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Continuation-in-part of application Ser. No. 10,770, Feb. 12, 1970, and a continuation-in-part of 21,409, Mar. 20, 1970, and a continuation-in-part of 36,552, May 12, 1970. This application Nov. 3, 1970, Ser. No. 86,582

[54] **FULLY CONTOURED, HIGHLY STYLIZED PANTY-TYPE GARMENT AND PROCESS FOR MAKING SAME**
4 Claims, 7 Drawing Figs.

[52] U.S. Cl. **2/224 R, 66/177**
[51] Int. Cl. **A41b 9/04**
[50] Field of Search. **2/224, 224 A, 225, 226, 238, 181, 243; 66/177, 176, 192, 195**

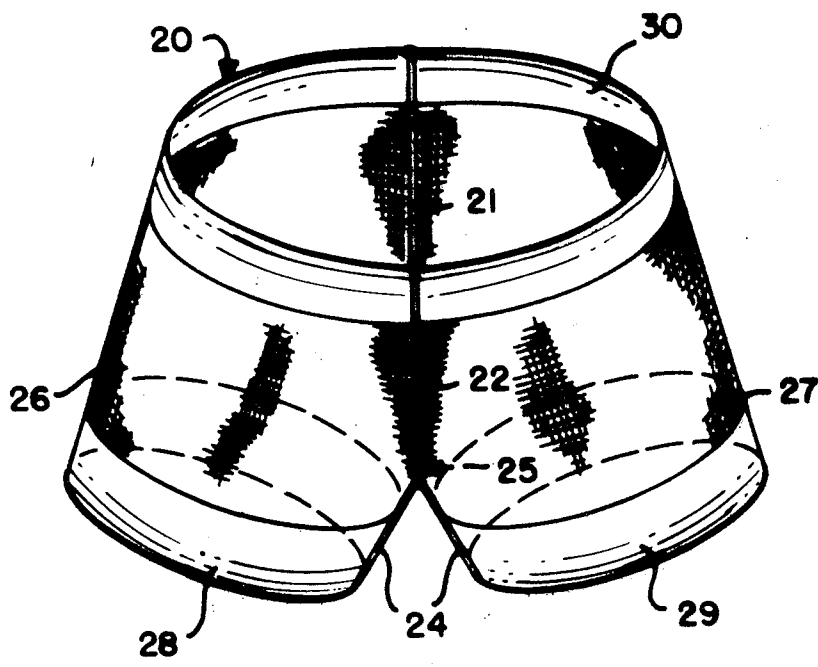
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ABSTRACT: A fully contoured, highly stylized panty-type garment (for example, panty or panty girdle), which is constructed in a novel manner, utilizing two or three separate pieces of fabric is disclosed. Each of the fabric pieces are of warp knitted construction, and are specially constructed to have integrally knitted selvages of one-way stretch, elastic construction. In the finished garment, the elastic selvages of the fabric pieces are joined to form either the waistband or the legband elastics. A highly stylized, fully contoured shape is imparted to the finished garment by utilizing, in the construction thereof, superimposed pairs of identical, generally trapezoidal sections of the warp knitted material in which the bases of the trapezoidal sections comprise legband selvages and are substantially greater than the lengths of the upper edges of the trapezoidal sections which comprise the waistband selvages. The opposite sides of the trapezoidal sections are defined by "178 Y" cuts in which the stem of the Y is perpendicular to the legband selvedge and the arms of the Y are generally parabolic. The garment is completed by sewing together the superimposed parabolic edges of the trapezoidal sections, thereby forming generally vertical, central front and rear garment seams, and then sewing together the opposite straight edges of each trapezoidal section to form a generally horizontal crotch seam. Where large body sizes are to be accommodated, a separate crotch piece is incorporated in the garment construction, extending in the front-to-back direction between the straight side edges of the trapezoidal sections. The crotch piece, like the main fabric section, is of warp knitted construction and has integral elastic selvages identical in construction to that of the legband selvages of the main or body fabric section.



