May 15 , 1956 V. C. VAN HORNE 2,745,103

GIRDLE

Filed Dec. 21, 1954 2 Sheets-Sheet 1

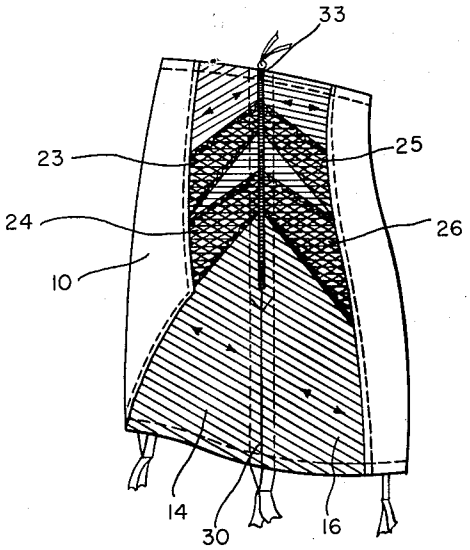


Fig. 1

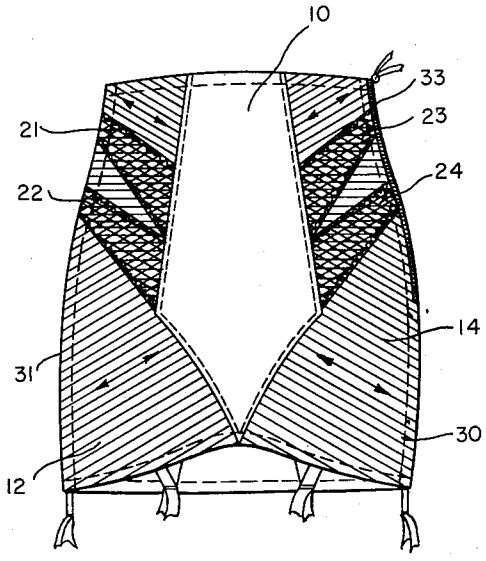


Fig. 2

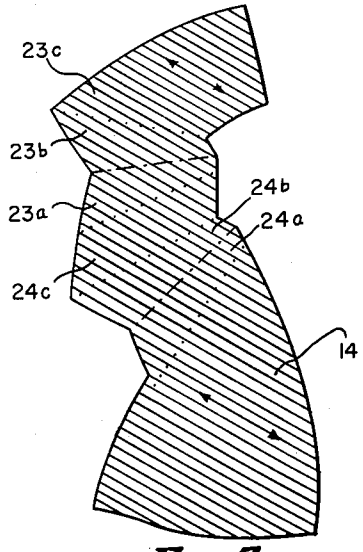


Fig. 3

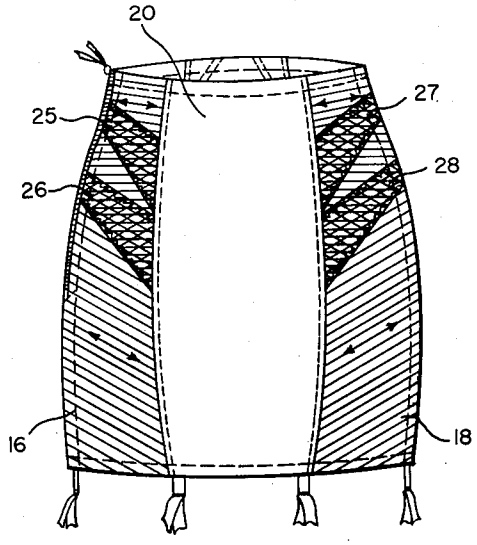


Fig. 4

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GIRDLE

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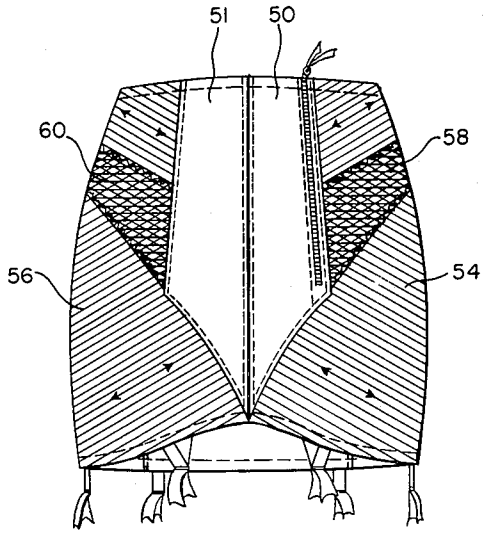


