

June 12, 1962

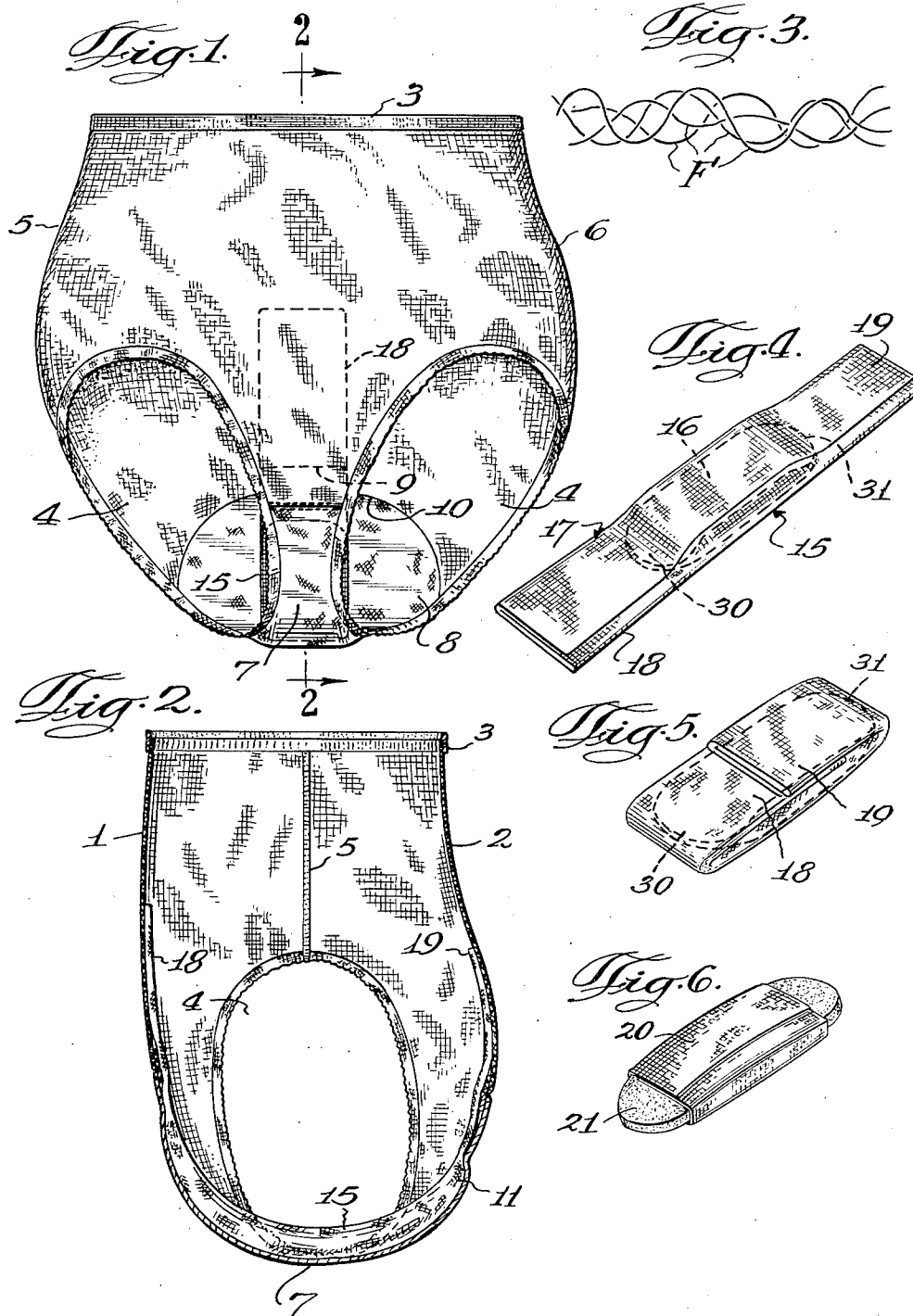
K. J. HARWOOD ET AL

3,038,474

SANITARY PRODUCT

Filed Feb. 24, 1959

2 Sheets-Sheet 1



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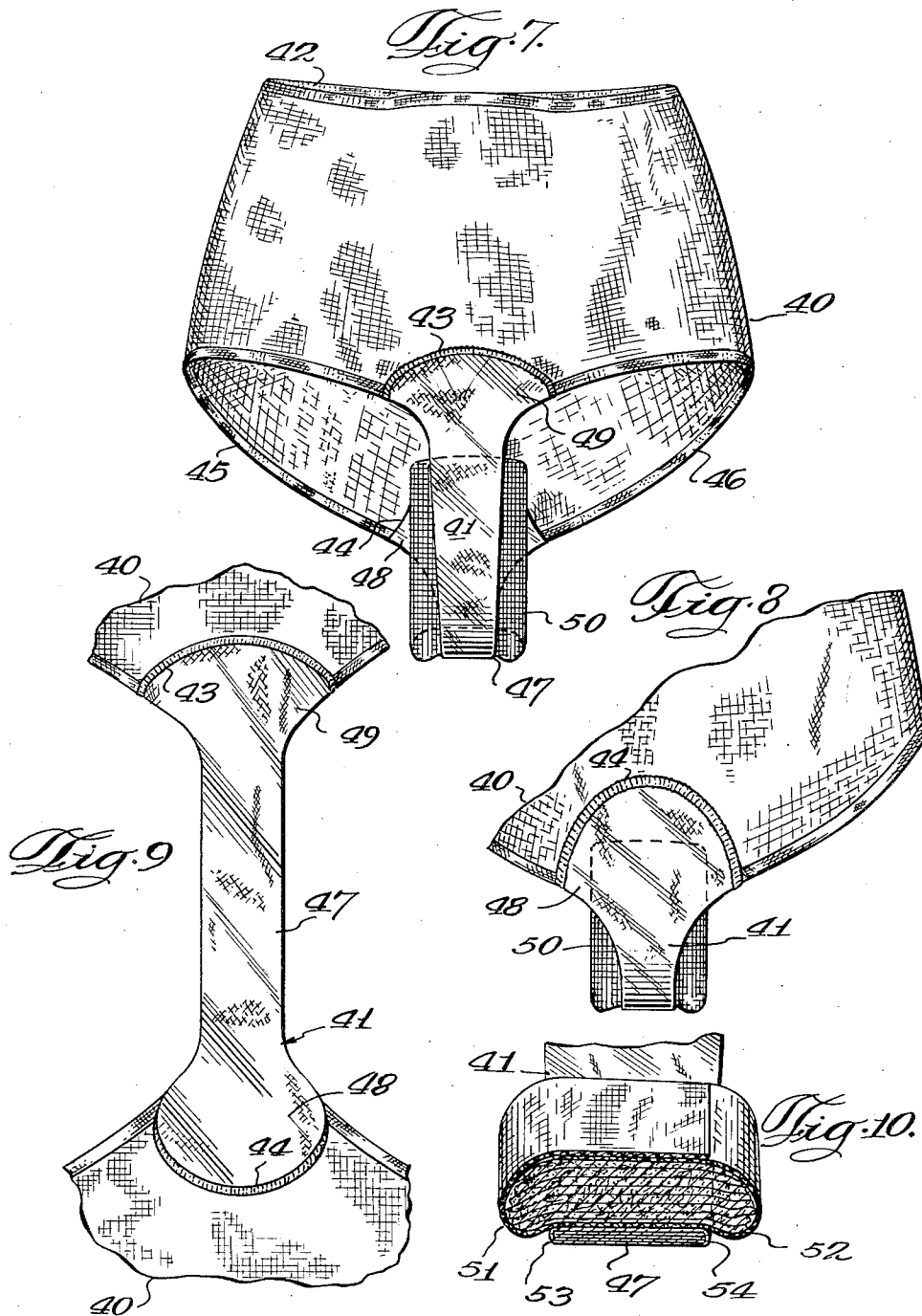
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2 Sheets-Sheet 2



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3,038,474

SANITARY PRODUCT

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Filed Feb. 24, 1959, Ser. No. 795,008
2 Claims. (Cl. 128-288)

This invention relates to an improvement in the art of supporting an absorbent dressing in the desired position against the body of a person, and it is more particularly concerned with the art of supporting catamenial dressings in proper position. This application is a continuation-in-part of applicants' copending application Serial No. 578,070 filed April 13, 1956, and now abandoned.