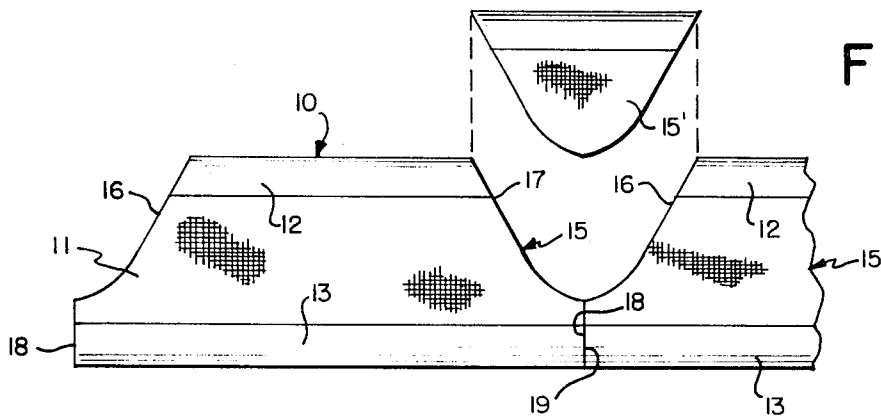


FIG. 1

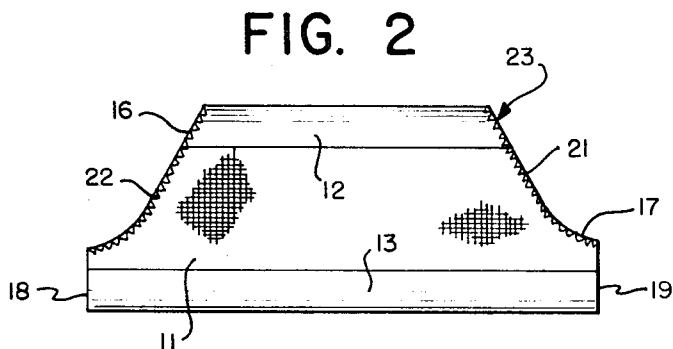


FIG. 2

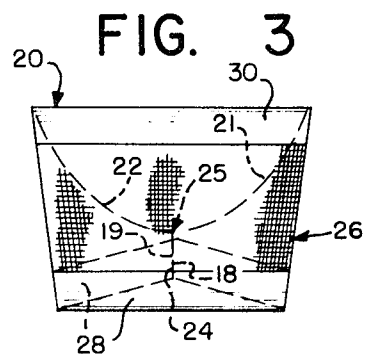


FIG. 3

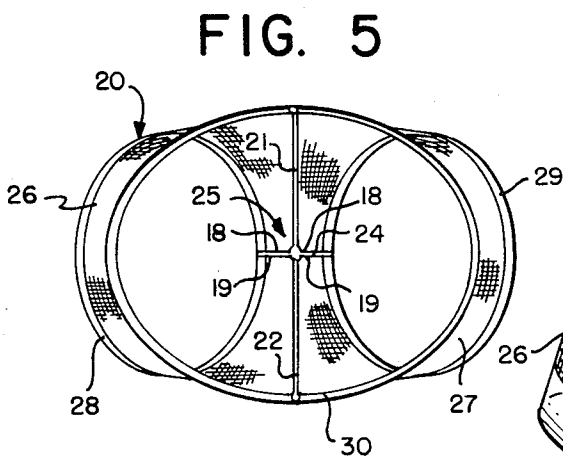


FIG. 4

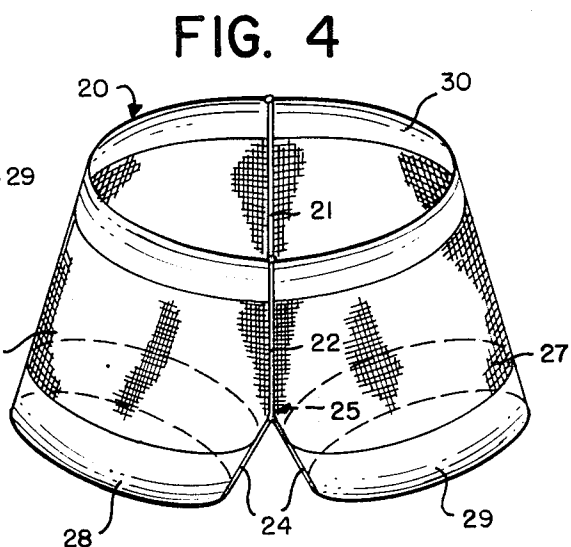


FIG. 5

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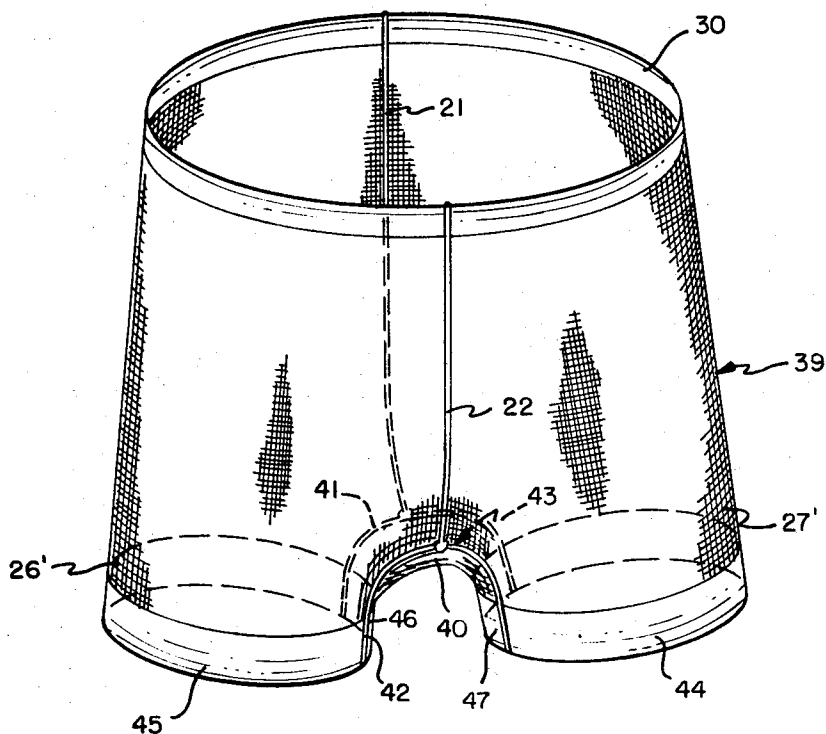


FIG. 6

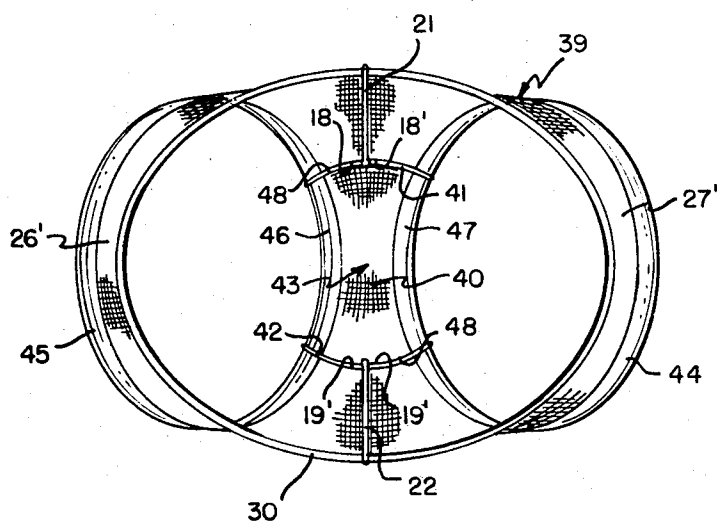


FIG. 7

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FULLY CONTOURED, HIGHLY STYLIZED PANTY-TYPE GARMENT AND PROCESS FOR MAKING SAME

CROSS REFERENCES TO RELATED APPLICATIONS

This application is closely related to and constitutes a continuation-in-part of the copending applications of Louis Sarmiento, Ser. No. 10,770, filed Feb. 12, 1970 and entitled "Panty-Type Garment and Process of Making Such Garment"; Ser. No. 21,409, filed Mar. 20, 1970, entitled "Warp Knit Fabric Adapted Especially for the Manufacture of One-Piece or Two-Piece Panty-Type Garments"; and Ser. No. 36,552, filed May 12, 1970, entitled "One-Piece or Two-Piece Panty-Type Garment, and Process and Fabric Suitable For Making Such Garment." The first-mentioned application relates to a panty-type garment, particularly of one-piece construction, utilizing a section of warp knit fabric, especially constructed to include integral elastic selvages having one-way stretch characteristics. A section of the special fabric is secured to form a tube, in which one elastic selvedge forms a waistband and the other elastic selvedge is sewed together by an inverted U-seam in the crotch area to form a pair of leg-encircling elastic legbands. The second-mentioned copending application relates principally to the construction of a unique warp knit fabric having integral one-way stretch elastic selvages and a two-way stretch body area disposed therebetween. The third-mentioned application relates to "partially contoured" one- and two-piece panty-type garment constructions made from the aforementioned special fabrics. It is suggested that reference be made to the disclosures of the related copending applications, which are incorporated by reference herein, for a fuller appreciation of the present invention.

History of the Invention

In the copending Sarmiento application Ser. No. 10,770, it is disclosed that a novel and improved panty-type garment can be constructed utilizing a single, substantially rectangular section of fabric from a continuous or substantially continuous knit web of combination fabric. The garment thus disclosed has extraordinary advantages in respect of the savings realizable in the manufacture thereof from a single piece of fabric rather than, more conventionally, from a number of pieces of fabric and sections of elastic. The copending Sarmiento application Ser. No. 36,552 discloses partially contoured one- and two-piece panty-type garments which also provide substantial manufacturing economies. The present invention is directed to the making of further improvements on the above-disclosed garment constructions, particularly in the direction of imparting more styling and more complete contours of the garment. The more complete contours are particularly desirable for adult garments, especially foundation garments or girdles.

One technique for achieving partially contoured garments involves cutting single fabric sections from the basic special web in a trapezoidal configuration in which the elastic selvedge eventually intended to form the legband elastics is of substantially greater length than the elastic selvedge eventually to form the waistband elastic. When the trapezoidal section is folded and the respective end edges of the single section are sewed together, in accordance with the teachings of the Sarmiento application Ser. No. 36,552, the garment is oriented so that the area of the seam constitutes the rear or seat portion of the garment. This results in a one-piece garment having greater fullness in the seat area and imparts a "partial contour" to the garment. As disclosed in copending application Ser. No. 36,552, the secured-together edges of the single fabric section may be cut with a deep arcuate shape to provide more substantial fullness to the seat portion of the garment.

For the larger sizes of adult garments and whenever desirable to introduce increased front-to-back fullness to the crotch area of the garment, a second piece of fabric is added to the garment. The additional piece, referred to therein as a crotch piece, is constructed in accordance with the before-mentioned

Sarmiento application Ser. No. 21,409, to have integral elastic selvages having effective one-way stretch characteristics, and an intermediate body fabric integrally associated with the selvages and having two-way stretch characteristics. In the construction of the two-piece garment, in accordance with the invention of application Ser. No. 36,552, the main fabric section is formed into a tube, in the usual manner, but the front and back sections thereof are not secured directly together in the crotch area as in the case of a one-piece garment. Rather, the special crotch piece is inserted, extending in the front-to-back direction, between and connected to the front and back sections. The elastic selvages of the crotch piece connect the legband selvages of the main fabric section and form therewith a pair of continuous legband elastics in the finished garment.

In each of the above-described forms of panty-type garments, major economies are realized in the manufacture of the garments, as compared to more conventional garment construction techniques. However, for many foundation garments, girdles, and the like, it is especially important and, indeed, it is often critical that the garment be "fully" contoured or shaped to conform more precisely to actual body shapes and sizes.

SUMMARY OF THE INVENTION

The present invention is directed to the provision of an economical, "fully contoured," highly-stylized panty-type garment which is especially suited for foundation garments, girdles, and the like. The inventive concepts herein represent unique extensions and modifications of the inventions disclosed in the aforementioned copending applications, the disclosures of which have been incorporated herein by reference.

Specifically, a fully contoured, panty-type garment having an elasticized waistband and elasticized legbands, may be manufactured in just a few steps from a starting web material of special fabric having two-way stretch body portions and integral one-way stretch selvages, manufactured in accordance with the principles of application Ser. No. 21,409. A series of unique, generally trapezoidal fabric sections are derived from the starting web by periodically cutting the web with Y cuts. Each of the trapezoidal sections has a lower edge of legband selvedge, a shorter upper edge of waistband selvedge, and symmetrical side edges of opposite $\frac{1}{2}$ Y configuration, i.e., an elongated parabolic or arcuate upper side edge portion merging with a comparatively short straight edge portion perpendicular with the legband selvedge.

In accordance with the invention, the specific curvature of the parabolic portion side edges will be determinative of the contour of the front and rear garment wall portions, abdomen and buttocks engaging portions, respectively; the differential in the lengths of the upper and lower selvedge edges will determine the angles of the planes of the leg openings of the garment with respect to a horizontal plane; the height of the side straight edge portions will determine the width of the crotch of the finished garment and the length of the legs of the garment.

For a better understanding of the invention and its attendant advantages, reference should be made to the following detailed description thereof and to the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a section of special fabric web cut in a unique manner to provide starting sections for the construction of a fully contoured two-piece or three-piece garment;

FIG. 2 is a plan view of a first construction stage of a two-piece or three-piece garment according to the invention in which superimposed pairs of fabric sections of the type shown in FIG. 1 are joined at their parabolic edge portions;

FIG. 3 is a plan view of a flat-folded, two-piece garment constructed in accordance with the invention;

FIG. 4 is a perspective view of a two-piece garment embodying the inventive principles;

FIG. 5 is a top plan view of the garment of FIG. 4;

FIG. 6 is a perspective view of a three-piece garment constructed in accordance with the invention; and

FIG. 7 is a top plan view of the garment of FIG. 6.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, and initially to FIGS. 1-5 thereof, a web 10 of warp knitted fabric, as constructed in accordance with the Sarmiento application Ser. No. 21,409, is the desired starting material. The fabric web 10 comprises a body portion 11, constructed to have two-way effective elasticity, and elastic selvedge portions 12, 13 constructed to have one-way elasticity. The effective elasticity of the selvages 12, 13 is in the wrap (lengthwise) direction, while the effective elasticity of the body portion 11 is both lengthwise and widthwise. Thus, the fabric 10 is especially suited for foundation garments and girdles. As explained in the aforementioned copending application, the fabric 10 is knitted in substantially continuous lengths and is so constructed that, in its relaxed condition, the courses, or transverse rows of stitches, have a generally straight-across disposition.

In accordance with the invention, generally trapezoidal garment sections 15 are cut from the web 10 of knitted fabric in a manner whereby the lengths of the upper trapezoid edges, the elastic selvages 12, are determinative of one-half the desired waist size of the finished garment, and the longer base edges of the trapezoidal sections, the elastic selvages 13, are determinative of the leg band size of each garment leg. In the illustration of FIG. 2, the legband elastic is advantageously approximately 40 percent longer than the waistband elastic, although it should be understood that there is considerable latitude in this relationship within the teachings of the invention.

As shown in FIG. 1, consecutive trapezoidal fabric sections 15 are separated from one another and the web 10 by Y-shaped cuts. Intermediate waste sections 15' are discarded. More specifically, the upper side edges of the trapezoidal fabric section 15 are formed by deep parabolic cut edges 16, 17. These cuts extend downward and outward until they connect with upper ends of vertical cut edges 18, 19, which extend perpendicularly through the legband elastic selvages 13. As will be understood, the straight edges 18, 19 are formed by the "stem" of the Y cuts, while the edges 16, 17 are formed by the divergent "arms" of the Y cuts. Desirably, the lower portions of the parabolic cuts 14, 15 define a relatively small angle, with the horizontal at the points where the cut edges 16, 18 and 17, 19 are joined. As shown in FIG. 1, the cut trapezoidal fabric section is symmetrical about a vertical axis, however, if slightly different contours are desired for the front and rear walls of the garment, the curvatures of edges 16, 17 may be varied.

In the formation of a two-piece garment 20 (FIG. 4) from pairs of generally trapezoidal fabric sections 15, the sections are superimposed back-to-back (fabric "wrong" side out) so that the cut edges 16-19 of each section overlie each other in registry, as shown in FIG. 2. The parabolic cut edges are then sewed together along seams 21, 22, which will create a garment preform 23 having full-depth, central, front and rear seams. The vertical cut edges 18, 19 are, however, left temporarily unsecured.

In accordance with the invention, the tubular garment preform 23, having a continuous waistband 30, created by the connection of selvages 12 by the seams 21, 22, is finished into a completed two-piece garment by folding the bottoms of each of the garment sections 15 to bring together the two pairs of straight edges 18, 19. These are sewed together along a common seam 24, which is perpendicular to seams 21, 22, as reflected in FIG. 4. This joins the front and back portions of the garment preform 23 in the crotch area and completes the crotch construction 25 of the garment, while also connecting the opposite ends of each of the legband selvages 13 to form separate tubular garment legs 26, 27 and continuous leg-encircling elastics 28, 29.

In normal practice, the garment is sewed up while in a wrong side out orientation. Accordingly, after the sewing operations have been completed by forming the seams 21, 22, 24, the garment is turned right side out. Advantageously, the thread and/or type of stitching used to establish the seams 21, 22, 24 are selected to make those seams themselves elastic or stretchable along their lengths. The finished garment, shown in flat-folded, elevational view in FIG. 3, has the full, stylized contours heretofore available in conventional garments assembled in large numbers of operations, from large numbers of separate fabric pieces, and no fewer than these separate elastics for the waistband and legbands. Nevertheless, the garment 20 of the present invention is constructed from only two pieces of fabric web and requires only three easily constructed seams to complete its manufacture.

The embodiment of the invention shown in FIGS. 6 and 7 incorporates the inventive substance of the garment of FIGS. 1-5. Moreover, it includes an auxiliary crotch piece 40 to impart larger crotch areas to garments such as those for larger body sizes, and it is made from trapezoidal sections of slightly different geometry to provide a "longer line" garment than the shortie-type garment of FIGS. 1-5. The garment 39 is formed from sections 15 derived from an extra wide web, thus the overall depth of the garment is increased and the edges 18', 19' are elongated in comparison to edges 18, 19, thereby providing longer legs 26', 27'. In general, the garment 39 of FIGS. 6 and 7 is constructed in the identical manner so that of the garment 20 of FIGS. 1-5, in that pairs of trapezoidal sections are superimposed and joined together along vertical seams 21, 22 to form a garment preform 23. However, in this alternate three-piece construction, straight edges 18', 19' are longer than the edges 18, 19 of garment 20, and they are not secured directly together. Rather, in accordance with this embodiment of the invention, the special crotch piece 40 is disposed therebetween and is secured thereto along seams 41, 42 to form an enlarged crotch area 43 and enlarged, continuous, two-piece leg bands 44, 45. Advantageously, the seams 41, 42 are elastic in their length as in the case of seams 21, 22.

The crotch piece 40 is constructed by manufacturing techniques closely corresponding to those utilized in the construction of the main body fabric sections 15. That is, the fabric is of warp knit construction, preferably made on a Raschel machine. It is constructed to have selvedge portions 46, 47 having one-way (lengthwise) effective elasticity, and an integral body portion therebetween, having two-way effective elasticity. The fabric is constructed in webs of substantial length, and the webs are then cut transversely to form the individual crotch pieces 40.

In the construction of the trapezoidal garment sections 15, it is often desirable to impart different characteristics of elasticity to the respective selvedge portions 12, 13, inasmuch as, in the finished garment, the selvages 12 constitute a waistband elastic and selvages 13 constitute legband elastics, and different characteristics usually are desired for these different functions. Of course, in the case of the wrap knit web material of which the crotch pieces 40 are formed, however, the elastic selvedge portions 46, 47 are of the same construction and have the same elastic characteristics. Moreover, the construction and elastic characteristics of the crotch piece selvages 46, 47 are designed to be the same or substantially the same as the construction and elastic characteristics of the legband selvages 12, so that their interconnections, as shown in FIGS. 6 and 7, form continuous, uniform leg bands in three-piece garments 39.

In the construction of the garment, shown in FIGS. 6 and 7, the crotch piece 40 is cut to have end edges 48 which correspond in length to the combined lengths of the edges 18', 19' of the trapezoidal sections to which they are secured in the finished garment. Typically, the end edges 48 of the crotch piece are of arched or similar arcuate configuration, whereby the central fabric portions of the crotch piece are of greater length than the selvedge portions.

As will be appreciated, the three-piece garment of FIGS. 6 and 7 retains in great measure the extraordinary economic advantages of the two-piece garment construction of FIGS. 1-5, while providing for adapting the garment for the larger adult sizes. The crotch piece 40 may be incorporated into the two-piece garment by two simple stitching operations, and includes integral elastic selvages corresponding to the legband elastics of the main fabric section. Thus, in both the new and improved fully contoured two-piece and three-piece garments, the usually time-consuming and difficult operations of sewing the waistband and legband elastics to the body fabric are totally avoided. Moreover, it will be appreciated that the fully contoured two-piece garment may be constructed with only three seams, while the fully contoured three-piece garment may be constructed with four seams.

It will be understood, of course, that the specific forms of the invention herein illustrated and described are intended to be representative only, as certain changes may be made therein without departing from the clear teachings of the disclosure. Accordingly, reference should be made to the following appended claims in determining the full scope of the invention.

What is claimed is:

1. A fully contoured, stylized, bifurcated panty-type foundation garment having a waist opening, a crotch area, and a pair of leg openings, comprising
 - a. a pair of identical generally trapezoidal garment sections cut from a web of warp knit combination fabric having body portions and integrally knitted one-way stretch elastic selvages;
 - b. the lower edge of each of said trapezoidal garment sections being formed by one of said elastic selvages and being longer than the upper edge, which is formed by the other elastic selvedge;
 - c. said lower edge selvages and upper edge selvages extending in initially straight, spaced parallel relation throughout their entire lengths;
 - d. each of said trapezoidal sections having first and second opposite end edges extending generally arcuately downward and outward from the upper edges of the upper elastic selvages to predetermined points equally spaced above the lower edges of the lower elastic selvages and extending generally straightly downward from said points to said lower edges;
 - e. the first and second end edges of said trapezoidal sections being in registry and being connected by first and second lines of stitching extending in a continuous line from the upper edges of the upper selvages to said predetermined points;
 - f. said first and second lines of stitching forming vertical, central front and rear seams in said garment;
 - g. the remaining end edge portions of each of said garment sections, which portions extend between the lower edge and said predetermined points, being connected to each other by a third line of stitching extending perpendicularly with and intersecting the lower end of said first and second lines of stitching;
 - f. said third line of stitching thereby completing a pair of

- legs of the garment from the lowermost areas of the trapezoidal sections and forming a crotch area in the garment;
- i. said garment thereby having integrally formed continuous one-way stretch elastic legbands at the bottom of each of said legs and an integral continuous one-way stretch waistband at its upper edge formed by said sewed together integral elastic selvages.
 2. The garment of claim 1, in which
 - a. said body portions of said warp knit fabric have two-way stretch characteristics.
 3. A fully contoured, stylized, bifurcated panty-type foundation garment having a waist opening a crotch area, and a pair of leg openings, comprising
 - a. a pair of identical generally trapezoidal garment sections cut from a web of warp knit combination fabric having body portions and integrally knitted one-way stretch elastic selvages;
 - b. the lower edge of each of said trapezoidal garment sections being formed by one of said elastic selvages and being longer than the upper edge, which is formed by the other elastic selvedge;
 - c. said lower edge selvages and upper edge selvages extending in initially straight, spaced parallel relation throughout their entire lengths;
 - d. each of said trapezoidal sections having first and second opposite end edges extending generally arcuately downward and outward from the upper edges of the upper elastic selvages to predetermined points equally spaced above the lower edges of the lower elastic selvages and extending generally straightly downward from said points to said lower edges;
 - e. the first and second edges of said trapezoidal sections being in registry and being connected by first and second lines of stitching extending in a continuous line from the upper edge of the upper selvages to said predetermined points;
 - f. said first and second lines of stitching forming vertical, central front and rear seams in said garment;
 - g. the remaining end edge portions of each of said garment sections, which portions extend between the lower edge and said predetermined points, being connected to a separate crotch piece by third and fourth lines of stitching extending across and intersecting the lower ends of said first and second lines of stitching;
 - h. said crotch piece having spaced parallel elastic edge portions and crotch side edge portions;
 - i. said third and fourth lines of stitching connecting the side edges of said garment sections and said crotch edge portions;
 - j. said elastic edge portions of said crotch piece being of a construction corresponding to that of said lower selvages whereby said elastic edge portions extend between and connect the ends of the lower selvages into continuous, uniform legbands.
 4. The garment of claim 3, in which
 - a. the crotch side edge portions are of generally arched shape.

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