Fig. 5

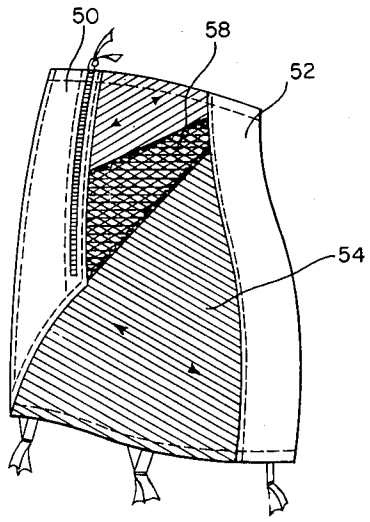


Fig. 6

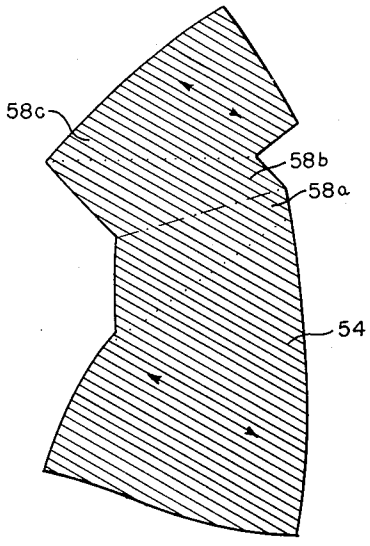


Fig. 7

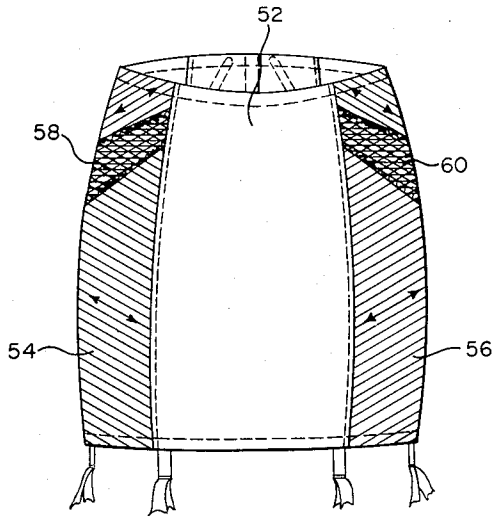


Fig. 8

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GIRDLE

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13 Claims. (Cl. 2—37)

This invention relates to improvements in the construction of foundation garments and has applicability to any of the garments which are generally referred to as all-in-ones, corselettes, girdles, panty girdles, swimming suits and the like.

It is a function of all foundation garments, which will hereafter be called "girdles," to produce a slimming appearance of the body of the wearer, particularly in the abdominal and buttocks regions of the torso. Incidentally, such a girdle may tend to improve the wearer's posture. In practice it has been found that in order for a girdle to accomplish these ends it is necessary for it to exert a pull on the portions of the body which the wearer of the girdle wishes to control, which portions are enclosed within the garment. Moreover, it has been found that by causing the pull to be exerted in a variety of opposing diagonal directions the most effective and efficient control can be obtained.

In the prior art a great many girdle constructions have been devised. Many of those constructions have recognized the need for pull in different directions in order to obtain control over the particular underlying body region. In order to accomplish this end it has been common, for example, to employ a plurality of panels, each consisting of a separate piece of fabric with its elastic warp threads oriented in the desired direction of pull. The orientation of threads in a particular panel is selected to provide pull on the body region controlled in a combination of directions which gives most effective control. For example, in specific garments, strip-like panels have been arranged so that the elastic threads extend radially from the abdominal region in order to make effective the entire pull exerted by each panel to produce abdominal control and "flattening."

