

**July 16, 1968**

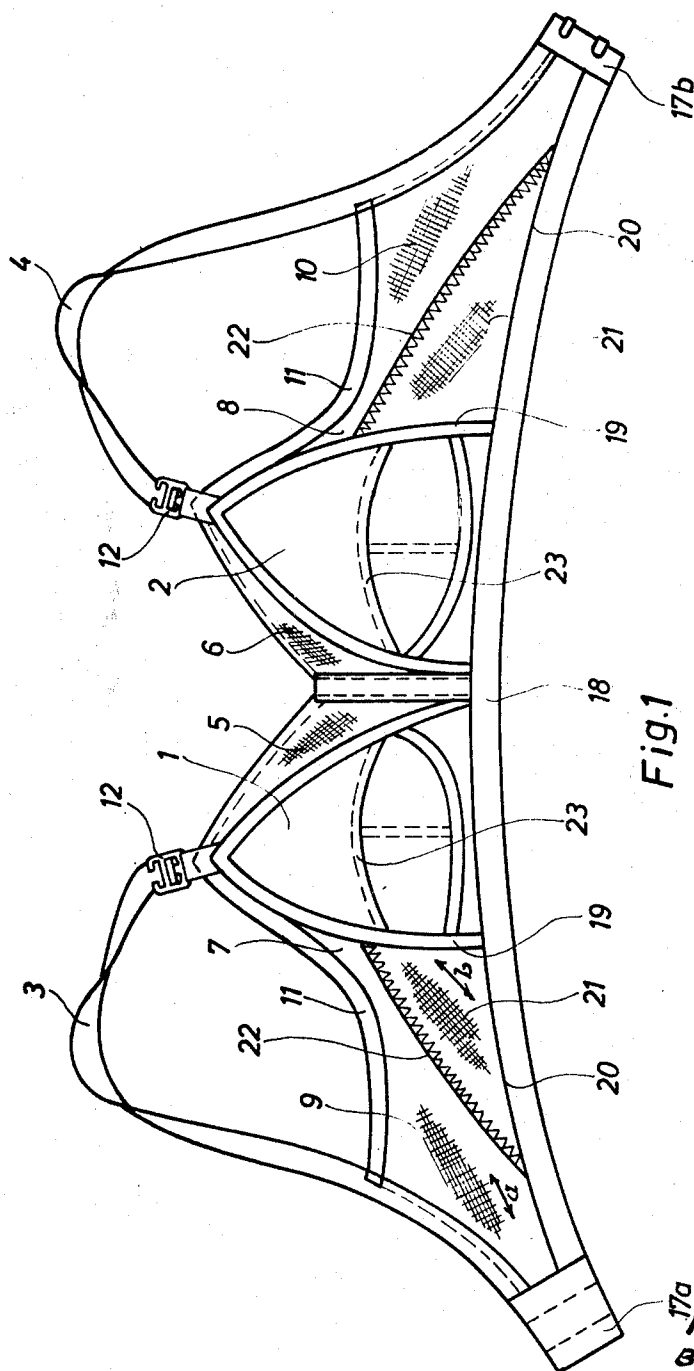
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**3,392,732**

BRASSIERE

Filed Feb. 16, 1966

3 Sheets-Sheet 1



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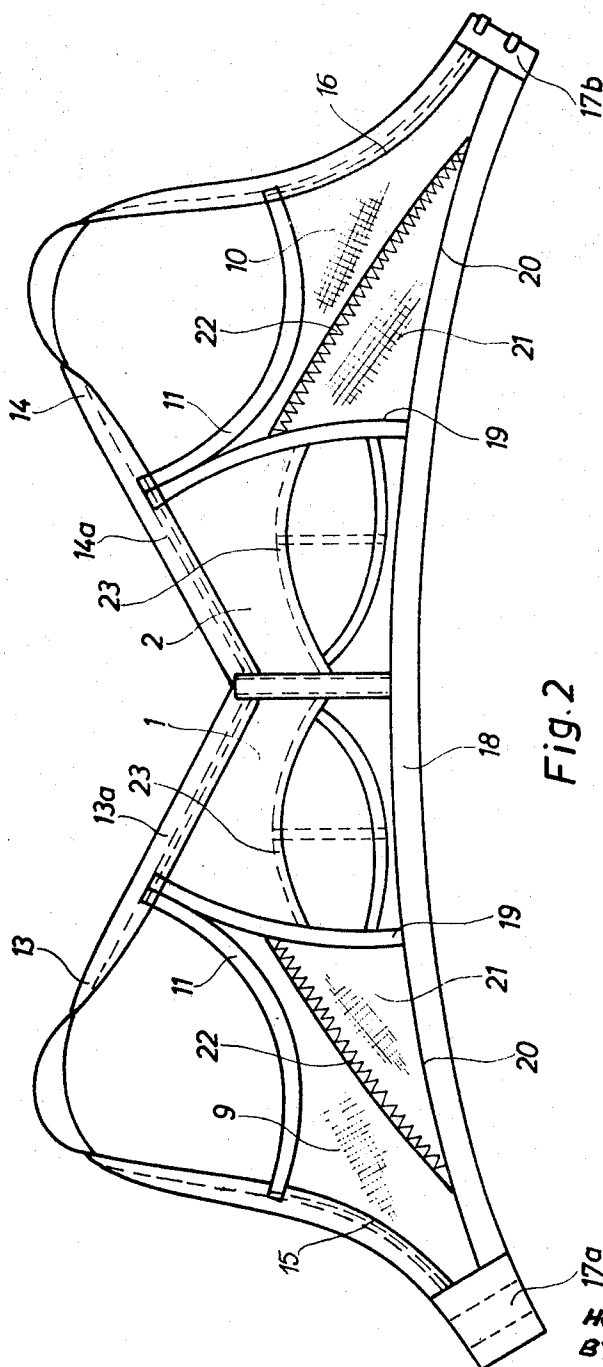
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BRASSIERE

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3 Sheets-Sheet 3

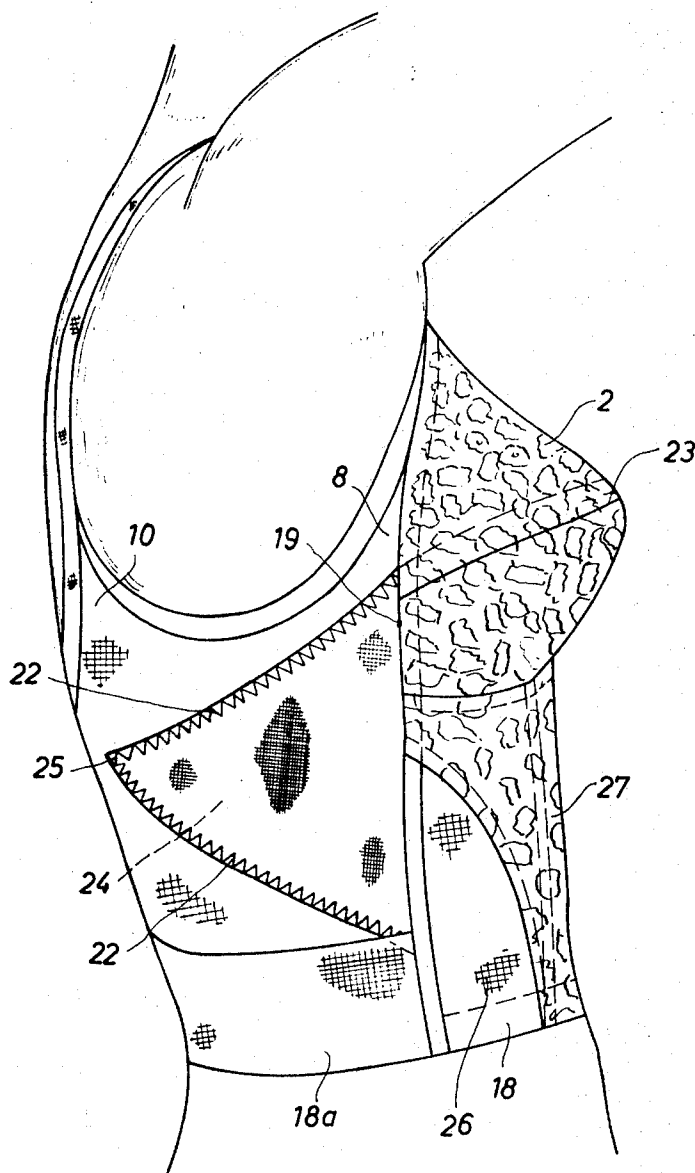


Fig. 3

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3,392,732

BRASSIERE

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Filed Feb. 16, 1966, Ser. No. 527,978

Claims priority, application Germany, Feb. 18, 1965,

T 28,010

10 Claims. (Cl. 128—489)

The present invention relates to brassieres of the general type comprising a pair of substantially inelastic breast supporting forms or cups, constituting a front portion or pair of front portions joined in the center of the brassiere, a pair of at least partially elastic side or back portions connected to the outer ends of said front portions and fitted with fastening means at their extreme rear ends, to provide a body-encircling band or garment, and a pair of elastic shoulder straps connecting the top ends of said cups or front portions with said side portions, to provide a resilient self-adjusting support of the brassiere independent of normal body movements of the wearer.

One of the main problems in the design of brassieres of this type is the transmission to or anchoring upon the back of the brassiere of the tensile forces supporting or upholding the bust by the breast-forming cups of the brassiere. Accordingly, a major consideration to be given in the construction of the brassiere, aside from the design of the front portions or breast cups proper, relates to the joining or functional connection both of the side portions adjoining said front portions, as well as of the shoulder straps connecting the front with the back portions in the manner pointed out. More particularly, the lateral or back portions and the shoulder straps should be designed and interconnected to as little as possible interfere with or impede the free movement of the wearer, on the one hand, and to absorb or transmit the forces involved in such a manner as to maintain or ensure a positive and secure fit of the brassiere at all times, on the other hand. Besides, an attempt should be made both for economic reasons and in following the foregoing aims and requirements, to provide a unit suitable for wear by as great a number or group of persons as possible.

In the past, the use of elastic materials in brassiere design has resulted in providing adequate support and comfort to the wearer. On the other hand, the attempts of ensuring a reliable fit for a larger group of persons have been met with substantial difficulties in practice. Inadequate values of the tensile forces may result in insufficient body support, while too great a force may result both in discomfort to the wearer and distortion of the bust profile. An especially important task, therefore, is the coordination of the various elastic parts or zones of the brassiere, inasmuch as the elastic parts, tending to continuously vary both in form and position, may cause a relative movement between the lateral back portions and the body, the resultant displacement being liable to react upon or otherwise affect the body form or support provided by the brassiere. Still a further problem may arise, for instance, in the case where the back fastening means, such as a hook-eyelet fastener, must be located at a relatively low position, that is, below the breast cups in the case where the brassiere is to be worn in connection with a décolleté garment, to prevent the fastener from slipping into the open neck portion of a garment.

It has been found that brassieres using single-layer intermediate or back portions of elastic material are able to comply to a relatively limited extent only with the requirements set forth in the foregoing. For this reason, brassiere constructions have already become known where-in the side or back portions consist at least in part of overlapping parts or areas such, for instance, a con-

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struction having side portions between the front and back portions of the brassiere composed of two layers shaped to overlap one another in the center, to reduce the elasticity within the overlapping zones or regions, while increasing the freedom of movement of the outer regions. The use of a brassiere of this type is, however, limited to such relatively infrequent uses where the height of the rear ends or fasteners coincides with the overlapping parts, or the breast cups, respectively. Brassieres of this type are accordingly not suited to be worn with open neck (décolleté) garments.

An important object of the present invention is, therefore, the provision of an improved brassiere of the referred to type which will ensure a properly coordinated transmission to or application of the tensile forces, distributed over a length extending along the upper and lateral boundary lines or edges of the inelastic breast cups, upon the back of the brassiere, on the one hand, while being both simple in design and capable of fabrication at reduced cost, on the other hand.

A more specific object of the invention is the attainment of a smooth or gradual transition or connection between the substantially inelastic breast cups and the adjoining elastic side or back portions of the brassiere, to improve or equalize the take-up and transmission of the tensile forces involved as a result of body movements of the wearer.

Another object of the invention is the provision of a brassiere of this type which, while capable of substantially achieving the foregoing aims and objects, is especially suited for wear in connection with low-necked or décolleté dresses or garments.

The invention, both as to the foregoing and ancillary objects, as will become apparent as the description proceeds, will be better understood from the following detailed description of a few preferred embodiments, taken in conjunction with the accompanying drawings forming part of this specification and in which;

FIG. 1 is a front view of a brassiere constructed in accordance with the invention with the side portions shown turned into the plane of the front portion thereof;

FIG. 2 is a view similar to and showing a modification of FIG. 1; and

FIG. 3 is a perspective part side and part rear view of a still further modification of the invention.

Like reference numerals denote like parts in the different views of the drawings.

With the foregoing objects in view, the improvement according to the invention involves essentially the provision, in connection with a brassiere of the general type comprising a pair of inelastic breast-receiving cups forming a front portion, a pair of elastic side panels connected to said cups and terminating in a pair of end or rear portions fitted with suitable fastening means, to provide a body-encircling garment, and a pair of at least partly elastic shoulder straps connected between the top portions of said cups and the end portions of said panels, of means to reduce the elasticity of said panels within substantially triangular areas disposed with one side thereof coinciding with the sides of the adjoining cups and with the remaining sides extending rearwardly along said panels to a point spaced at a predetermined distance from the end portions thereof. As a consequence, there is provided thereby a zone of gradually increasing elasticity starting at the edges of the cups and extending towards the rear of the brassiere which zone, in conjunction with the elastic shoulder straps, provides for a smooth or unimpeded force transmission or application from said cups to the rear of the brassiere, to in turn ensure a perfect fit of the brassiere for a greater number or groups of persons, on the one hand, as well as under varying conditions of body movement on the part of the wearer, on the other hand.

Advantageously, the effect of the triangular areas of reduced elasticity may be achieved simply by the provision of a triangular layer of elastic material overlying and being secured, preferably by stitching, to said side panels, both the latter and the applied layers advantageously having preferred directional elasticities deviating from one another, in the manner described in greater detail hereinafter.

In the case of conventional brassiere styles having the front portion and side panels fitted with a lower body-encircling elastic band, the areas of reduced elasticity are preferably of rectangular-triangular configuration, while with constructions embodying an elastic downward extension of the front portion and side panels of the brassiere, the areas of reduced elasticity are advantageously of equilateral triangular shape, as will become further apparent as the description proceeds in reference to the drawings.

Referring more particularly to FIG. 1, the brassiere shown comprises a front portion embodying a pair of substantially triangular-shaped breast supporting forms or cups 1 and 2 which may be constructed and/or reinforced in a well known manner. Items 3 and 4 are a pair of at least partly elastic shoulder straps connected at their inner ends to the elastic parts of the brassiere represented, in the example shown, by a pair of inserts 5 and 6 disposed between and connected to the inner edges of the cups 1 and 2, said inserts being advantageously in the form of a folded band of elastic material, and by the side portions or panels 7, 8 terminating in back portions 9 and 10, respectively, of the brassiere. The inwardly concave upper edges of the panels 7, 9 and 8, 10 may be reinforced by elastic tapes or bindings 11 starting at the connecting points of the straps 3, 4 and terminating at intermediate points of increased width of the back portions 9 and 10, the rear ends of the straps 3 and 4 being joined to the extreme rear ends 17a, 17b of the parts 9, 10 provided with suitable back fastening means. The straps 3 and 4 may be fitted with suitable adjusting means 12 for the variation of the length thereof, to suit the individual wearer, in a manner well understood. The lower edges of the parts 1, 7, 9 and 2, 8, 10 are advantageously joined to a body-encircling elastic band or strip 18 providing a concave lower contour of the brassiere, whereby to cause the ends 17a, 17b to be located at a substantial distance below the cups 1 and 2, for the purpose as pointed out in the foregoing.

According to an alternative construction of the brassiere according to the invention, as shown by FIG. 2, the shoulder straps 13 and 14 extend along and are secured, by stitching or the like, to the upper straight and inwardly slanting edges of the cups 1 and 2, as shown at 13a and 14a in the drawing. Again, there may be provided reinforcing bindings for the side or back portions 9, 10, in the manner shown by the preceding figure. In other words, in the FIG. 2 embodiment the inner ends of the straps are connected to and extend along the upper straight edges 13a, 14a of the breast cups 1 and 2, terminating at about the front center of the brassiere.

In both embodiments, FIGS. 1 and 2, the rear portions of the shoulder straps extend along the rear edges 15, 16 of the portions 9, 10 and terminate in the ends 17a, 17b fitted with suitable back fastening means, such as a conventional hook and eyelet fastener shown in the drawing.

The side or back portions 9, 10 consist in a known manner of elastic material with the preferred direction of elasticity of the parts preferably coinciding with the direction of a line connecting the center of the outer lateral seams or edges 19 of the cups 1 and 2 with the rear ends 17a, 17b, that is, forming a slightly inclined angle with the lower edge or the strip 20 of the brassiere, as indicated by the double arrow *a* in the drawing.

Disposed between the lateral seams or edges 19 of the cups 1 and 2 and the lower edge or strip 20 of the brassiere of both FIGS. 1 and 2, and overlying the portions

7, 9 and 8, 10, respectively, are a pair of reinforcing parts or sections 21 also of elastic material. In the example shown, the sections 21 are of substantially rectangular triangular configuration with the shorter side of the triangles coinciding with and being stitched to the seams 19, with the longer sides of the triangles stitched to the strip 20, and with the hypotenuse of the triangles extending from a point somewhat above the ends of the intermediate cross-seams 23 of the cups 1 and 2 to a point on the edge or strip 19 somewhat beyond the center of the back portions 9, 10. The reinforcing parts, being furthermore connected, by stitching or the like, to the parts 9 and 10 along the hypotenuse as at 22, advantageously have a directional elasticity including a somewhat greater angle, in respect to the strip 20, compared with the direction of elasticity of the panels 9 and 10 which they overlie, as indicated by the arrow *b* in the drawing. The hypotenuse of the reinforcing triangle is preferably connected to the underlying parts by a zigzag seam 22. As will be understood, the size and/or shape of the reinforcing triangles 21 may be varied and the most favorable configuration determined by experiment, to suit varying brassiere designs and styles.

The elastic parts or inserts adjoining the inner upper edges of the breast cups 1 and 2, that is, the parts 5, 6, FIG. 1, and the end portions 13a, 14a of the straps 13, 14 FIG. 2, advantageously have a direction of elasticity substantially coinciding with the edges of the cups, in the interest to afford a coordination or smooth transmission of the tensile forces from said parts to the rear of the brassiere via the shoulder straps 3, 4 and 13, 14, respectively.

There is thus provided by the reinforcing sections 21 overlying the portions 7, 9 and 8, 10 a connection or coupling between the substantially inelastic breast cups 1 and 2 and the elastic back portions 9, 10 of graduated elasticity, the latter being lowest near the edges 19 of the cups and increasing progressively in the rearward direction and merging into the elasticity of the portions 9, 10 by virtue of the decreasing width of or the triangular configuration of the sections 21. This will result in a positive and firm bust support substantially independent of body movements, on the one hand, and in a ready and effective force transmission or application from the cups upon the back portions of brassiere ends 17a, 17b, on the other hand. In other words, the invention is predicated on a relatively smooth transition or graduated elastic connection extending along a finite coupling zone or area between the front (breast cups) and back portions of the brassiere, as compared with the more or less abrupt change or transition from the relatively inelastic cups and the elastic side panels or back portions in the case of a conventional brassiere construction.

As is understood, a graduated elasticity of the sections or areas 21 may also be achieved by the provision of a composite single-layer construction of the parts 7, 9, 21 and 8, 10, 21 with the triangular areas according to 21 consisting of inserts or section of material of greater elasticity compared with the elasticity of the areas of 7, 9 and 8, 10, respectively, in manner readily understood.

FIG. 3 shows a side view of a further embodiment of the invention relating to a brassiere of the type fitted with an inelastic depending front extension, commonly known as "Longline" brassiere. In this case, the reinforcing layers 24, or the equivalents thereof, take the form of an equilateral triangle with its base secured to the downwardly extended seams 19 of the cups 1 and 2 and with its point extending into the rear part of the brassiere in the manner shown and understood from the foregoing. In this case the resultant free side edges of the triangle are again advantageously connected through zig zag seams or stitches 22. Alternatively, the reinforcing sections 24 may be replaced by triangular inserts or greater elasticity compared with the remaining areas of the panels, in the manner described in reference to the preceding figures.

In an effort to further improve the freedom of movement of the wearer of a "Longline" brassiere according to FIG. 3, the part 27 below the front portion or breast cups 1 and 2 may be fitted near the rear adjoining the edge seams 19 with triangular elastic inserts 26 and, in order to furthermore improve the body forming effect of the brassiere, the rear portions 18a of the strip 18 may be provided with a width greater than the front part, in the manner shown.

There is thus provided by the invention an improved brassiere wherein the tensile forces involved in the forming and supporting of the breasts and to be taken up by the upper and lateral edges of the substantially inelastic breast cups are distributed and guided in such a manner as to enable a brassiere of given style or size to ensure a perfect fit for a relatively large number or groups of persons. This effect and result is achieved by the invention in a most simple manner by the action of the triangular reinforcements or areas of reduced elasticity between the cups and the rear portions of the brassiere.

In the foregoing the invention has been described in reference to a few specific illustrative examples of embodiments. It will be evident, however, that variations and modifications, as well as the substitution of equivalent parts or elements for those shown for illustration, may be made without departing from the broader scope and spirit of the invention, as set forth in the appended claims. The specification and drawings are accordingly to be regarded in an illustrative rather than in a restrictive sense.

#### I claim:

1. In a brassiere of the type described comprising in combination:

- (1) a pair of substantially inelastic breast-receiving cups joined to provide a front portion of the brassiere,
- (2) a pair of elastic side panels each having one end of relatively large width connected to the outer lateral edge of one of said cups and terminating in a rear portion of relatively smaller width, to form a body-encircling garment,
- (3) a pair of at least partly elastic shoulder straps each connected between a point of the top portions of one of said cups and the rear portion of the adjoining side panel, and
- (4) means to reduce the elasticity of said panels within a substantially triangular area, compared with the elasticity of the remaining area of the panels, said area of reduced elasticity being provided by a triangular-shaped layer of elastic material overlying each panel and having its edges stitched to thereto and to the edges of an adjoining cup, said triangular-shaped layer having one side of relatively short width coinciding with the lateral edge of the adjoining cup and with the remaining sides of the triangle extending rearwardly along the respective panel to a point spaced by a predetermined distance from the rear portion thereof.

2. In a brassiere as claimed in claim 1, including a common elastic body-encircling band interconnecting the lower edges of said front portion and said panels, said cups having a substantially triangular configuration with the base of the triangle coinciding with said band, with the outer sides of the triangles connected to said side panels, and with the ends of said straps connected to the top portions of the respective cups.

3. In a brassiere as claimed in claim 1, said front portion and side panels fitted with substantially inelastic downward extensions, and each said areas of reduced elasticity being in the form of an equilateral triangle having a base coinciding with the lateral edge of the adjoining

ing cups and extending with its point in the rearward direction substantially centrally of said panels.

4. In a brassiere as claimed in claim 1, said areas of reduced elasticity provided by triangular-shaped elastic layers overlying and secured to said panels.

5. In a brassiere as claimed in claim 1, said front portion including an elastic insert connecting at least the upper portions of said cups, and the ends of said straps connected to said insert.

6. In a brassiere as claimed in claim 5, said insert having a direction of elasticity at least in the vicinity of and conforming to the edges of said cups.

7. In a brassiere as claimed in claim 1, said front portion having a pair of inwardly and downwardly slanting edges forming the upper contours of said cups, and the end portions of said straps extending along and secured to said edges.

8. In a brassiere of the type described comprising in combination:

- (1) a pair of substantially inelastic substantially triangular-shaped breast-receiving cups,
- (2) an elastic insert joining at least the upper portions of said cups, to provide a front portion of the brassiere,
- (3) a pair of elastic side panels each having an end of relatively large width connected to one of the outer sides of said cups and terminating in rear portions of relatively smaller width fitted with fastening means, to provide a body-encircling garment,
- (4) a pair of at least partly elastic shoulder straps each connected between a point of said insert adjoining the top of one of said cups and the rear portion of the adjoining panel,
- (5) a common body-encircling elastic band interconnecting the lower edges of said cups and said panels, and
- (6) means to reduce the elasticity of said panels within a substantially triangular area, compared with the elasticity of the remaining area thereof, said area of reduced elasticity being provided by a triangular-shaped layer of elastic material overlying each panel and having its edges stitched thereto and to the edges of adjoining cup, said triangular shaped layer having a relatively small side coinciding with the side of the adjoining cup and with the remaining sides of the triangle extending rearwardly along the respective panel to a point spaced by a predetermined distance from the rear portion thereof.

9. In a brassiere as claimed in claim 8, the direction of elasticity of said layers forming an angle with said band greater than the angle formed therewith by the direction of elasticity of said panels.

10. In a brassiere as claimed in claim 8, said front portion and said panels fitted with substantially inelastic downward extensions, and the areas of reduced elasticity of said panels being in the form of an equilateral triangle having a base coinciding with a side of the adjoining cups and extending with their points in the rearward direction substantially centrally of said panels.

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