast to a peel stress which is put on the area of joiner in a tape system wherein the upper surface of the top surface portion is facing the upper surface of the back surface portion such as is taught in U.S. Pat. No. 3,646,937, issued to Gellert on Mar. 7, 1972, and is commonly owned by the assignee of the present application.

Referring now to FIG. 3, which is a section of the diaper corner shown in FIG. 1, additional detail of the tape fastener system 29 is shown. The backsheet 26 in this diaper embodiment is folded around and onto the top of the lateral edge 40 of the absorptive core 24 to form a side flap 39. The side flap 39 is attached to the topsheet 25 by flap securement means 38. The flap securement means 38 can be any of the adhesives well-known to those of ordinary skill in the art, such as hot melt glues and double sided adhesive tapes. The flap securement means 38 is generally parallel to and adjacent to the lateral edge 40 of the diaper as is well shown in FIG. 1.

FIG. 3 also shows attachment means for securing the tape fastener system to a diaper. These attachment means are any of those 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 front surface portion 30 is fixed to the front surface 28 of the diaper by a first attachment means 35. The back surface portion 31 is attached to the back surface 27 of the diaper by a second attachment means 36. The fastening portion 32 of the tape fastener system has a third attachment means 37 connected to and associated therewith. This third attachment means 37 forms a joint between the fastening por-

tion 32 and a front corner 33 of a diaper when the diaper is in its "in use" configuration as shown in FIG. 7.

Additional features may be incorporated with this improved tape fastener system. Referring now to FIG. 4, the first common point of joinder 41 for the front surface portion 30, back surface portion 31, and fastening portion 32 of the tape fastener system 29 preferably lies in a plane midway between the front and back surfaces of the diaper. The first common point of joinder 41 is, in general, the common meeting of the three basic tape elements, the top surface portion, the back surface portion, and the fastening portion, nearest the lateral edge 40 of the diaper. These portions of the tape system thus preferably come together at a point which is about equidistant from the front surface 28 and back surface 27 of the diaper. This provides equal distribution of strain to both the front and back surfaces of a diaper resulting from a force applied to the fastening portion 32. Of course, if it is desirable to allocate the distribution of strain to the front and back surfaces of the diaper in some other manner, the first common point of joinder 41 can be positioned elsewhere, e.g., in the same plane as the front or back surface of the diaper.

Referring now to FIGS. 1 and 3, it is seen that the fastening portion 32 with its associated third attachment means 37 is folded on top of the front surface portion 30 such that the fastening portion 32 is superposed on the front surface portion 30. Since in the preferred embodiment the third attachment means 37 is one of the well-known pressure sensitive adhesives, the upper surface 42 of the front surface portion 30 is preferably silicone treated so that it has moderate adhesive attachment to the third attachment means 37 and thereby provides a release liner for the fastening portion 32 with its third attachment means 37.

When the fastening portion 32 is superposed on the front surface portion 30 and the upper surface 42 of the front surface portion 30 is treated to provide a release liner, it is important that the third attachment means 37 be isolated from contacting any of the front surface 28 of the diaper. This isolation is required in order to provide easy releasability of the fastening portion 32 when the diaper is to be fitted and secured to an infant. This isolation can be insured by making the area of the upper surface 42 at least as great as and coextensive with the area of the third attachment means 37. In fact, it is desirable that the upper surface 42 of the front surface portion 30 be somewhat larger than the effective area of the third attachment means 37. In FIGS. 1 and 3 it is shown that the front surface portion 30 is longer than fastening portion 32. This structure forms a discontinuity to provide a fastening portion 32 which is easier to grip and lift.

An alternate embodiment to that just described for protecting a third attachment means 37 until the diaper is to be attached to an infant is shown in FIGS. 2 and 4. In this embodiment, a separate release liner 43 is provided to cover the third attachment means 37. The release liner may be polyethylene or paper or any suitable equivalent thereof that will provide protection. The release liner 43 is again treated on its surface which contacts the third attachment means 37 so that it has moderate adhesive attachment to the third attachment means 37. A silicone treatment has been

found to provide this moderate adhesive attachment with pressure sensitive adhesives.