Catamenial bandages have most commonly been supported by attaching end extensions of the wrapper of the napkin, i.e., the tabs of the napkin, to an article of clothing or to a sanitary belt by means of pins or buckles. Panty type garments used for this purpose may be provided with tabs to which the tabs of the sanitary napkin are adapted to be pinned or otherwise attached.

A principal object of the present invention is to provide a sanitary napkin supporting or positioning arrangement which is operative to support a sanitary napkin in place without pin or other positive attachment of the napkin to any portion of a garment or other object. Other objects are to provide a supporting arrangement which can be depended upon to adequately support the napkin and hold it properly in place in a manner which avoids the application of pressure or pull on any localized part of the body, which provides much greater comfort to the wearer, and affords a sense of much greater security than prior conventional supports. The garter type supporter for sanitary napkins, which generally is made up of an elastic waist band and straps supporting the sanitary napkin at its ends, is complained of because the supporter has a tendency to move, stretch and relax with movements of the body causing movement and stresses in the supported sanitary napkin. The problems developed by such movement and stresses are that there is chafing action between the sanitary napkin and the body, and that the napkin is stretched, deformed and torn. Accordingly, there is a need for an efficient sanitary napkin support which will avoid the above-described difficulties.

An additional object of the invention is to provide a sanitary panty having a body portion and a crotch portion whereof the crotch portion is at least co-extensive with the length of a sanitary napkin carried by the sanitary panty, is subjected to such forces as to press the pad at its underside against the body, and is of such size at its mid-section that the pad tends to overlap the edges of the crotch portion thereby to prevent soiling of the crotch portion and chafing action between the edge of the crotch portion and the body of the wearer.

In addition to the indicated comfort advantages, the improvement hereinafter set forth affords a number of economic advantages to the manufacturer of sanitary napkins in that the provision of the usual long end tabs is made unnecessary and the wrapper or outer covering which is usually required for containing the absorbent pad portion of the napkin may be made of less costly material and of material which is more completely disposable than the gauze wrapper material which has heretofore been required.

Other objects and advantages of the invention will appear in connection with the following description of a selected form of support which is illustrated in the accompanying drawing.

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In the drawing:

FIGURE 1 is a front elevation of the improved sanitary napkin supporting arrangement approximately in the position which it assumes when on a person's body;

FIGURE 2 is a section on the line 2-2 of FIGURE 1;

FIGURE 3 is a schematic representation of a type of thread which is preferably employed in making the garment shown in FIGURES 1 and 2;

FIGURES 4 and 5 are perspective illustrations of a conventional sanitary napkin, which may be supported by the garment illustrated in FIGURES 1 and 2;

FIGURE 6 is a perspective illustration of another type of simplified sanitary napkin which may also be supported by said garment;

FIGURE 7 is a front elevation similar to FIGURE 1, of a second embodiment of the invention;

FIGURE 8 is a rear elevation, partially cut away, of the embodiment of FIGURE 7;

FIGURE 9 is a top view, partially cut away, on the napkin supporting device of FIGURE 7, particularly showing the crotch piece; and

FIGURE 10 is a cross-sectional view, partially cut away, through the crotch section of the embodiment of FIGURE 7.

