

[54] **REMOVABLE PROTECTIVE LINER FOR NETHER GARMENTS**

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[73] Assignee: **Personal Products Company**

[*] Notice: The portion of the term of this patent subsequent to Apr. 20, 1988, has been disclaimed.

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[52] U.S. Cl.....**128/287, 128/288**

[51] Int. Cl.....**A61f 13/16**

[58] Field of Search.....128/284, 286, 287, 288, 289-291

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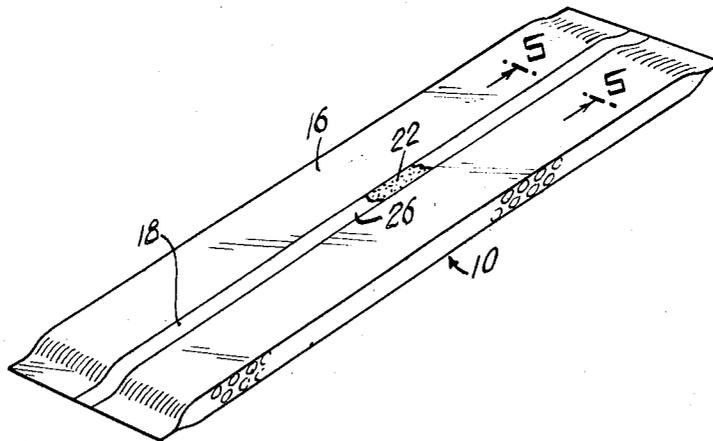
S. N. 848,812, McGuire, allowed Jan. 4, 1971 Commonly Assigned.

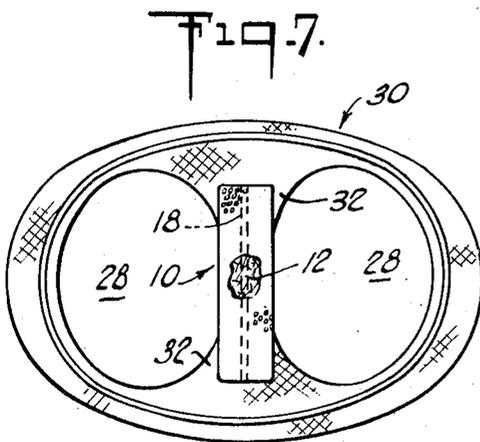
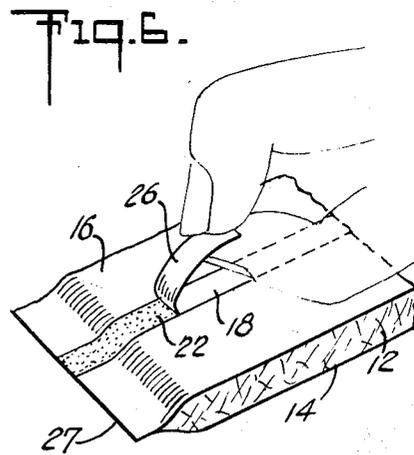
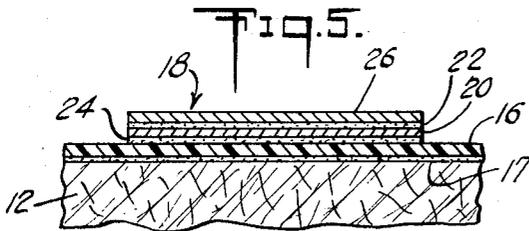
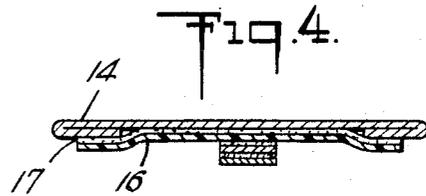
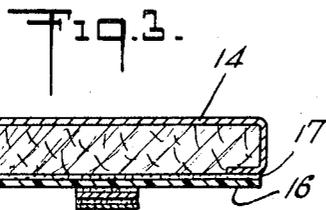
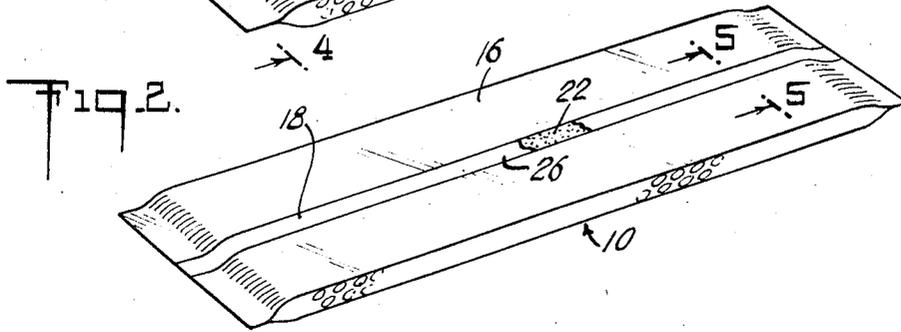
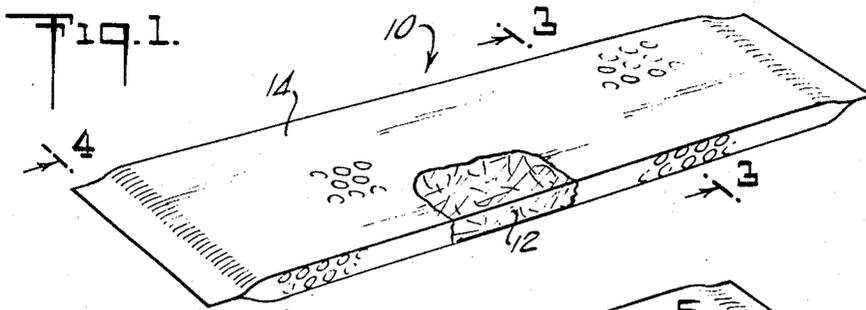
Primary Examiner—Charles F. Rosenbaum
Attorney—W. Frederick Mayer, Jr. and Robert L. Minier