On some diapers the backsheets 26 has a narrow lateral margin folded around and over the lateral edge 40 of the absorptive body 23 to form the side flap 39 shown in FIGS. 2 and 4. In this instance, it is preferable that the side flap 39 be attached to the absorptive body 23 by flap securement means 38. In the attached figures, the side flap 39 is shown attached to the topsheet 25. The flap securement means 38 can be any of those well-known to those of ordinary skill in the art, for example, double-sided tapes and hot melt glues.

In addition, when the diaper incorporates a side flap 39 superposed on the topsheet 25 such as is shown in FIGS. 2 and 4, it is desirable (but not essential if flap securement means 38 is used to provide a "support" glue line) that the front surface portion 30 and its associated attachment means 35 extend beyond the inward margin 44 of the side flap 39 and be in contact with the topsheet 25. Thus in a diaper having a side flap 39 such as shown in FIGS. 2 and 4, the front surface portion 30 can be attached to only the side flap 39, only the topsheet 25, or both the side flap 39 and the topsheet 25.

Another refinement in diaper construction which provides a stronger diaper in connection with the improved tape fastener system of this invention is shown in FIGS. 2 and 4. The topsheet 25 has a longitudinal dimension longer than the longitudinal dimension of the absorptive core 24. This greater length of the topsheet 25 is folded around and under the longitudinal end 45 of the absorptive core 24 to provide a folded under portion 46 of the topsheet 25. The folded under portion 46 forms a waistband element, at the longitudinal end of a diaper, which provides a strong member to which a fastening system can be attached. The folded under portion 46 traverses the width of the diaper and has a longitudinal length sufficient so that it is included between the front surface portion 30 and the back surface portion 31 of the tape fastener system 29 of this invention.

A waistband element can be formed by various other members as part of the absorptive body. For example, wet strength tissue or other layers, not shown in the drawing, having high tensile strength which underlie the absorptive core, i.e., on the side of the absorptive core opposite the topsheet, and extend across the width of the diaper could form a waistband element.

The additional strength available by providing a folded under portion 46 can be acquired by fastening the backsheets 26 to the folded under portion 46 with tape support means 47. Tape support means 47 can be any attachment means compatible with both the backsheets 26 and the folded under portion 46, such as hot melt glues. Tape support means 47 is positioned so that it falls within the area projected by the back surface portion 31 onto the folded under portion 46. A tape support means 47 is especially beneficial at the back corners of the diaper such as back corner 34.

The tape fastener system 29 of this invention can be constructed in several ways. Its three main elements, i.e., the front surface portion 30, the back surface portion 31, and the fastening portion 32, can each be separate tapes which meet and are joined adjacent the lateral edge 40 of the diaper. A more practical structure for this tape fastener system 29 is one in which the fastening portion 32 and either the back surface portion

31 or the front surface portion 30 is an integral strip of tape material. If the fastening portion 32 is integral with the back surface portion 31 as shown in the attached drawing, then the front surface portion 30 is a separate element which is attached to the combined fastening portion 32 and back surface portion 31 at the lateral edge 40 of the diaper. This is easily accomplished by mating the first attachment means 35 of the front surface portion 30 with the second attachment means 36 and the third attachment means 37, the second and third attachment means being generally the same when the fastening portion 32 and the back surface portion 31 are integral.

When the front surface portion 30 and the fastening portion 32 are integral, the first attachment means 35 must be placed on one side of the tape while the third attachment means 37 must be placed on the opposite side of the tape and the back surface portion 31 is joined with that tape adjacent the lateral edge 40 of the diaper.

In many diaper constructions, for example, that taught in the above mentioned Duncan et al patent, the topsheet is one of the strongest, if not the strongest, component of the diaper. When this is the case, the strongest tape attachment can be achieved by insuring that the tape fastening system is attached either directly or indirectly to the topsheet. A tape fastening system can indirectly be attached to a topsheet through, for example, flap securement means 38 and tape support means 47.

Another beneficial structure for a tape fastener system such as that of this invention, is shown in FIGS. 1 and 3. This structure is a grip tab 48 at the distal end of the fastening portion 32. The grip tab 48 in this instance was formed by folding over a small margin of the distal end of the fastening portion and attaching it to itself. This forms an end on the fastening portion 32 which is easier to grasp by the diaper user when the diaper is to be fitted and attached to an infant. It is most beneficial when used with a fastening portion 32 which is superposed on the front surface portion 30.