The garment illustrated in FIGURES 1 and 2 comprises front and back portions 1 and 2 respectively which are preferably, but not necessarily, made of one piece of material suitably cut to permit the material to be fashioned into a garment having a waist band 3 and leg openings 4. Portions of the fabric member are brought together and suitably joined in side seams indicated at 5 and 6. The waist band and leg openings may have suitable elastic tape bindings therearound or any other suitable finishing treatment may be employed.

The garment is so formed as to have a narrow crotch portion 7 and the crotch portion is preferably reinforced by means of an inner ply 8 of fabric which extends from a point 9 high in the front portion of the crotch to a somewhat lower point 10 in the rear of the crotch.

The inner ply 8 of the two ply crotch structure is preferably knitted integrally into the crotch portion of the garment and its width is preferably made to conform to the entire width of the crotch portion between the opposite leg opening edges as illustrated in FIGURE 1.

As seen in both FIGURES 1 and 2, at that part of the crotch portion corresponding to the vaginal orifice of the female body, the crotch of the garment is somewhat narrower than the sanitary napkin associated therewith. The purpose of this is to prevent the outer edges of the crotch portion of the garment, in that area where menstrual fluid is exuded, from folding around the edge of the pad or napkin and coming in contact with the menstrual fluid, thereby becoming stained. Further, the forcing of the side edges of the napkin downwardly over the edges of the crotch portion, which tends to happen as described in detail below in connection with FIGURE 10, provides a support whereby there is less likelihood of lateral slippage of the napkin relative to the crotch portion. While the crotch portion in unstretched condition of the garment might be of width approximately equal to that of the napkin, depending upon the decrease in width resulting from stretching of the panty when worn to achieve the result described below, it is preferred for precautionary reasons that even in unstretched condition the crotch portion of the garment be narrower than the napkin.

The fabric employed for making the main body of the garment should be elastic or resilient (not necessarily embodying rubber) and easily stretchable so that the garment may be worn without excessive pressure on any

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part of the wearer's body. To that end, the garment is made from yarns which are highly stretchable, that is to say yarns which are stretchable from at least about 100% to about 400% of its original length, one form of such yarn being known as "Helanca" yarn. Many such yarns are now known. They usually embody a plurality of synthetic thermoplastic resin filaments F (FIG. 3) in regular or irregular sinuous form. Such sinuous form yarns are produced by known operations such as crimping, twisting, heat setting and untwisting, and others, and the yarns are identified as "supertwisted," "crimped," "creped," "curled," "wool-like," and perhaps by other terms which refer to a condition of form whereby the yarn is caused to have the indicated high degree of elasticity incident to its form rather than to the elasticity of the nylon or other material of which the yarn is made.

As aforesaid, we prefer to make the garment of fabric which is easily stretchable and such stretchability should be present in both longitudinal and transverse directions, i.e., vertically and horizontally of the garment. This will permit easy stretching of the garment in all directions. This stretchability may be controlled by appropriate selection of the yarn from which the fabric is knitted in accordance with its stretchability, the type of knitting or stitch employed in making the fabric, the cut of the garment forming fabric pieces, and perhaps other ways.

Yarns or filaments hereinafter described as "sinuous" comprise all of the yarn forms referred to by the said terms or others and which yarn forms are highly elastic because of their form rather than because of the elasticity of the material of which they are made.

The multiple filament yarns of this character, the separate filaments or strands are more or less locked to each other incident to intertwining of the irregularities or kinks along the lengths of the respective sinuous strands so that the plurality of strands form an integrated, highly stretchable, multi-filament yarn which has an irregular surface as distinguished from the smooth surfaces of the individual strands.

Yarns of the character indicated may be woven or knitted into fabric from which the garment may be made, and the garment constructed of such yarns will be a twoway stretch garment which is easily stretchable about 100% without impairing the elasticity of the garment or of the yarn therein, and without creating uncomfortable tightness or pressure on any part of the body of the wearer of the garment. The 100% stretch capacity exists in respect to stretch both vertically and crosswise of the garment.

It is a characteristic of yarn made of one or more sinuous filaments of the character described that, unlike rubber strands, the sinuous filament yarn exhibits a much greater capacity for stretching so that a considerable range of stretchability is provided in which the resistance to stretching does not increase in direct proportion to the increase in the elongation of the yarn by stretching. This characteristic becomes a characteristic of a garment made from such crimped filament yarn so that the garment is easily stretchable from a small initial size to a substantial range of larger sizes without uncomfortably increasing the pressure of the garment on the body.

It is desirable that the fabric be very light in weight and highly porous and absorbent so that the garment made from such fabric will also be light in weight, freely air permeable, and moisture absorbent. Good absorbency is readily attained in fabrics made of said sinuous-form yarns because of the great number of capillary interstices which are formed in each yarn between the filaments therein, said interstices and the interstices of the fabric (between yarn portions) serving to provide absorbent capacity and also air permeability.

The garment in its initial, unstretched condition may have a waistline circumference of about 14 inches so that the garment must be stretched to a considerable extent, usually more than 50% to fit an adult person having

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even a very small waistline measurement, i.e., about 22 inches. The length of the garment from the waistline thereof to the bottom of the crotch portion is also initially less than the corresponding measurement of the garment when being worn by a person of the size for which the garment is made. Accordingly, when the garment is worn, it is stretched both vertically and horizontally so that the thread portions which normally more or less parallel each other in spaced relation are pulled into an increased spaced relationship so that porosity of the garment is increased when the garment is worn.

In the garment as thus far described, wherein both the main part of the garment and the crotch portion are made of stretchable material, the sanitary napkin is firmly supported against the body as the result of the combined elasticity of the crotch portion and the main portion of the napkin. The crotch portion 7 not only holds the napkin in position, but in fact from its own construction, independent of the construction of the rest of the garment, elastically urges the napkin firmly into position.

The sanitary napkin 15 shown in FIGURE 4 is representative of a type of sanitary napkin which is available on the market. It comprises and absorbent pad body 16 having rounded and tapered end portions and a wrapper 17 of gauze or other suitable permeable material. The wrapper has extended end portions or tabs 18 and 19 which are usually attached by means of pins or buckles to supporting elements of a sanitary belt or other type of garment to support the napkin in operative position.

The described type of sanitary napkin may very satisfactorily be supported by the garment described by merely placing the napkin in the crotch portion of the garment as illustrated in FIGURE 2. The tabs 18 and 19 of the napkin may be folded over the top of the napkin as illustrated in FIGURE 5 or under the bottom of the napkin, or one of said tabs may be extended full length and the other folded over or under the pad portion of the napkin, and the napkin then positioned in the garment, or the napkin may be positioned in the garment with the napkin tabs extended as represented in FIGURES 1 and 2.

Since the attachment tabs 18 and 19 of the napkin are not required for the purpose for which they are usually provided, the tabs may be cut off adjacent the pad ends. The napkin construction may be simplified as represented in FIGURE 6 so as to provide a wrapper 20 about only a central or other portion of the absorbent pad body 21 to hold the components thereof together and, if the pad embodies very short fibers or other fine components, to prevent the escape or separation thereof from the pad body. In some instances, the pad body itself may be so made as to avoid even the requirement of an abbreviated wrapper such as the wrapper 20.

The sanitary napkin will usually be put in place after the garment is part way on. The highly stretchable character of the fabric in the garment makes it very easy to pull the crotch portion thereof away from the crotch area of the body so that the napkin may be adjusted to proper position in said area after which the crotch portion of the garment may be released and permitted to engage and conform to the pad in the position in which it is placed. The crotch portion of the garment will readily conform to the engaged surfaces of the body and the napkin.

As previously mentioned, and as seen from FIGURE 10 in connection with the second embodiment described hereinafter, the firm positioning of the napkin relative to the garment is enhanced because the crotch portion 7 in its mid-area is narrower than the napkin 15. This firm positioning is further enhanced by virtue of the fact that at the front 30 and rear 31 ends of the body portion of napkin 15 the crotch portion of the garment provides, as a result of its stretchability, effective pockets wherein the ends of the napkin are encompassed against the body of the wearer, thus anchoring those ends and conse-

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quently the napkin in desired position. The napkin or those portions thereof which project from the body of the wearer, will be conformed to, i.e., will be more or less pocketed in the garment as indicated at 11, such pocketing occurring especially at the ends of the napkin; however, this pocketing does not involve folding of margins of the narrow part of the crotch portion around the side edges of the central portion of the length of the absorbent pad.

This pocketing effect is, of course, automatic or self-forming as an incident to the soft stretchability of the garment fabric and the tendency of the garment to contract from its stretched condition on the body. This pocketing effect is but one of the factors which contribute to very secure holding of the pad in place by the garment with which it is associated.

When knitted into fabric, highly extensible, nylon yarn of the character represented in FIGURE 3 produces a fabric which has a hand like wool or cashmere. It presents a soft feel, is highly flexible and easily conformable to objects, and has a fine nap-like surface which is not slippery like the surface of fabric made from plain or untreated nylon, rayon or silk threads for example. The surface of the fabric appears to provide a high coefficient of friction which provides strong resistance to sliding movement of an article such as a sanitary napkin across the surface of the fabric; this attribute of the fabric also aids a garment made from the described sinuous filament yarn to effectively hold a sanitary napkin in predetermined position in the crotch portion of the garment without pin or other positive attachment of the napkin to the garment.

However, there appear to be factors not clearly understood which aid in securely holding an absorbent dressing in place in the perineal area, and to do so with exceptional comfort to the wearer of the garment.

For example, the aforementioned opening up of the garment fabric when the garment is put on, probably enables spaced yarn portions of the garment to become more or less embedded in the adjacent face of the sanitary napkin or perhaps recessed thereinto intermediate the threads of the wrapper if of gauze or similar material; such seating of the yarn portions in the surface of the wrapper may add materially to the capacity of the garment to hold the napkin against displacement across the face of the garment fabric. Another possibility is that there is a high degree of interlocking of fibers on the napkin surface with the crimps or other kinks in the yarns in the garment, there being a great number of such crimps or kinks which may be capable of such interlocking with fibers of the napkin.

In any event, it is clear that the combination of an absorbent dressing such as a catamenial bandage which has a fairly soft surface with a soft, highly stretchable garment made of synthetic, sinuous multiple-filament yarns provides an unusually high degree of comfort to the wearer of the combination, and exceptionally good control to the position of the sanitary napkin. The permeability of the garment material, especially in the crotch portion, avoids excessive warmth which is experienced when very close mesh fabric forms the crotch portion of the garment and when the crotch portion is lined with a moisture proof liner. By effectively holding the napkin in proper position, its absorbing capacity may be more completely and efficiently used and there is lesser need for providing clothing protection in the form of a moisture proof lining in the crotch portion of the garment. Easy stretchability of the garment as when made of highly stretchable yarns such as hereinabove described, also contributes to the wearer's comfort because the garment is capable of easily stretching and adjusting itself to different body portions without imposing localized stress on the garment; the body portion of the garment is capable of stretching for adjustment to various body positions without transmitting any excessive pull to the

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crotch portion so that a comfortable sanitary napkin supporting condition is not necessarily disturbed as an incident to changes of body position.

Referring next to FIGURES 7 to 10, the second preferred embodiment comprises a main garment body 40 similar to and comprising the same material as in the embodiment of FIGURE 1, but having a separate crotch portion 41 formed of a flexible but relatively inelastic material.

The top periphery of the body portion 40 is provided with an elastic band 42 for positioning the garment at the waist line of the wearer. The bottom periphery of the body portion 40, extension between the seams 43 and 44 by which crotch 41 is joined to the body portion, is provided with stretchable bands 45 and 46 for positioning the garment at lines running approximately from the pubic bone, under the hip joints and under the rear posterior muscles. Because of the normal curvaceous nature of the anatomy in the area between the top periphery and the bottom periphery of the body portion 40 and the elasticity of the fabric and the peripheral bands 42, 45 and 46, the body portion conforms to the wearer's body without the application of excessive pressure on any part thereof and because of these distributive pressures any "crawling" tendencies in the garment are avoided.

The crotch portion 41 is of a length so that when the garment is worn on the body, the crotch portion links the lower periphery of the front section of the body portion 40 to the lower periphery of the back section of the body portion and conforms generally to the curvature of the body in the crotch area. Relative to a sanitary napkin 50 carried by the sanitary panty garment, the crotch portion 41 is at least coextensive with the length thereof and preferably slightly longer, and the crotch portion is of a width that is generally less than that of the sanitary pad. Specifically, at the mid-section 47 the crotch portion 41 is narrower than the sanitary pad carried thereon and at one end section thereof, preferably the back section 48, the crotch portion 41 flares out to a width substantially wider than that of the sanitary napkin in association therewith and is terminated in an extensive arcuate or semi-elliptical edge at which the crotch portion is sewn or otherwise attached to the back section of the body portion 40 at the seam 44. At the front section 49 thereof, the crotch portion 41 may flare outwardly in order to provide an arcuate edge at which the crotch portion 41 is sewn or otherwise attached to the lower periphery of the front section of the body portion 40 at the seam 43. Because of the long arcuate attachment edgings, the mutual tensile forces between the crotch portion 41 and the elastic body portion 40 at the seams 43 and 44 are better distributed over a large area of the elastic body portion 40 so that no excessive pressures are experienced by any part thereof.

As will be better understood from the description given hereinafter, one end section, that is the back section 48 or the front section 49, but preferably the back section, is made of a width substantially wider than that of the sanitary napkin in association therewith so that when the garment is worn on the body, the sanitary napkin carried thereby will be wedged between the body and the broad end section to firmly position the sanitary napkin and to prevent both longitudinal and transverse movement thereof.

Considering now the manner of use of the sanitary panty garment in accordance with the invention, and assuming that the body portion 40 thereof is approximately positioned on the body as described above, a sanitary napkin 50 carried by the crotch portion 41 thereof is subjected to the longitudinal and transverse tensile forces developed by the body portion upon the end sections of the crotch portion and is held close to the wearer's body in the perineal area with one end of the napkin closely adjacent to the pubic bone and the other end of the

napkin slightly below the sacral area. Because the pad is held close to the body by pressure which is spread over a substantial area of the pad, the pad does not have a tendency to shift position and so it is more comfortable to the wearer, and additionally, because the pad is held close and firmly it functions more efficiently as a catamenial bandage than a pad supported at its ends as by a sanitary belt.

Because the general width of the crotch portion 41 is less than that of the sanitary napkin 50 and because the sanitary napkin is subjected to static and dynamic forces by the crotch portion and by the wearer's body, the sanitary napkin is arcuately deformed as shown in FIGURE 10 so that the longitudinal edges 51 and 52 thereof overlap the longitudinal edges 53 and 54 of the crotch portion 41. Accordingly, the soft padded edges 51 and 52 of the sanitary napkin 50 lie intermediate the wearer's body and the edges of the crotch portion 41, and the crotch portion does not come into contact with the wearer's body in the area of greatest fluid discharge. Thus, there is no chafing action, greatly contributing to the comfort of the wearer, and the exudate is absorbed entirely by the sanitary napkin 50 to maintain the crotch portion 41 unsoiled.

The crotch portion 41 is preferably of a washable, substantially non-extensible material. Additionally, the crotch portion of the garment may be made moisture resistant as by impregnating or coating the crotch portion material with a rubber or plastic compound, or by making the crotch portion of a multi-ply structure as shown in FIGURE 10 wherein an inner ply is a plastic or rubber sheet and the other plies are a knit material of cotton or some other easily washable fabric, the plies being fixed one to another as by sewn edgings at the edges 53 and 54.