[57] **ABSTRACT**

A protective liner which is temporarily, but securely, held to the interior crotch portion of nether garments by a narrow, double-faced, pressure sensitive adhesive tape provided on the under surface of the liner. The adhesive tape possesses differential adhesion levels such that the adhesive layer that secures the tape to the protective liner possesses a greater level of adhesion so as to permanently adhere the tape thereto, than does the adhesive layer of the tape that temporarily, but securely, adheres the tape and the liner to the crotch portion of the nether garment.

9 Claims, 7 Drawing Figures





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REMOVABLE PROTECTIVE LINER FOR NETHER GARMENTS

RELATED APPLICATIONS FOR PATENT

U.S. application Ser. No. 848,812 of Mary H. McGuire, filed Aug. 11, 1969, now U.S. Pat. No. 3,575,175, and assigned to the assignee of the present invention, discloses and claims a similar protective liner for nether garments in which the differential adhesion attachment means is provided in the form of discontinuous labels rather than in the form of a continuous tape or strip.

BACKGROUND OF THE INVENTION

This invention relates to absorbent pads and more particularly, is directed to an improved removable liner for protecting the crotch portion of nether garments against staining from vaginal or rectal discharges.

Many attempts have been made heretofore to provide an absorbent protective pad to be worn in the crotch portion of undergarments to protect the same from staining, for example, during the menstrual period when catamenial devices are employed to absorb the menstrual discharges. Sanitary napkins which are used by many during the menstrual period are conventionally provided with attachment tabs extending beyond the ends of an absorbent core which are secured to a separate suspensory belt that encircles the hips of the wearer. However, to eliminate the need for a separate suspensory belt it has been proposed to provide sanitary napkins without attachment tabs but which are maintained in place on the body of the wearer by having adhesive attachment means to removably secure the pad to the crotch portion of undergarments such as panties, girdles, and the like. These attempts, while ideal in principle, have not met with any reasonable success because of the failure to recognize the many different types of material from which such nether garments are made causing adhesive materials to be insecure fastening means in a great number of instances.

In general, it has mostly been proposed that catamenial napkins and protective liners for undergarments be adhesively secured into the crotch portion of the undergarment by using a so-called "double-faced," pressure-sensitive adhesive tape which is positioned on the underside of the absorbent pad, i.e., the side worn away from the body. The double-faced, pressure-sensitive adhesive tapes have consisted of an adhesive mass coated on both sides of a substrate filmlike material such as cellulose acetate, polyethylene, polyvinyl chloride, papers, and the like. One side of the double-faced, pressure-sensitive adhesive tape is pressed into attached engagement with the bottom surface of the absorbent pad while the other face of the double-faced, pressure-sensitive adhesive tape is covered with a release strip to protect the adhesive mass until such time as the pad is to be secured into the crotch portion of an undergarment. When it is desired to use the absorbent pad, the release strip is removed from the outer adhesive mass of the double-faced, pressure-sensitive adhesive tape and the pad is pressed into the crotch portion of the undergarment where it should remain until it is desired to discard the absorbent pad subsequent to use. It has been found, however, that such double-faced, pressure-sensitive adhesive tapes as used heretofore failed to perform satisfactorily their intended function. Oftentimes as the pad was removed from the crotch portion of the undergarment subsequent to use, the pressure-sensitive adhesive tape delaminated from the absorbent pad and remained secured to the crotch portion of the undergarment. Also, if the adhesion level of the double-faced, pressure-sensitive adhesive tape was increased sufficiently to prevent delamination from the absorbent pad, it was found that the crotch portion of the undergarment was torn upon attempting to remove the pad therefrom. Also, even more frequently, considerable amounts of the pressure-sensitive adhesive was left embedded in the fabric of the crotch portion of the undergarment leaving undesirable, rough, and unsightly residues which were not readily removed by washing.

All of the above problems were present in varying degrees in the double-faced, pressure-sensitive adhesive tapes used heretofore for fastening catamenial pads and protective liners to the many varying types of undergarments available on the market. I have now discovered an improved adhesive attachment for removable protective liners and sanitary napkins for the protection of nether garments which overcomes all of the aforementioned difficulties and shortcomings of the prior art adhesive attachments and which can be made economically on high-speed production equipment and which provides safe and secure attachment for such absorbent pads during use while being readily and easily removed subsequent to use.

SUMMARY OF THE INVENTION

In accordance with the present improvements, an absorbent protective liner comprising an absorbent core of highly absorbent material having a fluid pervious cover overlying the top surface of said core and a fluid impervious protective barrier overlying the bottom surface of said core is provided with adhesive attachment means positioned on the bottom surface of the absorbent liner which adhesive means comprises a double-faced, pressure-sensitive adhesive tape, the adhesive on one face of the tape having a higher adhesion level than the adhesive coating on the other face of said tape, the higher adhesion level ranging from about 30 to about 112 ounces per inch width and the lower adhesion level ranging from about 20 to about 49 ounces per inch width, the ratio between the higher and lower adhesion levels ranging from a minimum of 1.5:1 to a maximum of about 2.5:1. The side of the double-faced, pressure-sensitive adhesive having the higher adhesion level is secured to the bottom surface of the absorbent pad (the fluid impervious, protective barrier surface) with the side of the double-faced, pressure-sensitive adhesive tape having the lower adhesion level being covered with a removable release strip which upon removal of the release strip is ready for temporary but secure attachment to the crotch portion of a nether garment.

DESCRIPTION OF THE DRAWINGS

The improvements of the present invention will be even more readily understood by reference to the following detailed description when read in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of the protective liner of the present invention as viewed from the top;

FIG. 2 is a perspective view of the protective liner as viewed from the bottom;

FIG. 3 is a cross-sectional view taken approximately along lines 3—3 of FIG. 1;

FIG. 4 is a cross-sectional view taken approximately along lines 4—4 of FIG. 1;

FIG. 5 is an enlarged fragmentary cross-sectional view taken approximately along lines 5—5 of FIG. 2;

FIG. 6 is a fragmented, perspective view showing removal of the release paper from the double-faced, adhesive tape attachment means secured on the bottom surface of the protective liner; and

FIG. 7 is a perspective view seen from above showing the protective liner positioned and secured in the interior crotch portion of a panty undergarment.