FIGS. 5 and 6 show the tape fastener system 29 applied to an alternate diaper construction wherein the absorptive core 49 does not extend to the lateral edges of the diaper and the lateral extension 50 of the topsheet 51 is attached to the lateral extension 52 of the backsheet 53 by securement means 54, e.g., hot melt adhesives, double sided adhesive tapes, fusion of the lateral extensions, etc., associated with the lateral extensions 50 and 52 for holding them together. In this construction the front surface portion 55 and the back surface portion 56 of the tape fastener system can be attached to the respective diaper surfaces primarily in the lateral extension portion of the diaper as shown in FIG. 5. In some instances, it is found to be advantageous to make the front surface portion 55 longer in its transverse dimension, i.e., the dimension parallel to the width of the diaper, than the transverse dimension of the back surface portion 56 as is shown in FIG. 6. For example, it may be desirable that the front surface portion 55 overlies some of the absorptive core 49 of the diaper such as is shown in FIG. 6 or that the front surface portion extends beyond an element — such as a side flap 39 in FIG. 3 — which forms part of the front surface of the diaper. Thus, the transverse dimension of the front surface portion may be longer than the transverse dimension of the back surface portion; in fact, it

may be at least about twice as long as the transverse dimension of the back surface portion.

The preferred embodiment of this tape fastener system with regard to the location of the first common point of joinder 41 is also shown in both FIGS. 5 and 6. This preferred embodiment is that the first common point of joinder 41 is adjacent to the lateral edge of the diaper and is substantially in a plane equidistant between the front surface of the diaper and the back surface of the diaper.

Any of the back surface portion, the front surface portion, or the fastening portion of this tape fastener system and their attachment means can be pressure sensitive tapes as are well-known to those of ordinary skill in the art. Any of these pressure sensitive tapes are preferably a paperbacked tape but can also be any one of several well-known commercial types including types having a polyethylene backing. In either case, these tapes can be with or without reinforcing elements. The pressure sensitive adhesive on these tapes is preferably selected so that it will be least irritating to a baby's tender skin.

In practice, the back surface portion and the fastening portion — as separate pieces or as an integral piece — and their associated attachment means may be a saturated creped paper tape having a pressure sensitive adhesive tailored to bond to polyethylene, such as tape No. Y-9030 available from the Minnesota Mining and Manufacturing Co. The front surface portion in the embodiment of FIG. 1, i.e., having its upper surface treated to provide a release liner, and its associated attachment means can be a polypropylene film having a pressure sensitive adhesive tailored to bond to polyethylene and having a silicone release coating on its upper surface to provide easy release, such as tape No. Y-9376 or tape No. Y-840 available from the Minnesota Mining and Manufacturing Co.

Thus it is apparent that there has been provided, in accordance with the invention, an improved tape fastener system that fully satisfies the objects, aims, and advantages set forth above. While the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications, and variations as fall within the spirit and broad scope of the appended claims.

What is claimed is:

1. In a disposable diaper having a back surface and a front surface, an improved tape fastener system, comprising:

- a. a front surface portion;
- b. first attachment means associated with the front surface portion and the front surface of the diaper for attaching the front surface portion to the front surface;
- c. a back surface portion;
- d. second attachment means associated with the back surface portion and the back surface of the diaper for attaching the back surface portion to the back surface;
- e. a fastening portion; and
- f. third attachment means associated with the fastening portion for attaching the fastening portion to another part of the diaper;

g. the front surface portion, the back surface portion, and the fastening portion joined and attached in an area of joinder adjacent the edge of the diaper;
 h. whereby forces imposed on the fastening portion are transmitted to both the front and back surfaces of the diaper.

2. The improved tape fastener system of claim 1 wherein the front surface portion is a release liner, the front surface portion having its upper surface treated to give it moderate adhesive attachment to the third attachment means, the fastening portion being superposed on the front surface portion, and the third attachment means being between the front surface portion and the fastening portion, whereby the fastening portion is moderately held superposed on the front surface of the diaper.

3. The improved tape fastener system of claim 2 wherein the first common point of joinder of the front surface portion, the back surface portion, and the fastening portion lies substantially in a plane midway between the front and back surface of the diaper.

4. The improved tape fastener system of claim 3 wherein the back portion and the fastening portion are an integral strip of tape material.

5. The improved tape fastener system of claim 4 wherein the three attachment means are pressure sensitive adhesives.

6. The improved tape fastener system of claim 3 wherein the three attachment means are pressure sensitive adhesives.

7. The improved tape fastener system of claim 2 wherein the back portion and the fastening portion are an integral strip of tape material.

8. The improved tape fastener system of claim 7 wherein the three attachment means are pressure sensitive adhesives.

9. The improved tape fastener system of claim 2 wherein the three attachment means are pressure sensitive adhesives.

10. The improved tape fastener system of claim 1 wherein the first common point of joinder of the front surface portion, the back surface portion, and the fastening portion lies substantially in a plane midway between the front and back surface of the diaper.

11. The improved tape fastener system of claim 10 wherein the back portion and the fastening portion are an integral strip of tape material.

12. The improved tape fastener system of claim 11 wherein the three attachment means are pressure sensitive adhesives.

13. The improved tape fastener system of claim 10 wherein the three attachment means are pressure sensitive adhesives.

14. The improved tape fastener system of claim 1 wherein the back portion and the fastening portion are an integral strip of tape material.

15. The improved tape fastener system of claim 14 wherein the three attachment means are pressure sensitive adhesives.

16. The improved tape fastener system of claim 1 wherein the three attachment means are pressure sensitive adhesives.

17. The improved tape fastener system of claim 1 wherein the transverse dimension of the front surface portion is longer than the transverse dimension of the back surface portion.

18. The improved tape fastener system of claim 17 wherein the transverse dimension of the front surface portion is at least about twice as long as the transverse dimension of the back surface portion.

19. The improved tape fastener of claim 1 wherein the attachment between the front surface portion, the back surface portion, and the fastening portion in the area of joinder is in shear when a tensile force is applied to the fastening portion.

20. The improved tape fastener system of claim 19 wherein the segments of the front surface portion, the back surface portion, and the fastening portion, which are coextensive with the area of joinder, are parallel and extend outwardly from the first common point of joinder of the tape portions.

21. A disposable diaper comprising:

a. a thin, flexible, extensible backsheet;

b. an absorptive body having an absorptive core and a topsheet superposed on the core, the absorptive body being superposed on the backsheet so that the core is intermediate the topsheet and the backsheet;

c. a tape fastener system having

i. a front surface portion;

ii. first attachment means associated with the front surface portion and the front surface of the diaper for attaching the front surface portion to the front surface;

iii. a back surface portion;

iv. second attachment means associated with the back surface portion and the back surface of the diaper for attaching the back surface portion to the back surface;

v. a fastening portion;

vi. third attachment means associated with the fastening portion for attaching the fastening portion to another part of the diaper;

vii. the front surface portion, the back surface portion, and the fastening portion joined and attached in an area of joinder adjacent the edge of the diaper;

d. whereby forces imposed on the fastening portion are transmitted to both the front and back surfaces of the diaper.

22. The diaper of claim 21 wherein tape support means for attaching the backsheet to the absorptive body is between the backsheet and the absorptive body, the tape support means being between the back surface portion and the absorptive body, whereby forces transmitted to the back surface portion are in turn transmitted through the backsheet to the absorptive body.

23. The diaper of claim 22 wherein the topsheet has a longitudinal dimension longer than the longitudinal dimension of the absorptive core and the excess topsheet is folded around and under the longitudinal end of the core thereby forming a folded under portion, the folded under portion being intermediate the back surface portion of the tape fastener system and the absorptive core.

24. The diaper of claim 22 wherein the front surface portion is attached to the topsheet.

25. The diaper of claim 23 wherein the front surface portion is attached to the topsheet.

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Notice of Adverse Decision in Interference

In Interference No. 99,051, involving Patent No. 3,848,594, K. B. Buell, TAPE FASTENING SYSTEM FOR DISPOSABLE DIAPER, final judgment adverse to the patentee was rendered July 29, 1977, as to claims 1-16 and 19-21.

[Official Gazette February 14, 1978.]