With regard to the width of the crotch portion 41, sanitary napkins available on the market today have a width in the range of 2¼ to 3 inches so that the width of the crotch portion at the mid-section 47 thereof should be less than 2¼ inches. At the same time, the minimum width for the mid-section of the crotch portion should not be made so narrow as to cause the pad to be forced into the body cavity and create discomfort. In this regard, the minimum practical width is thought to be not less than about one inch. In practice, it has been found that a mid-section width of about two inches is most effective for accommodating the various widths of sanitary napkins and for effecting the purposes of the invention.

Referring to FIGURE 8, it will be seen that the widening of one end of crotch portion 41, such as rear end 48, provides a portion of the crotch in which an end of the napkin may be pocketed, substantially as described in connection with the first embodiment. Although this pocketing is of a different quality, primarily in being less snug and close fitting to the napkin than that provided by the first embodiment described herein, it provides a relatively effective anchor for an end of the napkin, and combined with the holding quality derived from the relative narrowness of central portion 47 of crotch 41 there is achieved a very effective means for retaining the napkin in position.

From the foregoing disclosure of the two preferred embodiments described, it is apparent that there has been provided by this invention an improved sanitary napkin supporting arrangement of novel construction. The invention includes a garment having a two-way elastic main

garment body of high stretchability, a crotch portion of relatively narrow width as compared with the sanitary napkin for firm retention of the napkin in a manner providing unusual hygiene, the crotch portion being at one end a construction for pocketing an end of the napkin against the body of the wearer. In the particular embodiments there may be utilized a stretchable crotch portion for uniform and elastic urging of the sanitary napkin against the body of the wearer, or an inelastic crotch portion upon which the elastic body portion of the garment may act as a suspension member for effective untensioned urging of the napkin against the body. While the napkin is firmly held in place without fastening devices, it is recognized that certain users may with the addition of snaps gain a feeling of security. Any of many known devices may be incorporated to permit napkin attachment to the panty. Snap fasteners may be secured to the enlarged end portions of the narrow crotch piece, for example, and the napkin tabs may be provided with apertures for easy attachment of the tabs to the fasteners.

Having now described two specific embodiments of the invention, it is to be understood that no limitation upon the scope of the invention is intended except as expressly set forth in the appended claims.

This application is a continuation-in-part application of our prior application, "Absorbent Dressing Support," Ser. No. 578,070, filed April 13, 1956.

What is claimed is:

1. The combination with an elongate sanitary napkin of a width not more than one-half its length, of a panty type garment for the support thereof in the perineal area of the wearer's body, said garment having a body portion and a depending strap-like crotch portion of a width throughout a major portion of the length thereof less than the width of the napkin to be supported thereby, said body portion being of two-way stretch elastic fabric including elastic, porous, lightweight, sinuous synthetic yarn stretchable to at least twice its untensioned length, said fabric being easily stretched in all directions, and adapted during use to draw the crotch portion against a sanitary napkin positioned along the perineal area of a user's body.

2. The combination with an elongate sanitary napkin of a width not more than one-half its length, of a panty type garment for the support thereof in the perineal area of the wearer's body, said garment having a body portion and a depending strap-like crotch portion narrower than the napkin width throughout an area substantially co-extensive with the length of the napkin to be supported thereby, said body portion being of two-way stretch elastic fabric including elastic, porous, lightweight, sinuous synthetic yarn stretchable to at least twice its untensioned length, said fabric being easily stretched in all directions, and adapted during use to draw the crotch portion against a sanitary napkin positioned along the perineal area of a user's body.

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**UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION**

Patent No. 3,038,474

June 12, 1962

Kenneth J. Harwood et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, lines 55 and 56, strike out "thereby to prevent soiling of the crotch portion", column 4, line 24, for "and" read -- an --; line 54, strike out "put", second occurrence; column 6, line 13, after "40," insert -- in --; column 8, line 5, for "pockting" read -- pocketing --.

Signed and sealed this 17th day of September 1963.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents