March 8, 1949. G. L. DIEBOLD 2,464,121

DETACHABLE CROTCH UNDERGARMENT

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Fig. 1.

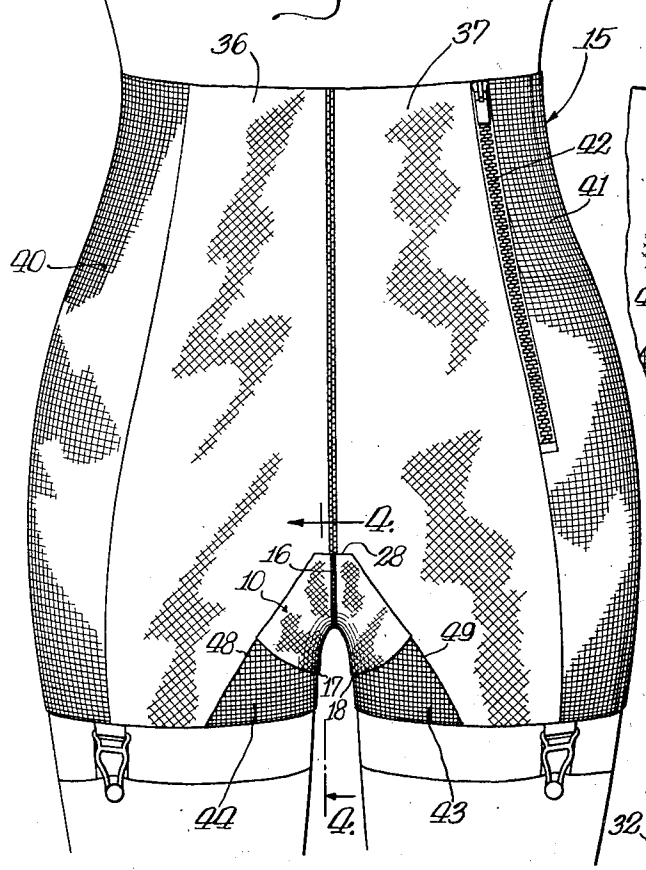

Fig. 3.

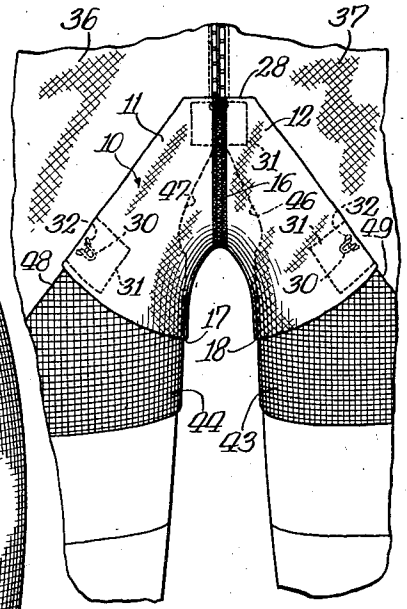

Fig. 2.

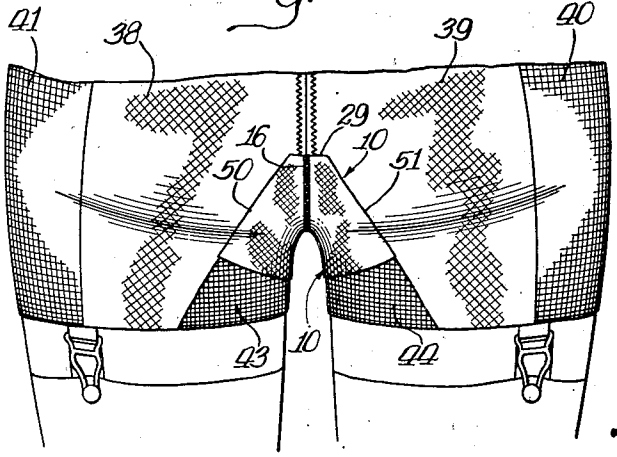

Fig. 4.

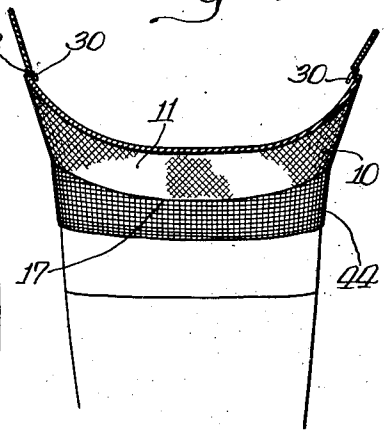

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Fig. 6.

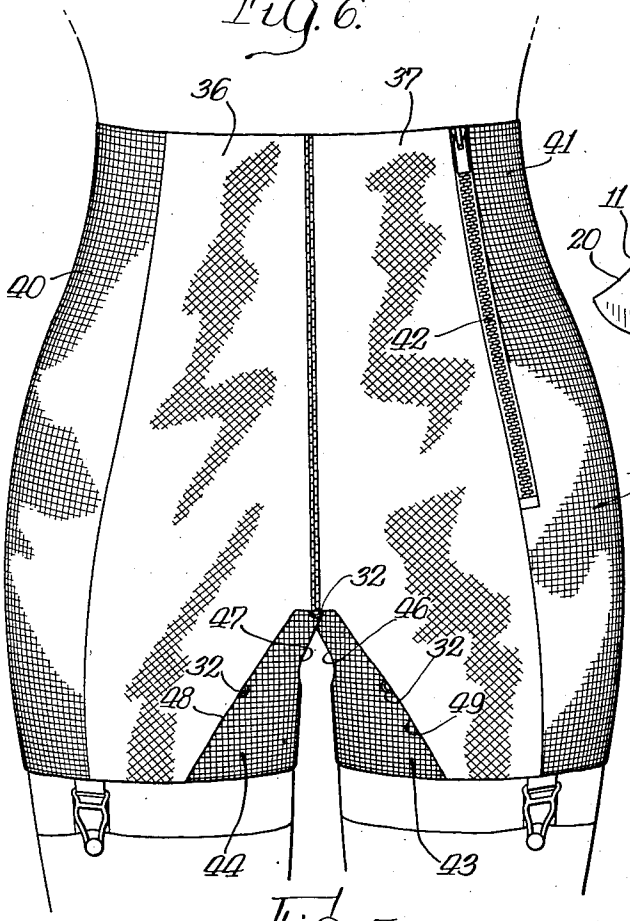


Fig. 7.

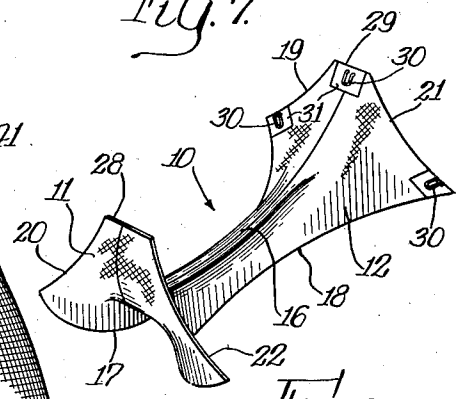


Fig. 8.

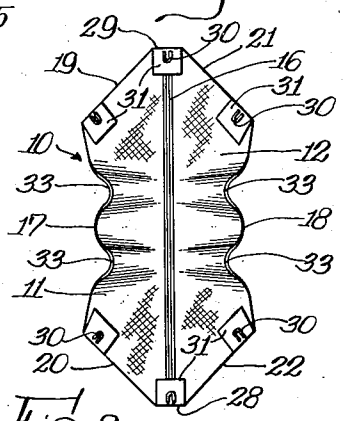


Fig. 5.

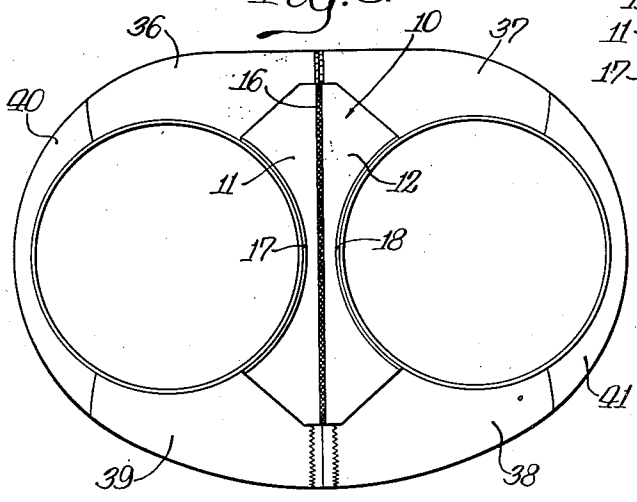
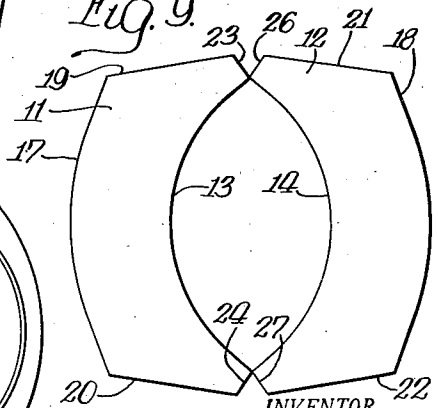


Fig. 9.



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UNITED STATES PATENT OFFICE

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DETACHABLE CROTCH UNDERGARMENT

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Application February 1, 1946, Serial No. 644,830

5 Claims. (Cl. 2—225)

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This invention relates to women's undergarments and more particularly to a girdle, corset or the like having a detachable crotch piece.

It has been long recognized in women's undergarments and particularly with respect to girdles and corsets comprised of elastic material, that it was desirable to have a detachable crotch piece which could be readily removed for laundering or for replacement with a fresh, unsoiled crotch piece or for other purposes. Such detachability of the crotch piece obviated the necessity of frequently laundering the entire garment and thereby prolonged the useful life thereof. Consequently, numerous attempts have been made to devise a detachable crotch piece for such undergarments, but in the main such attempts have proven somewhat unsatisfactory and only partially successful.

Some of such prior crotch pieces were attached to the main body portions of the undergarments in such complicated manners or by such complicated means which often were placed in positions relatively unaccessible to the wearer, that their detachment was rendered extremely difficult and inconvenient. Other crotch pieces, while being readily detachable, were in fact so much so that they tended to become unfastened from the undergarment while being worn, due to the inability of the fasteners to withstand the wearing stresses and strains resulting from bodily movements of the wearer while walking or sitting. Such fasteners were placed in securing position without appreciation of the angles or directions of stress so that the crotch piece became disengaged from the garment to the discomfort of the wearer. In other instances, the fasteners were disposed in the front or back of the garments in such manners as to cause unsightly bulges or projections through the outer garment or as to be in a position to cause discomfort to the wearer while sitting.

In addition, and perhaps the greatest source of failure of the prior undergarments having detachable crotch pieces, was the fact that the crotch pieces were much too bulky and did not conform to the contours of the crotch while being worn. They comprised, as shown for instance in the Miller Patent No. 2,070,515 and in the Bootz Patent No. 2,074,975, flat one-piece elements of various perimetral shapes which when worn became wrinkled or bunched up in a variety of irregular gatherings. Such wrinkling or bunching caused chafing or other discomfort to the wearer, which discomfort was greater in the case of a fleshy person, with the result that

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the crotch pieces were often discarded entirely to eliminate the source of irritation and discomfort. To overcome such wrinkling or folding, it was attempted to provide various means to hold the crotch pieces in extended position, such means including conventional fastening means or elastic leg bands. However, such means failed to accomplish their intended purpose in that they still permitted the crotch piece to slip or fold under the various stresses occasioned by the wearer's bodily movement.

It is, therefore, an object of the present invention to provide an improved crotch piece adapted to be detachably secured to a woman's undergarment, such as a girdle, corset or the like.

Another object of the invention is to provide an undergarment for women, such as a girdle, corset or the like, having an improved detachable crotch piece.

Another object of the invention is to provide an improved undergarment for women of the foregoing character having a preformed crotch piece that is adapted to closely conform to the contour of a wearer's crotch and to lie closely against the wearer's legs without bunching or gathering.

Still another object of the invention is to provide an improved undergarment of the foregoing character having a preformed crotch-conforming crotch piece provided with fastening means so positioned with respect to said garment that it may be readily attached to or detached from the garment by the wearer and which at the same time is capable of successfully resisting the stresses and strains resulting from bodily movements of the wearer while walking or sitting and tending to unfasten the crotch piece from the garment.

A further object of the invention is to provide an improved undergarment of the foregoing character having a preformed crotch piece that is secured to the garment in such a manner and by such means that an outer garment may lie substantially flat or smooth thereover without an unsightly bulge and no discomfort is caused thereby to the wearer either while walking or sitting.

A still further object is to provide an improved undergarment for women of the foregoing character that is adapted to closely conform to the contour of a wearer's crotch and which is provided with means for holding the crotch piece in extended and unwrinkled position at all times while being worn.

Other and further objects and advantages of

the present invention will become apparent as this description progresses, reference being had to the accompanying drawing, in which:

Figure 1 is a front elevational view of a girdle with an improved detachable crotch piece comprising the present invention secured in position thereon and illustrated in position on the body;

Fig. 2 is a rear elevational view of a portion of the girdle and the crotch piece shown in Fig. 1;

Fig. 3 is an enlarged front elevational view of the improved crotch piece in the position shown in Fig. 1 and illustrating the relative position of the crotch piece to the crotch opening of the girdle shown in broken lines;

Fig. 4 is a vertical sectional view taken on the line 4—4 in Fig. 1 looking in the direction of the arrows;

Fig. 5 is a bottom plan view of the girdle and crotch piece illustrated in Fig. 1;

Fig. 6 is a front elevational view of the girdle shown in Fig. 1 but illustrated with the improved crotch piece removed therefrom;

Fig. 7 is a perspective view of the improved preshaped crotch piece comprising the present invention and illustrated in the unwrinkled and ungathered position it assumes when mounted in position on a girdle when being worn;

Fig. 8 is a top plan view of the improved crotch piece illustrated in detached position on a flat surface; and

Fig. 9 is a plan view of the two sections of the preshaped crotch piece prior to their being joined together as a unitary crotch piece.

The improved crotch piece 10 comprising the present invention and illustrated specifically in Figs. 7 to 9, inclusive, of the drawings is preshaped and is adapted to be secured to an undergarment such as a girdle 15 on a wearer's body, in such a manner that it remains unwrinkled and ungathered and substantially conforms to the contours of the wearer's crotch and to the sides of the wearer's legs in the operative position shown in Fig. 7. The crotch piece 10 is comprised of two sections 11 and 12 secured together along their adjacent or opposed longitudinal edges 13 and 14 such as by stitching, indicated by the numeral 16 in Figs. 7 and 8. The sections 11 and 12 may be cut from a piece of elastic or inelastic material in the shape shown in Fig. 9 so as to be provided with inwardly curving longitudinal edges 13 and 14, respectively, on their adjacent sides and with outwardly curving longitudinal edges 17 and 18, respectively, on their other or remote sides. The front and rear edges 19 and 20 and 21 and 22 of the sections 11 and 12 are straight and are inclined inwardly and upwardly from the remote longitudinal edges 17 and 18 toward the inner longitudinal edges 13 and 14 thereof. Each of the sections 11 and 12 are also provided with short inclined edges 23 and 24 and 26 and 27, respectively, which are angularly disposed between the edges 19, 20 and 13, respectively, and 21, 22 and 14, respectively.

After the sections 11 and 12 have been cut out in the perimetral outline as above described and shown in Fig. 9, they may be stitched together along their curved longitudinal edges 13 and 14, after which the edges 17, 19, 20, 23 and 24 of the section 11 and the edges 18, 21, 22, 26 and 27 of the section 12 may be folded over inwardly a slight distance and stitched down to provide hemmed edges. Thus, as assembled, the preshaped crotch piece 10 is provided with two curved outer longitudinal edges 17 and 18, upwardly and inwardly inclined straight edges 20 and 22 and 19 and 21, straight horizontal edges 28 and 29 at its front and rear ends, respectively, and a curving or concave central longitudinal portion 16 which curves under the crotch from front to rear.

The crotch piece 10 is also provided with fastening means for detachably securing it to the girdle 15, which means comprises a plurality of hooks 30 carried by reinforcing and covering tabs 31 which in turn are stitched to the top surface of the crotch piece 10, the hooks 30 being adapted to detachably engage a plurality of eyes 32 carried by the girdle 15 at the front and rear thereof. As shown particularly in Figs. 3, 7 and 8 of the drawings, the hooks 30 are spaced apart in groups of threes at the front and rear of the crotch piece 10, hooks 30 being adjacent the uppermost edges 28 and 29 and the other hooks 30 being spaced downwardly and outwardly therefrom adjacent the corners formed by the intersection of the inclined edges 19 and 21 and 20 and 22 with the curved outer longitudinal edges 17 and 18, respectively. It is to be noted that each of the uppermost hooks 30 adjacent the edges 28 and 29 at the front and rear of the crotch piece 10 is directed downwardly and that each of the hooks 30 adjacent the above-identified corners is also directed downwardly but somewhat inwardly so as to be angularly disposed with respect to the uppermost hook 30 and also with respect to each other.

As shown in Fig. 8, the crotch piece 10 in completed form is incapable of lying flat on a level surface but because of its shape and manner of construction, being composed of sections 11 and 12 stitched together along inner curved edges, it necessarily resolves itself into folds, indicated by the numeral 33, intermediate its ends. However, when the crotch piece 10 is extended, as shown in Fig. 7, into the position it normally would assume when secured to a girdle on a wearer's body so that the ends thereof are elevated and spread, it is entirely devoid of wrinkles or folds or gatherings over its entire surface, since it conforms substantially to the natural overall contours of the human crotch and is maintained in extended position and in flush-fitting relation to the wearer's legs by the spaced fastening means above referred to and described in more detail hereinafter.

The improved crotch piece 10 may be detachably secured to any one of a variety of conventional types of open crotch undergarments, but for the purposes of this description it has been illustrated as applied to a girdle 15 having an open crotch and commonly known as a panty girdle. The girdle 15, as shown more particularly in Figs. 1 to 6 of the drawings, comprises generally front panels 36 and 37, rear panels 38 and 39, side panels 40 and 41, and a closure member 42 of the conventional slide fastener type. These panels 36 to 41, inclusive, comprising the girdle unit may be composed of elastic or inelastic material in varying combinations depending upon the desired cost and ultimate characteristics of the garment, wherein some panels may be elastic and others inelastic and the elastic panels may be stretchable either in a vertical or horizontal direction or both. The inner bottom corners of the front panels 36 and 37 and the rear panels 38 and 39 are cut away in an inverted V-shape, thereby providing downwardly and outwardly inclined edges 48 and 49 and 50 and 51 at the front and rear thereof. It is to be noted that the angles of inclination of the edges 19 and 21 and 20 and 22 of the crotch piece 10 are substan-

tially at the same angles and conform to the corresponding inclined edges 48 and 49 of the front panels 36 and 37 and the inclined edges 50 and 51 of the rear panels 38 and 39.

As shown in Fig. 6 of the drawings, the lower inclined edges 49 and 50 of the front and rear panels 37 and 38 and the lower inclined edges 48 and 51 of the front and rear panels 36 and 39 are connected by inner leg-forming bands 43 and 44, respectively, which may also be composed of elastic or inelastic material. The leg bands 43 and 44 are each cut away at their upper portions, as indicated by the numerals 46 and 47 in Fig. 6 of the drawings, so as to provide an open crotch.

The eyes 32 of the detachable fastening means are spaced apart and secured to the front and rear of the girdle 15 relative to each other in a manner corresponding to the spacing and arrangement of hooks 30 on the end portions of the crotch piece 10, an eye 32 being secured to the front panels 36 and 37 at the top of the V-shaped cut thereof and eyes 32 being spaced downwardly and outwardly from the top eye along the inclined edges 48 and 49 of the cut. Similarly at the back of the girdle 15, an eye 32 is secured to the rear panels 38 and 39 at the top of the V-shaped cut thereof with two more eyes 32 being spaced downwardly and outwardly from the rear top eye along the inclined edges 50 and 51 of the rear cut.

The girdle 15 above described may be worn, if desired, as an open crotch garment without the crotch piece 10 as illustrated in Fig. 6; or the crotch may be closed or covered by means of the improved crotch piece 10 which may be readily secured to the girdle 15 by inserting the spaced hooks 30 through the spaced eyes 32 at the front and rear thereof. The crotch piece 10 may be detachably secured to the girdle 15 before the girdle is put on by the wearer, but it may with ease be so secured even after the girdle is in position on the body. The eyes 32 present themselves in positions at the front and rear of the girdle 15 that are readily accessible to the wearer, thereby facilitating the attachment or detachment of the crotch piece 10.

When the crotch piece 10 is secured in operable crotch closing position on the girdle 15 on the body of the wearer, it will assume the position illustrated in Figs. 1, 2, 4 and 7 of the drawings, wherein it curves under the crotch and upwardly at its front and rear end portions in a curve substantially corresponding to that formed by the curved edges 13 and 14 that have been stitched together in preshaping it. In other words, the crotch piece 10 is unwrinkled and unfolded only in operable position whereas wrinkles and folds do appear, as shown in Fig. 8, when in any other position. The intermediate portions of the crotch piece sections 11 and 12 extend downwardly and lie flush against the inner portions of the wearer's legs, thereby covering the open crotch formed by the openings 46 and 47 of the inner leg bands 43 and 44 and overlapping to some extent those portions of the leg bands 43 and 44 below the openings 46 and 47 thereof. However, the sections 11 and 12 of the crotch piece 10 are of a width sufficient only to insure a slight overlapping of the leg bands 43 and 44 so as to prevent their extending downwardly more than is necessary and thereby causing undue bulk between the wearer's legs.

The front and rear top hooks 30 serve to retain the crotch piece 10 on the girdle 15 while

the lower downwardly and outwardly spaced hooks 30 not only serve to secure the crotch piece 10 to the girdle 15 but also maintain the crotch piece 10 in spread or extended position, the lower hooks 30 being adjacent the outer or lower longitudinal edges 17 and 18. The crotch piece 10 is thus held in spread or extended condition in the crotch against wrinkling or folding which normally tends to result from bodily movement of the wearer. The lower edge portions 17 and 18 of the sections 11 and 12 of the crotch piece are caused to lie flat against the inner surfaces of the wearer's legs while the upper front and rear portions thereof are spread smoothly over the front portion of the girdle 15 so as to cover the crotch opening and blend in with the curving contours of the girdle, thereby permitting the outer garment of the wearer to lie flat thereover without presenting unsightly bulges. The position of the hooks 30 and eyes 32 is also such that they are positioned within the beginning of the sloping hollows formed at the front and rear top portions of the crotch, and thus the fastening means do not project outwardly beyond the general vertical plane of the girdle when on the wearer's body and the wearer is not caused to sit on them.

Although the crotch piece 10 may be readily detached from the girdle 15 when desired, detachment thereof will never occur through inadvertence due to the body movement of the wearer. The spaced and angular relative arrangement of the hooks 30 on the crotch piece 10 and of the eyes 32 on the girdle 15 is such that the hooks and eyes remain in engagement at all times regardless of the degree of stress or strain resulting from bodily movement or from different bodily positions and regardless of the angle at which the stresses or strains may be exerted thereagainst.

Although there has been shown in the drawings and described above one preferred embodiment of my invention, it will be apparent that variations and modifications thereof may be made without departing from the underlying principles of the invention. It is intended, therefore, by the following claims to include within the scope of the invention all such variations and modifications by which the results of the invention may be substantially obtained through the use of substantially the same or equivalent means.

I claim:

1. A crotch piece adapted to be detachably secured to an undergarment and to be maintained thereon without wrinkling or folding when said undergarment is being worn comprising two fabric sections, each section having an upper longitudinal edge curving inwardly and downwardly from its end portions to substantially conform to the curvature of the center line of the wearer's crotch, a bottom longitudinal edge curving downwardly from its end portions so as to extend diagonally upwardly on the wearer's legs at the front and rear thereof and straight edges at the front and rear thereof inclined upwardly and inwardly from said bottom longitudinal edge toward said upper longitudinal edge, said sections being secured to each other along their curving upper longitudinal edges, and fastening means carried on the front and rear portions of said complemental sections and adapted to be detachably engaged with cooperating fastening means on an undergarment at the lower portions of the front and rear thereof.

2. A crotch piece adapted to be detachably

secured to an undergarment and to be maintained thereon without wrinkling or folding when said undergarment is being worn comprising two fabric sections, each section having an upper longitudinal edge curving inwardly and downwardly from its end portions to substantially conform to the curvature of the center line of the wearer's crotch, a bottom longitudinal edge curving downwardly from its end portions so as to extend diagonally upwardly on the wearer's legs at the front and rear thereof and straight edges at the front and rear thereof inclined upwardly and inwardly from said bottom longitudinal edge toward said upper longitudinal edge and short straight edges at the front and rear thereof angularly disposed and inclined downwardly with respect to said upwardly inclined edges and connecting said upwardly inclined edges and said curving upper longitudinal edges, said sections being secured to each other along their curving upper longitudinal edges, and fastening means carried on the front and rear portions of said complemental sections and adapted to be detachably engaged with cooperating fastening means on an undergarment at the lower portions of the front and rear thereof.

3. A crotch piece adapted to be detachably secured to an undergarment and to be maintained thereon without wrinkling or folding when said undergarment is being worn comprising two fabric sections, each section having an upper longitudinal edge curving inwardly and downwardly from its end portions to substantially conform to the curvature of the center line of the wearer's crotch, a bottom longitudinal edge curving downwardly and inwardly from its end portions so as to extend diagonally upwardly on the wearer's leg at the front and rear thereof and straight edges at the front and rear thereof inclined upwardly and inwardly from said bottom longitudinal edge toward said upper longitudinal edge, said sections being secured to each other along their curving upper longitudinal edges, and a plurality of spaced fastening means carried on both the front and rear portions of said sections and adapted to be detachably engaged with cooperating fastening means on an undergarment at the lower portions of the front and rear thereof, said fastening means being secured to said crotch piece adjacent its front and rear upper extremities and adjacent each of the corners formed by the intersection of the bottom curved longitudinal edges with the upwardly inclined edges.

4. An undergarment comprising a body girdle having an open crotch at the bottom portion thereof, a crotch piece adapted to be detachably secured to said girdle to cover and close said crotch opening, said crotch piece being comprised of two complemental sections having upper longitudinal edges curving inwardly and downwardly from their end portions to substantially conform to the center line of the wearer's crotch, bottom longitudinal edges curving downwardly and inwardly from their respective end portions so as to extend diagonally upwardly on the wearer's legs at the front and rear thereof and straight edges at the front and rear thereof inclined upwardly and inwardly from said bottom longitudinal edge toward said upper longitudinal edges, said sections being secured to each other along their curving upper longitudinal edges, and fastening means for detachably securing said crotch piece to said girdle over the crotch opening comprising fastening elements secured to said crotch piece at its front and rear upper extremities and adjacent each of the corners formed by the intersections of the bottom curved longitudinal edges with the upwardly inclined edges, and cooperating fastening elements carried on the lower front and rear portions of the girdle adjacent the crotch opening and adapted to be detachably engaged by the fastening elements of the crotch piece, said cooperating fastening elements being secured to the girdle in spaced relationship corresponding to the spaced relationship of the fastening elements on the crotch piece.

5. An undergarment comprising a body portion and leg portions adapted to closely fit a wearer's body and legs, the body and leg portions being cut away to provide a crotch opening and to provide leg bands adapted to extend around the wearer's legs below the crotch, a crotch piece adapted to be detachably secured to said body portion to cover and close said crotch opening, said crotch piece being comprised of two complemental sections having inwardly curving longitudinal edges, outer longitudinal edges and edges at the front and rear thereof inclined inwardly and upwardly from said outer longitudinal edges toward said inner longitudinal edges, said sections being secured to each other along their inner longitudinal edges and being of sufficient width to extend downwardly and outwardly from the central portion of the crotch in close flush-fitting relation with the wearer's leg and the leg bands to a point slightly below the top edges of said leg bands in overlapping relation therewith, and fastening means for detachably securing said crotch piece to said garment body portion over the crotch opening comprising spaced fastening elements secured to said crotch piece at its front and rear upper extremities and downwardly and outwardly from said upper extremities adjacent each of the corners formed by the intersections of the outer longitudinal edges with the upwardly inclined edges and cooperating fastening elements carried on the lower front and rear portions of the garment body portion adjacent the crotch opening and adapted to be detachably engaged by the fastening elements of the crotch piece, said cooperating fastening elements being secured to the garment body portion in spaced relationship corresponding to the spaced relationship of the fastening elements on the crotch piece and said fastening elements adjacent each of said corners serving to maintain the sections of the crotch piece in extended, unwrinkled position against the wearer's leg and the leg bands.

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