

Jan. 24, 1961

F. M. SMITH

2,969,067

BRASSIERES

Filed July 8, 1959

Fig. 1.

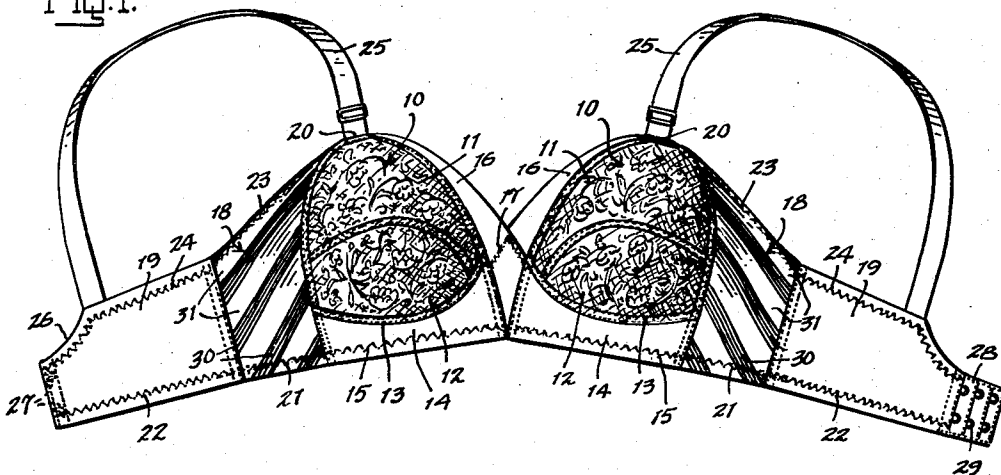


Fig. 2.

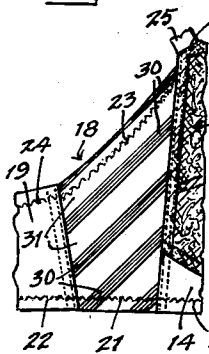


Fig. 3.

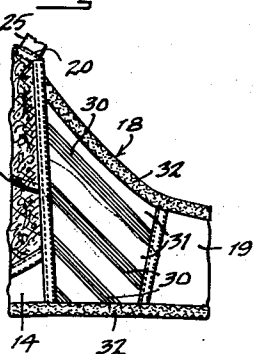


Fig. 4.

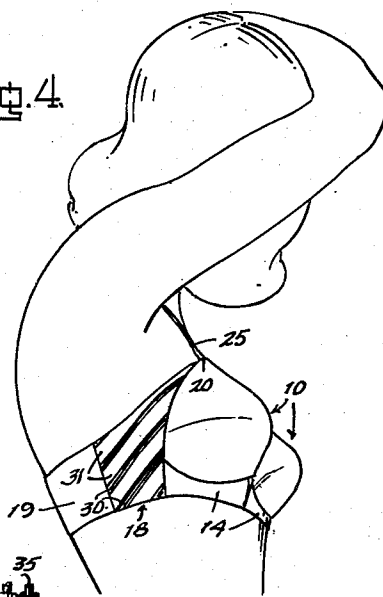


Fig. 5.

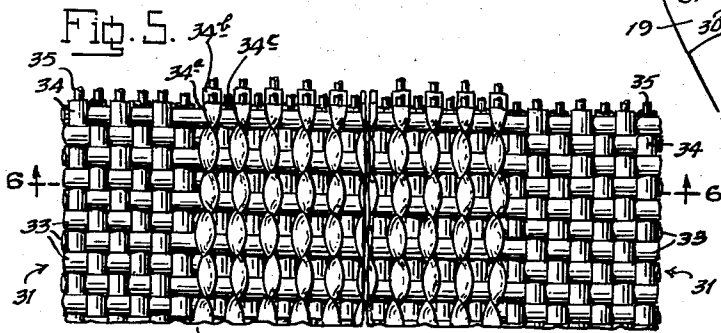
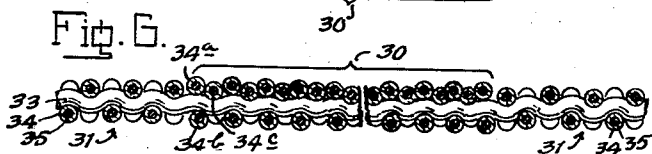


Fig. 6.



INVENTOR.
FRANCES M. SMITH
BY *Francis M. Smith*

ATTORNEY.

1

2,969,067

BRASSIERES

Frances M. Smith, Bridgeport, Conn., assignor to The La Resista Corset Company, Bridgeport, Conn., a corporation of Connecticut

Filed July 8, 1959, Ser. No. 825,714

7 Claims. (Cl. 128—489)

The present invention relates to brassieres, and has for an object to provide a brassiere including improved means for obtaining the desired supporting and molding functions of the garment, while at the same time allowing free movement of the body with the least amount of restraint compatible with the comfort and well-being of the wearer.

The conventional brassiere structure comprises a circumferentially yieldable body encircling band including a pair of forward breast cups, a pair of side sections for disposition in the general region below the arm pits, a pair of rearward back band sections, usually joined together by fasteners such as hooks and eyes, and a pair of shoulder straps which extend from the upper edges of the breast cups to the upper edges of the back band sections at each side of the fasteners. Thus the brassiere is held in place by the circumferential tension of the body encircling band structure which is generally stretchable horizontally and by the vertical support provided by the shoulder straps. By virtue of the fact that the forward connections of the shoulder straps to the upper edges of the breast cups are at substantially higher points than the main body of the horizontally stretchable body encircling band, the vertical pull exerted by the shoulder straps results in a diagonal pull and tension from the forward connection points across the upper edges of the side sections to the forward ends of the upper edges of the back band sections. In order to provide circumferential tension in the body encircling band certain component parts, particularly the side sections below the arm pits, are constructed of one-way stretch elastic fabric, and where the fabric has a uniform modulus of elasticity over its entire area it is found that varying degrees of bulging occur in the fleshy portions of the body located below the arm pits, particularly during the normal movements of the wearer in raising the arms and in assuming various postures such as bending, sitting and standing.

Attempts have been made heretofore to provide side sections designed to prevent such bulging, and these for the most part have consisted in providing a combination of superimposed stretchable members formed of one-way stretch fabric of uniform modulus and arranged so that their individual directions of stretch are disposed in angular relation to each other. These arrangements are not only bulky and of uneven thickness, usually having the members overlapping over substantial portions of their areas, but failed to provide the desired supporting and molding functions in that excessive horizontal restraint and tension is exerted in these areas where a generally diagonal tension is best suited to obtaining the highest degree of support and molding with the least restraint. It has also been proposed to provide the desired control by placing the side sections on the bias to thus restrict the horizontal stretch of the elastic fabric.

In order to maintain the desired restraint and control of the flesh in the underarm areas of the body while still providing side sections of relatively thin material having generally low resistance to stretch, it is proposed accord-

2

ing to the invention to provide the side sections of one-way resiliently stretchable fabric material of a given modulus of elasticity having a series of spaced parallel relatively narrow auxiliary strength or extra modulus resiliently stretchable bands integrally woven, knitted, or otherwise suitably incorporated in the material and having a substantially higher degree of resistance to stretch than the main body of the material.

As a result, a garment is produced having the comfort and attractiveness attendant upon the use of relatively thin single thickness fabric material in the side sections, wherein effective support and restraint are distributed to the desired regions of the side sections and the adjacent breast cups and back bands, while at the same time obtaining the desired body molding function of the side sections through the smooth fitting, body-conforming and yieldable nature of the main body of the fabric material, enhanced and controlled by the stabilizing effect of the auxiliary strength resiliently stretchable bands incorporated therein.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a front elevation of a brassiere according to the invention, wherein the back band sections are shown in flat position while the breast cups and side sections are shown in an extended position;

Fig. 2 is a fragmentary front elevation of the left hand side section and adjacent parts of the brassiere, the same being shown in flat position;

Fig. 3 is a rear elevation of the side section as shown in Fig. 2;

Fig. 4 is a perspective view showing the brassiere in use upon a wearer;

Fig. 5 is a plan view on an enlarged scale and partially broken away, of a piece of the fabric material employed in the construction of the side sections;

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 5;

Referring to the drawings, and more particularly to Fig. 1, the brassiere, according to the exemplary embodiment of the invention illustrated therein, comprises a pair of breast cups 10—10 of conventional construction, each consisting of two pieces of suitably shaped material 11 and 12 joined along a curved seam 12 to impart the desired rounded shape thereto when extended, each breast cup being joined at its lower edge by a seam 13 to the upper concavely curved edge of a front panel member 14, preferably formed of one-way stretch fabric material resiliently stretchable in a vertical direction, the lower margin of the front panel member having an in-turned hem secured by zig-zig or ladder stitching 15. The inner edges of the breast cups, which extend from the upper shoulder strap connection apex points of the breast cups, are continuous with the inner edges of the front panels 14 which extend in convergent relation to the lower edge of the brassiere to form a V-shape, and to each of these continuous edges there is secured a strip 16 of generally elongated triangular shape formed of suitable fabric material folded upon itself, its inner and outer edges diverging downwardly from the apex point to its relatively wide lower edge. The two strips secured to the respective breast cups are overlapped at their lower end portions and their lower edges are respectively secured to the inner edges of the front panel 14 of the opposite breast

cups, the overlap portions of the strips being preferably secured by stitching 17 in the design of an inverted V-shape.

A pair of side sections 18—18 have their forward edges secured along the continuous outer edges of the breast cups 10 and the front panels 14 from substantially the upper apex points of the breast cups to the lower edge of the brassiere, and have their rearward edges secured to the inner edges of a pair of back band sections 19—19, preferably formed of one-way stretch material resiliently stretchable in a horizontal direction. Their lower edges are in a substantially continuous line with the lower edge of the brassiere, while their upper edges are in a line spaced substantially below the apex points of the breast cups. The lower edges of the side sections are also in a substantially continuous line with the lower edge of the brassiere, while their upper edges are in a diagonal line extending substantially from the apex points 20 of the breast cups to the upper edges of the back band sections. The lower margins of the side sections and the back band sections have in-turned hems respectively secured by zig-zag or ladder stitching 21 and 22, and their upper margins similarly have in-turned hems respectively secured by zig-zag or ladder stitching 23 and 24.

A pair of shoulder straps 25—25 are respectively connected at their forward ends to the apex points of the breast cups 10 and at their rearward ends to the upper edges of the back band sections 19 at points intermediate the ends of these upper edges, the upper edges of the back band sections being downwardly inclined, as at 26, from the points of attachment of the shoulder straps to the outer extremities of the back band sections. One back band section is provided upon the inner side of its outer end with suitable fastening means, shown in the form of a pair of hooks 27, while the other back band section is provided at its outer end with a tab extension 28, having several longitudinally spaced pairs of eye members 29 secured thereto for adjustable connection with the hooks 27.

Each of the side sections 18, according to the invention, comprises a single piece of one-way stretch elastic fabric material, having incorporated therein a series of spaced parallel auxiliary strength or extra modulus bands 30 having substantially greater resistance to stretch than the main body of the fabric consisting of the relatively wider bands 31 between the bands 30. In the preferred arrangement the material has its normal direction of stretch disposed diagonally in a downwardly inclined direction from the outer edge of the breast cup 10 to the inner edge of the back band section 19, the angle being preferably substantially 45° to the horizontal lower edge of the side section and also being substantially parallel to the upper inclined edge. In the flat position of the side section as seen in Figs. 2 and 3, the edge joined to the breast cup is in a substantially straight line, the curved line of this edge as seen in Figs. 1 and 4 being the line it takes when the breast cups are extended and the brassiere is fitted upon the body. The hem in the upper diagonal edge is preferably folded along the center of the uppermost auxiliary strength bands 30, and as clearly shown in Fig. 2 the fold may if desired be along a slightly concavely curved line for better conforming fit to the curves of the body. At the inner side of the brassiere, the in-turned hems at both the upper and lower edges of the brassiere are preferably covered with soft textured elastic tape 32 as seen in Fig. 3.

In practice it has been found that a suitable width for the bands 30 is approximately $\frac{3}{8}$ " and for the bands 31 approximately $\frac{5}{8}$ ". It has also been found in practice that the bands 30 should preferably have an elastic strength of approximately twice that of the bands 31, the relative differential in the respective widths of the bands 30 and 31 being such that the resistance to stretch of the composite material is substantially balanced or

equalized over its entire area thus eliminating the tendency of the fabric to wrinkle as it is stretched. This is of particular importance due to the fact that horizontal pull in a bias direction to the diagonal direction of the bands 30 and 31 is exerted by the body encircling band of the brassiere in the lower regions of the side sections, while diagonal pull substantially parallel of the diagonal direction of the bands is exerted between the apex points 20 of the breast cups where the shoulder straps are connected and the upper edge of the back band section. Thus there is a gradual transition in the degree of bias of the direction of the pull from the non-bias diagonal pull line at the upper edge to the maximum bias horizontal pull line at the lower edge. Also, in the lower regions, where the substantially horizontal pull of the body encircling band is in an increasingly bias direction to the normal direction of stretch of the material, there is greater resistance to stretch than in the upper regions, where the diagonal pull becomes increasingly parallel to the normal direction of stretch of the material. While the resistance to stretch is therefore less in the upper regions of the side sections than in the lower regions, this condition is compensated for by the auxiliary strength bands 30 which provide the required restraint in the upper regions of the side sections to maintain effectual supporting and molding engagement with the areas of the body below the arm pits as the wearer assumes different postures. At the same time the relatively narrow width of the bands 30 and their spaced arrangement is such that restraining pressure is distributed upon the body in a manner to minimize harmful binding pressures.

The invention contemplates other suitable arrangement of the side sections to obtain the desired control provided by the auxiliary strength bands. Thus, the bands may be horizontally or otherwise suitably arranged and their number and spacing may be varied to suit the particular design and requirements of the garment.

While the fabric material of the side sections may be produced in any suitable manner, as for instance by weaving, knitting, or other suitable methods, such material is preferably a woven fabric as shown in Figs. 5 and 6. This fabric consists of fill yarns 33 of spun cotton, wool or suitable synthetic fibres, which yarns are substantially non-stretchable, except for the slight degree of elastic stretch normal to such spun yarn, and interwoven therewith are elastic warp yarns 34, each comprising an elastic core 35 in the form of a filament of rubber or other suitable elastic material about which the yarn is spun. In the body portions 31, the fill and warp yarns are woven in conventional basket weave fashion, while in the auxiliary strength bands 30 the warp yarns are woven so that there are substantially twice as many warp yarns to a given width of the material as they are warp yarns in the body portions 31 for the same width. The weaving pattern for example consists of successive groups of three warp yarns 33a, 33b and 33c, the yarns 33a and 33b being carried over and under pairs of fill yarns while the third yarn 33c of the group is carried over and under single fill yarns, the three yarns of the group being tightly compacted during the weaving operation. In practice a band 30 of $\frac{3}{8}$ " in width preferably consisting of approximately 16 groups of three warp yarns each, or 48 warp yarns occupying the $\frac{3}{8}$ " width, whereas there would preferably be approximately 24 warp yarns in the bands 31 for the corresponding width of $\frac{5}{8}$ ". Consequently the resistance to stretch in the bands 30 is approximately twice that of the bands 31. As is clear from Fig. 6 the thickness of the bands 30 approximately corresponds to the thickness of the adjacent body portions 31 and their inner and outer surfaces are substantially flush with the inner and outer surfaces of the body portion, so that both the inner skin engaging side and the outer exposed side present substantially continuous smooth surfaces.

What is claimed is:

1. In a brassiere, a front section comprising a pair of breast cup means, horizontal panel means extending along the lower edge of said cup means and having outer side edges continuous with the outer side edges of said cup means, a pair of quadrilateral elastic side sections each having a forward side edge co-extensive with and respectively connected to the continuous outer side edge of said cup and panel means, a diagonal top edge extending downwardly and rearwardly, a substantially horizontal bottom edge, and a rearward side edge, a pair of substantially horizontally extending back band sections having inner end edges co-extensive with and respectively connected to the rearward side edges of said side sections and having outer end edges connectable to each other at the back of the brassiere, the lower portion at least of said respective back band sections being in horizontal line with said front panel means and entirely spaced therefrom by said side sections, and a pair of shoulder straps respectively connected between the upper end portions of said breast cup means and said back band sections, each of said side sections comprising a single thickness piece of one-way stretch elastic fabric having its normal stretch direction substantially parallel to said diagonal upper edge and bias to said rearward side edge, and a plurality of spaced parallel longitudinally stretchable one-way stretch elastic bands integrally embodied in said said fabric in parallel relation to its normal stretch direction and having greater resistance to stretch than the adjacent body of said fabric, at least certain of said bands of each side section being in its lower portion in horizontal line with said front panel means, and at least certain of said bands being substantially parallel and contiguous to its diagonal upper edge.

2. A brassiere as defined in claim 1, wherein said bands are of approximately corresponding thickness to the adjacent body of the fabric with their inner and outer surfaces substantially flush with the inner and outer surfaces of said adjacent body of the fabric.

3. A brassiere as defined in claim 1, wherein said bands are equally spaced.

4. A brassiere as defined in claim 1, wherein the diagonal normal stretch direction of each of said side

sections is at an angle of approximately 45° to its bottom edge.

5. A brassiere as defined in claim 1, wherein the width of said bands is less than the width of the fabric between said bands.

6. A brassiere as defined in claim 5, wherein the width of said bands is of the order of about $\frac{3}{8}$ " and the width of the material between said bands is of the order of about $\frac{5}{8}$ ".

7. In a brassiere, a front section comprising a pair of breast cup means, horizontal panel means extending along the lower edge of said cup means and having outer side edges continuous with the outer side edges of said cup means, a pair of quadrilateral elastic side sections each having a forward side edge co-extensive with and respectively connected to the continuous outer side edge of said cup and panel means, a diagonal top edge extending downwardly and rearwardly, a substantially horizontal bottom edge, and a rearward side edge, a pair of substantially horizontally extending back band sections having inner end edges co-extensive with and respectively connected to the rearward side edges of said side sections and having outer end edges connectable to each other at the back of the brassiere, the lower portion at least of said respective back band sections being in horizontal line with said front panel means and entirely spaced therefrom by said side sections, and a pair of shoulder straps respectively connected between the upper end portions of said breast cup means and said back band sections, each of said side sections comprising a single thickness piece of one-way stretch fabric having its normal stretch direction substantially transverse to the side edges, and a plurality of spaced parallel longitudinally stretchable one-way stretch elastic bands integrally embodied in said fabric of said side sections in parallel relation to its normal stretch direction and having greater resistance to stretch than the adjacent body of said fabric.

References Cited in the file of this patent

UNITED STATES PATENTS

2,128,764	Smith et al. _____	Aug. 30, 1938
2,703,886	Lo Cascio _____	Mar. 15, 1955