The present invention has many of the advantages of the best girdle constructions of the prior art. Moreover, the girdle of the present invention is not only able to exert pull in the desired directions for efficient control, but it is also able to give extra pull where needed to an extent heretofore not possible with known girdle constructions. Nevertheless, the present girdle is capable of being simply made, using relatively conventional manufacturing techniques and is itself a simple structure when completed.

An advantage of the girdle of the present invention is that it may be made from comparatively few pieces of material using relatively simple patterns to cut the pieces and rather simple conventional sewing practices to arrange the panels of material into the proper form. Instead of sewing together pieces of fabric to form panels having different elastic thread orientations, a variety of thread orientations is obtained in those elastic sections where they are needed by the use of governing folds. In the preferred form of the present invention but a single piece of fabric is employed for each side sectional piece, said piece extending from top to bottom of the girdle yet containing therein opposing divergent elastic thread

distensibly obtained through the employment of a governing fold. Of course, there may be, and there commonly is, more than one sectional piece to each of the side sections of the girdle, the various sectional pieces for one side being sewn together in a side-by-side relationship with one another. Each side sectional piece may have a plurality of governing folds in it, the number depending largely on the number of areas in which different directions of pull are required. These governing folds are triple layers of fabric which are advantageously tapered to whatever degree is necessary in order to produce the desired orientation of elastic threads in the areas above and below each fold section and in each fold section for most effective pull on the controlled body regions.

The primary purpose of the present invention is to provide a girdle having at each side of an abdominal covering portion an elastic section including a vertically-intermediate portion of greatest resistance to stretch which will overly and give adequate support to the lower portion of the obliquus externus abdominus muscle, and upper and lower portions of less resistance to stretch having their primary direction of stretch extending in diagonally-opposing directions, that in the lower portion extending downwardly and outwardly and that in the upper portion extending upwardly and outwardly, both with respect to a vertical center line at the front of the girdle. This is accomplished in the preferred form of the invention by providing a single piece of elastic fabric for each elastic section which is cut flat with the elastic warp threads extending in a given diagonal direction, and then folding the intermediate portion of the piece in such manner as to provide a multi-layer intermediate portion of greatest resistance to stretch and the upper and lower portions of less stretch having opposing elastic thread distensibilities as indicated above. The greater resistance to stretch in the intermediate portion results from the folding of the material upon itself in that portion and also from the manner of folding primary lines of stretch in the several folds extending cross-wise to one another.

In the folding of the intermediate portion of the single elastic piece to provide the intermediate portion of greatest resistance to stretch, it is so folded that the lower edge of that portion lies substantially on an outwardly and upwardly-extending line running approximately from the crest of the pubis of the wearer to the crest of the ilium. The lower edge of the intermediate portion of greatest resistance to stretch will then follow approximately the line of the lower edge of the obliquus externus abdominus muscle of the wearer when the girdle is worn.

The folding of each elastic side piece is also carried out so that the upper edge of the intermediate portion terminates along an upwardly and outwardly divergent line which generally follows the upper hip line of the wearer. This can readily be accomplished by folding down a greater amount of the elastic fabric on the front vertical edge than is folded down on the side or back vertical edge. After the single piece of elastic fabric is thus folded it is stitched in place, and the overlapping folded layers, with their lines of primary stretch running cross-wise to one another, will combine their forces and provide, in effect, a reinforcement for the area of the wearer's body extending from the lower edge of the obliquus externus abdominus muscle upwardly to the upper hip line, thereby eliminating any necessity for a separate piece of elastic to provide proper support for this area of the wearer's body. Not only does this folding of the intermediate portion provide a built-in reinforcement which is more effective for its intended purpose, but it provides a garment which is more attractive than if the intermediate portion were made from separate pieces sewed upon one another.

While it is actually necessary to employ only one governing fold to achieve the desired opposing directional distensibilities of the elastic warp threads in each single-piece elastic fabric section, it may, in some instances to obtain a more graceful presentation, be desirable to divide the governing fold into two portions, one of which will extend upwardly from a line approximately opposite the lower edge of the obliquus externus abdominus muscle and the other downwardly from a line lying opposite the upper hip line of the wearer. However, this would be primarily to achieve greater eye appeal in a high-waisted girdle or corselette and would not in any way be limitative upon the invention, which, as far as providing the intermediate portion of greatest resistance to stretch, is primarily concerned with the manipulation of the elastic warp threads to achieve opposing primary directional distensibilities within the intermediate portion of the single piece of elastic fabric above and below the intermediate portion, which distensibilities follow the line of certain muscle pulls of the body.

As far as the present invention is concerned, it is vitally important that no matter how many folds may be employed in the intermediate section, that the lower edge of this section of greatest resistance to stretch have its lower edge lying substantially on a line starting at substantially the central front portion of the body, approximately at the crest of the pubis and diverging upwardly and outwardly to the crest of the ilium of the wearer. Hence, as long as this lower edge is thus maintained, the elastic fabric that must be folded, in order to achieve the desired upward divergent directional distensibilities of the elastic warp threads in the upper portion of the girdle, while yet maintaining the downwardly divergent distensibilities of the elastic warp threads in the lower portion of the same sectional piece, may be divided into any number of portions.

The divergent upwardly and outwardly distensibilities of the elastic warp threads in the upper portions of the elastic side sections exert a force which is counteracted by the divergent downward and outward distensibilities of the primary elastic warp threads in the lower portions, thereby achieving a "flattened" and "controlled" abdominal line of the wearer that is not often possible in elastic girdles. Also, these combined forces of opposing directional pulls of the elastic warp threads encourage the wearer to a better line of posture while still providing a feeling of freedom and ease in the wearing of the girdle. These also tend to eliminate any tendency of the girdle to ride up or creep up on the body and helps the wearer to achieve a feeling of perfect balance of her body in the garment.

This invention will be better understood by specific reference which will be made to the following drawings:

Fig. 1 is a side elevational view of a girdle having four elastic side sectional pieces, each of which elastic pieces utilizes two folds;

Fig. 2 is a front elevational view of the girdle of Fig. 1;

Fig. 3 illustrates a preferred pattern for one of the side elastic sectional pieces employed in the girdle of Figs. 1 and 2 showing the method of cutting the fabric to allow for two tapering folds in accordance with the present invention;

Fig. 4 is a back elevational view of the girdle of Figs. 1–3;

Fig. 5 is a front elevational view of a girdle having two elastic side sectional pieces and having a split front section and a side front opening;

Fig. 6 is a side elevational view of the girdle of Fig. 5 providing a better showing of the unbroken hip line and the one tapering fold, which is employed in each of the elastic sectional pieces;

Fig. 7 illustrates the preferred pattern for one of the side elastic sectional pieces in the girdle of Figs. 5 and 6 showing in particular the method of cutting the fabric to allow for a single fold in this sectional piece;

Fig. 8 is a back elevational view of the girdle of Figs. 5–7.

Referring to Figs. 1–4 the girdle illustrated therein is one which has an upper thigh-covering portion, an abdominal-covering portion, a waist-covering portion and generally comprises a center front panel **10**, a pair of side front sectional pieces **12** and **14** and a pair of side rear sectional pieces **16** and **18** and a center back panel **20**. Front panel **10** and back panel **20** are preferably made of non-elastic material. However, in accordance with the requirements for different types of garments, elastic fabric may be employed for these front and back panels. For example, it is possible that in certain instances a fabric which is stretchable only in the vertical direction may be used for either the front or back panel, or for both. The front side sectional pieces **12** and **14** and the side rear sectional pieces **16** and **18** can be made of any light weight woven elastic fabric but are preferably constructed of a warp knit elastic fabric. In the drawings the diagonal lines and the associated arrows on the sectional pieces of elastic fabric indicate the primary direction of pull using the preferred type of elastic material, and further depict the desired opposing distensibilities of the elastic warp threads in the upper and lower portion of the side front elastic sections.

The side sectional pieces **12**, **14**, **16** and **18** are each provided with two tapering folds. In piece **12** folds **21** and **22** are employed. In piece **14** folds **23** and **24** are employed. In piece **16** folds **25** and **26** are employed; and in piece **18** folds **27** and **28** are employed. These tapered folds constitute vertically-intermediate portions in the side front elastic sections which have greater resistance to stretch than the portions both above and below them, and, as will be noted from the drawings, the lower edges of these intermediate sections are positioned to lie substantially opposite a line extending from a point below the crest of the pubis to the crest of the ilium of a wearer. The upper edge of this intermediate portion generally follows the upper hip line of the wearer. Hence, when the garment is worn the lower edge of the intermediate section of the greatest resistance to stretch will lie opposite the lower edge of the obliquus externus abdominus muscle and give support to the lower portion of that muscle.

As may be seen in Fig. 3, the side front sectional pieces are cut on a designated diagonal of the elastic warp threads, as shown by the directional lines and associated arrows, and the governing folds of these pieces are divided into two equal portions forming a box pleat or double fold arrangement that provides the desired opposing directional orientation of the elastic warp threads in the upper and lower portions of these sections when the folds are properly secured in place. The folds are made in the elastic material prior to securing together the various elastic and non-elastic sections comprising the garment. The folds, after the elastic fabric is folded on the dotted lines, are stitched down flat and held in place by rows of zig-zag or similar stitching which is made with stretchable thread in order to permit maximum stretchability. The patterns for the sectional pieces are so selected that the edges of the finished piece will be smooth and relatively straight for ease in sewing or otherwise securing together to the adjacent pieces. After the panels are stitched they are sewn together in the arrangement shown and the zipper **33** and other additional parts of the garment are added. The side seam below the zipper **33** on the right and left side seams may be fagoted or zig-zagged together while other seaming may be accomplished in any conventional or acceptable manner. Conventional zipper, garter and boning members are used throughout and, hence, will not be described in detail.

It will be noted that the orientation of the folds in the girdle of Figs. 1–4 is such that folds **21**, **22**, **23** and **24** extend radially outwardly from the side seams at the

edges of the front panel **10** and exert a pull generally upwardly from this region. It is important that the folds **22** and **24** be so positioned that their lower edges extend along a line running upwardly and outwardly at an angle of approximately 45° with respect to a vertical line at the front of the girdle. The lower edge of these folds and, consequently, the upper edge of the adjacent lower portion of the front side elastic sections will then follow the lower edge of the obliquus externus abdominus muscles of the body of the wearer. This arrangement simulates and, hence, reinforces the natural muscle pull of the obliquus externus at the upper portion of the girdle and this divergent upward pull has been found to be superior to pull in other directions. It will be noted that when the elastic front side sections are folded along the dotted lines indicated in Fig. 3 to provide the multi-layer folds having greater resistance to stretch, a greater amount of material is folded down on the front vertical edge than is folded down on the back vertical edge. This produces a roughly trapezoidal shape to the folded areas and assists in obtaining the pull above and below those areas in the desired opposing diagonal directions.

Referring to Fig. 1, it will be noted that the folds **23** and **24** of the front side elastic sections are counterbalanced by folds **25** and **26** in the back side elastic sections, which are positioned to overlie the obliquus internus muscle of the wearer. When the folds **25** and **26** are used in conjunction with the folds **23** and **24**, which overlie the lower portion of the obliquus externus abdominus muscle, a greater control of the abdominal area of the wearer is achieved in that one pull balances another.

Referring now to Figs 5–8 the girdle illustrated comprises a center front section composed of a pair of non-stretchable panels **50** and **51**, a pair of side hip sections **54** and **56** and a center back panel **52**. Again the center front section is composed of two panel pieces **50** and **51** and the back panel is preferably made of non-stretchable material but may be made of any suitable fabric in accordance with the requirement of the particular garment. Side hip sections **54** and **56** may be made of any light weight woven elastic but are preferably made with a warp knit elastic fabric.

In the girdle of Figs. 5–8, there are but two folds, one in each of the elastic side sectional pieces **54** and **56**. These folds **58** and **60** extend the full width of the side elastic panels of which they are a part, and like the folds **21**, **22**, **23** and **24** of Figs. 1 to 4, are carefully located to give the desired support to the lower portion of the obliquus externus abdominus muscle while giving the outward and downward distensibilities of the elastic warp threads in the lower portion of the opposite upwardly and outwardly distensibilities in the upper portion of the front elastic side sections, as indicated by the directional lines and associated arrows in the drawings.

The fold **58** in section **54** may be made by cutting the section **54** to a pattern illustrated in Fig. 7 on the diagonal of the elastic warp threads indicated by the directional lines and associated arrows. In folding out the folds along the dotted lines of this figure the illustrated piece will effectively be shortened and the sides will be straightened in order to facilitate sewing the elastic sectional pieces to the adjacent non-stretchable front and back sections of the garment. This folding out of a given amount of the elastic fabric is necessary to the successful manipulation of this single section of elastic fabric to provide the desired opposing directional distensibilities in the upper and lower portions of these sections, the elastic warp threads of the upper portion diverging upwardly and outwardly above the intermediate portion of greatest resistance to stretch, while yet maintaining the downwardly divergent distensibilities of the elastic warp threads in the lower portion of the girdle. Prior to sewing the side sectional pieces in place, however, the fold should be stitched in the manner already described in connection with the Figs. 1–4 garment. In this instance the folds are made somewhat wider as well as longer than in the previously described garment of Figs. 1–4, since the same amount of elastic fabric must be incorporated into this section in order to obtain the desired opposing distensibilities of the elastic warp threads in the upper and lower portions of this section. Furthermore, the folds are made to taper symmetrically up over the hip until they meet the side seams of a center back panel **52**. These folds, like the folds of the garment in Figs. 1–4, are held in place by rows of zig-zag stitching or similar flexible stitching, to provide for maximum stretchability. The center front seam of front panels **50** and **51** can be an open fagoted seam for appearance and ease of construction but other seams should be made in a conventional manner. The zipper, garters and boning members are advantageously of conventional design and accordingly will not be described in detail.

The garment of Figs. 5–8 is of similar construction to the garment of Figs. 1 to 4. From the differences in the two girdles illustrated and described herein it will be apparent to those skilled in the art that the present invention is capable of assuming many forms. For example, to secure greater or less control of specific body regions many variations of the structure shown will occur to those skilled in the art.

It is to be understood that while particular examples of the girdle of the present invention have been illustrated, innumerable varieties of constructions may be made within the scope and the spirit of the claims of the present invention. Within the scope of the claims numerous additions, changes and even omissions of structural details shown and described herein may be made in the invention without departing from the spirit thereof. For example, any number of elastic sectional pieces may be employed in a particular garment. Likewise, any number of folds may be employed in a given sectional piece. Furthermore, the girdle of the present invention may be extended either by adding portions above or below the normal limits of the girdle construction in order to obtain other girdle-like garments commonly manufactured. Modifications of the girdle may make a form of garment somewhat different from a "girdle" as commonly defined in the trade. It is the intended scope of the claims that they shall apply to any girdle-like garment if they would apply were the portions modifying or extending the garment from the basic girdle removed.

I claim:

1. A girdle having an upper thigh covering portion, an abdominal covering portion and a waist covering portion, the front of the girdle including, at each side, a front side elastic section of a single piece of elastic material extending vertically of the girdle, each of said front side elastic sections being folded upon itself transversely of its vertical length and intermediate its ends to provide an intermediate folded portion extending to the respective sides of the girdle, at least a part of which is multi-layer, which is of substantial extent in a vertical direction at both its inner and outer sides and which has a greater resistance to stretch than the upper and lower portions of the front side elastic sections, each of said intermediate folded portions having its lower edge lying along a line extending upwardly and outwardly at an angle of approximately 45° with respect to a vertical line at the front center of the garment and along a line extending from a point below the crest of the pubis, when the garment is worn, along a line generally following the lower edge of the obliquus externus abdominus muscle and over the crest of the ilium of the wearer, the upper edge of said intermediate folded portion of greater resistance to stretch extending in the same general direction as the lower edge thereof and generally following the upper hip line of the wearer, the lower portions of said front side sections having their primary direction of stretch extending downwardly and outwardly with respect to a vertical line at the front center of the girdle, and the upper portions of said front side sections having their primary direction of stretch extend-

ing upwardly and outwardly with respect to such a vertical line.

2. A girdle as defined in claim 1 in which the front side elastic sections are folded along lines to provide intermediate multi-layer portions the upper and lower edges of which converge toward the sides of the girdle.

3. A girdle as defined in claim 1 in which the front side elastic sections are folded to provide a single multi-layer intermediate portion.

4. A girdle as defined in claim 1 in which the front side sections are folded along lines such that the primary directions of stretch in the several folds of the intermediate section of greater resistance to stretch are transverse to one another.

5. A girdle as defined in claim 1 in which the front side elastic sections are folded along a multiplicity of lines providing a plurality of spaced sections at their intermediate portions of greater resistance to stretch than the upper and lower portions of said sections.

6. A girdle having an upper thigh covering portion, an abdominal covering portion and a waist covering portion, the front of the girdle including, at each side, a front side elastic section of a single piece of elastic material extending vertically of the girdle, each of said front side elastic sections being folded upon itself intermediate its ends to provide an intermediate portion, at least a part of which is multi-layer, which is of substantial extent in a vertical direction and which has a greater resistance to stretch than the upper and lower portions of the front side elastic sections, said intermediate portion having its lower edge lying along a line extending upwardly and outwardly at an angle of approximately 45° with respect to a vertical line at the front center of the garment and along a line extending from a point approximately opposite the crest of the pubis, when the garment is worn, along a line generally following the lower edge of the obliquus externus abdominus muscle and over the crest of the ilium of the wearer, the upper edge of said intermediate portion of greater resistance to stretch extending in the same general direction as the lower edge thereof and generally following the upper hip line of the wearer, the lower portions of said front side sections having their primary direction of stretch extending downwardly and outwardly with respect to a vertical line at the front center of the girdle, and the upper portions of said front side sections having their primary direction of stretch extending upwardly and outwardly with respect to such a vertical line, the back of the girdle including, at each side, a back side elastic section having intermediate portions opposite the intermediate portions of the front side elastic sections which have greater resistance to stretch than the upper and lower portions of said back side elastic sections.

7. A girdle as defined in claim 6 in which the primary direction of stretch of the lower portions of said back side elastic sections extends upwardly and outwardly from a back vertical center line .

8. A girdle as defined in claim 7 in which the primary direction of stretch of the upper portions of said back side sections extends substantially circumferentially of the girdle.

9. A girdle as defined in claim 6 in which the primary direction of stretch of the lower portions of said back side elastic sections extends upwardly and outwardly from a back vertical center line and the primary direction of stretch in the upper portions of said back side sections extends downwardly and outwardly from such center line.

10. A girdle as defined in claim 6 in which the back side elastic sections are folded along lines to provide intermediate multi-layer portions the upper and lower edges of which converge towards the sides of the garment.

11. A girdle as defined in claim 6 in which each of the front and back side elastic sections are made from a single piece of folded elastic material.

12. A girdle as defined in claim 6 in which the girdle has center front and back panels of substantially non-elastic material and the intermediate portions of greater resistance to stretch of the front and back side elastic sections extend, respectively, from the front and back panels to the sides of the girdle.

13. A girdle as defined in claim 12 in which the front and back side elastic sections, collectively, bridge the space between the front and back panels.

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