Referring now, first to FIGS. 1 and 2, there is illustrated a protective, absorbent pad, generally designated by the numeral 10, which includes an absorbent core 12 covered over the top surface and the sides by a fluid pervious cover 14 and over the bottom surface by a fluid impervious barrier sheet 16 for the usual purpose of preventing strike-through of absorbed body exudates. The absorbent core 12 can be made from any of the many well-known materials having absorbent characteristics such as comminuted woodpulp, cotton linters, rayon fibers, cotton staple, bleached sulfite creped wadding, natural and synthetic polymeric foams, and the like and combinations thereof. The fluid pervious cover 14 can be a knitted, woven,

nonwoven or perforated paper material, and the like which extends only slightly beyond the ends of the core 12 where it is secured by an adhesive 17 (FIG. 4) to the fluid impervious barrier sheet 16 which can be a polyethylene or polypropylene film, cellophane, impregnated fluid repellent paper, and similar fluid impervious sheetlike materials. The barrier sheet 16 is also secured by the adhesive 17 to the bottom surface of the core 12 and to the longitudinal edges of the fluid pervious cover 14 where they are sandwiched between the bottom surface of the core 12 and the marginal edges of the inner surface of the barrier sheet 16. (FIGS. 3 and 4).

On the under surface of the absorbent pad 10, the side covered with the fluid impervious barrier sheet 16, is a longitudinally extending, narrow, adhesive attachment means 18. The adhesive attachment means 18 is narrow tape extending from end to end of the pad 12 and consists of a thin, filmlike substrate 20 having a first adhesive coating 22 on one surface thereof and a second adhesive coating 24 on the other surface thereof. The thin, filmlike substrate 20 can be of any of the materials known for such purposes such as Mylar, kraft paper, cellulose acetate, bleached sulfite tissue, etc. with cellulose acetate and bleached sulfite tissue being particularly suitable. The adhesive coating 24 is a pressure sensitive adhesive which secures the narrow tape substrate 20 to the surface of the fluid impervious barrier sheet 16 and the adhesive coating 22 is another pressure-sensitive adhesive coated on the outside surface of the substrate 20 and is protected by a release strip 26. The release strip can be of any suitable filmlike material that does not adhere too tenaciously to the adhesive coating 22 and particularly suitable is a semibleached, kraft paper one side of which has been silicone coated to provide for easy release of the paper strip 26 from the outer adhesive layer 22.

As shown particularly in FIG. 6, the end 27 of the pad 10 where the film 16 and the pervious cover 14 are secured together in overlying relationship is relatively flimsy compared to the core portion of the pad 10, such that the relatively stiffer release strip 26 can be grasped by the fingers and readily lifted and peeled back from the surface of the adhesive layer 22 when it is desired to secure the protective pad 10 in the crotch portion of a nether garment.

Once the release strips 26 have been removed, the pad 10 is placed lengthwise along substantially the whole length of the crotch portion defined between the leg openings 28 of a nether garment, such as a panty 30 (FIG. 7), with the adhesive surface 22 placed adjacent the interior of the crotch portion 32. The panty 30, once the pad 10 has been pressed into secured attachment with the crotch portion 32, is then protected from staining from body exudates when the panty is worn and subsequent to serving its intended function, the pad 10 can be removed by lifting it away from the crotch portion 32 of the panty and discarded.

To assure permanent attachment of the tape 18 to the fluid impervious barrier sheet 16 while at the same time assuring temporary, but secure, attachment of the tape 18 to the variety of fabrics from which nether garments are made, it is essential that the adhesive layer 24 and the adhesive layer 22 possess a differential level of adhesion. A differential level of adhesion is obtained when the opposite sides of the double-faced, pressure-sensitive adhesive tape 18 have a different adhesion level when the sides thereof are individually pressed into contact with the same surface material. The adhesion level is defined as that force required to strip or peel away a double-faced, pressure-sensitive adhesive tape which has been secured by one of its adhesive faces to the surface of a stainless steel plate and is quantified as ounces per inches of width of the tape. The differential level of adhesion required by the double-faced, pressure-sensitive adhesive tape 18 used in accordance with the present invention is such that the adhesive layer 24 has a level of adhesion, as above defined, ranging from about 30 to about 112 ounces/inch width and preferably ranging from about 60 to about 68 ounces/inch width and the adhesive layer 22 has a level of adhesion, as above defined, ranging from about 20 to about 49 ounces/inch width and

preferably ranging from about 32 to about 37 ounces/inch width. The ratio between the higher adhesion level of adhesive layer 24 and the lower adhesion level of adhesive layer 22 in any given double-faced, pressure-sensitive adhesive tape 18 must range from a minimum of about 1.5:1 to a maximum of about 2.5:1 and preferably from about 1.9:1 to about 2.1:1.

The differential adhesion levels required by the double-faced, pressure-sensitive adhesive tape 18 of the present invention can be obtained in several ways. The adhesive tape 18 can be made by providing the substrate film 20 with two chemically different pressure-sensitive adhesives applied to the opposite sides thereof. For example, adhesive layer 24, for permanent attachment to the barrier sheet 16, can be a high tack, natural crepe rubber, polyisoprene base adhesive while the adhesive layer 22 can be a low tack, acrylic copolymer base adhesive. Each of the adhesives can be formulated to meet the adhesion level requirements set forth above by any skilled chemist familiar in the field of pressure-sensitive adhesives.

By using the chemically different, pressure-sensitive adhesives on opposite sides of the substrate strip 20, the built-in integrity of the rubber-based adhesive layer 24 and the built-in integrity of the acrylic copolymer base adhesive layer 22 is maintained without migration of adhesion properties across the substrate layer 20, whether made of pervious (bleached sulfite tissue) or impervious (cellulose acetate) material, because of the inherent incompatibility of the different adhesives used. The rubber base adhesive, having the high degree of tack, assures permanent attachment of the tape 18 to the barrier sheet 16 while the softer, low tack acrylic adhesive assures excellent adhesion to fabrics regardless of the yarns from which the fabrics are made because the bond not only adheres well to the surface of yarns because of its physical nature, but actually flows in and around the courses and wales of the knitted fabric infinitely multiplying the surface area contact. Because of the integrity of the acrylic copolymer adhesive, however, the tape readily releases cleanly from the fabrics on the application of a positive and directional pull without leaving unsightly residues of adhesive.

Differential adhesion can also be imparted to the adhesive tape 18 when chemically similar pressure-sensitive adhesives are used for the adhesive layers 24 and 22. For example, adhesive layer 24 can be an acrylic copolymer base adhesive formulated so as to have a high adhesion level and the adhesive layer 22 can be a similar acrylic copolymer base adhesive but formulated to have a lower adhesion level, each of the adhesion levels obtained falling within the ranges set forth hereinabove. However, when chemically similar adhesives are used for the adhesive layers 24 and 22, the substrate strip 20 must be of an impervious material such as, cellulose acetate or Mylar, to prevent migration of adhesion properties from the adhesive layer 24 to the adhesive layer 22. If such migration were to occur, the adhesive level of adhesive layer 24 and the adhesion level of adhesive layer 22 would, after a short period of time, equalize, thus rendering the adhesive tape 18 unsuitable for its intended purpose.

Yet another way for obtaining differential adhesion levels for the tape 18 is to use either chemically different pressure-sensitive adhesives or chemically similar pressure-sensitive adhesives for the adhesive layers 24 and 22 but to reduce the surface area of the adhesive application on the side of the substrate strip 20 which is to be placed adjacent the fabric material of the crotch portion of the panty. This can be accomplished by forming the adhesive layer 22 with an intermittent pattern of adhesive such as, for example, longitudinally extending, transversely spaced adhesive lines; transversely extending, longitudinally spaced adhesive lines; adhesive lines coated in a rectangular or diamond pattern; intermittent spots of adhesives, etc. The intermittent patterns of adhesive can be applied to the substrate strip 20 by any of the well-known printing techniques.

From the above, it is seen that the present invention provides an improved adhesive attachment for removable protec-

tive liners and sanitary napkins for the protection of nether garments which assures safe and secure attachment for the absorbent pads during use while permitting the pads to be readily and easily removed subsequent to use.

I claim:

1. A protective absorbent liner for nether garments comprising

- a. a core of absorbent material;
- b. a fluid pervious cover overlying the top surface and the side edges of said core;
- c. a fluid impervious barrier sheet secured to and overlying the bottom surface of said core;

1. the lateral edges of said fluid pervious cover being spaced apart on the bottom surface of said core and sandwiched between said core and said barrier sheet in secured relationship therewith, and

2. the end margins of said cover and said barrier sheet being secured to one another in face to face relationship beyond the end edges of said core;

d. and adhesive attachment means positioned on the bottom of said liner for temporarily, but securely, adhering said liner to the interior of the crotch portion of a nether garment;

1. said attachment means comprising:

a. a double-faced, pressure-sensitive adhesive tape extending from end to end of said liner and having a differential level of adhesion by the adhesive layer of the first face of said tape having a level of adhesion ranging from about 30 to about 112 ounces per inch width and the adhesive layer of the second face of said tape having a level of adhesion ranging from about 20 to about 49 ounces per inch width,

b. the ratio between the levels of adhesion of the layer of adhesive of said first face and the layer of adhesive of said second face ranging from about 1.5:1 to about 2.5:1, and

c. the adhesive layer of said first face permanently adhering said tape to said barrier sheet and the adhesive layer of said second face temporarily, but

securely, adhering said tape and said liner to the interior crotch portion of said nether garment when said liner is being worn.

2. The protective absorbent liner of claim 1 wherein the adhesive layer of said second face is protected by a removable release strip when said liner is not in use.

3. The protective absorbent liner of claim 1 wherein the adhesive layer of said first face has a level of adhesion ranging from about 60 to about 68 ounces per inch width and the adhesive layer of said second face has a level of adhesion ranging from about 32 to about 37 ounces per inch width and the ratio between the adhesion levels of the layer of adhesive of said first face and the layer of adhesive of said second face ranges from about 1.9:1 to about 2.1:1.

4. The protective absorbent liner of claim 1 wherein the adhesive layer of said first face and the adhesive layer of said second face are chemically different, incompatible adhesive masses and are separated from one another by a pervious substrate film.

5. The protective absorbent liner of claim 1 wherein the adhesive layer of said first face and the adhesive layer of said second face are chemically different, incompatible adhesive masses and are separated from one another by an impervious substrate film.

6. The protective absorbent liner of claim 1 wherein the adhesive layer of said first face and the adhesive layer of said second face are chemically similar adhesive masses and are separated from one another by an impervious substrate film.

7. The protective absorbent liner of claim 1 wherein the adhesive layer of said first face is of greater surface area than the adhesive layer of said second face.

8. The protective absorbent liner of claim 1 wherein the adhesive layer of said first face is a natural crepe rubber, polyisoprene base adhesive and the adhesive layer of said second face is an acrylic polymer base adhesive.

9. The protective absorbent liner of claim 1 wherein the layer of adhesive of said first face and the layer of adhesive of said second face are both an acrylic polymer base adhesive.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,643,662 Dated February 22, 1972

Inventor(s) Mary H. McGuire

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet [72] cancel "Chandra Kapur, both of" .

Signed and sealed this 18th day of July 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents