

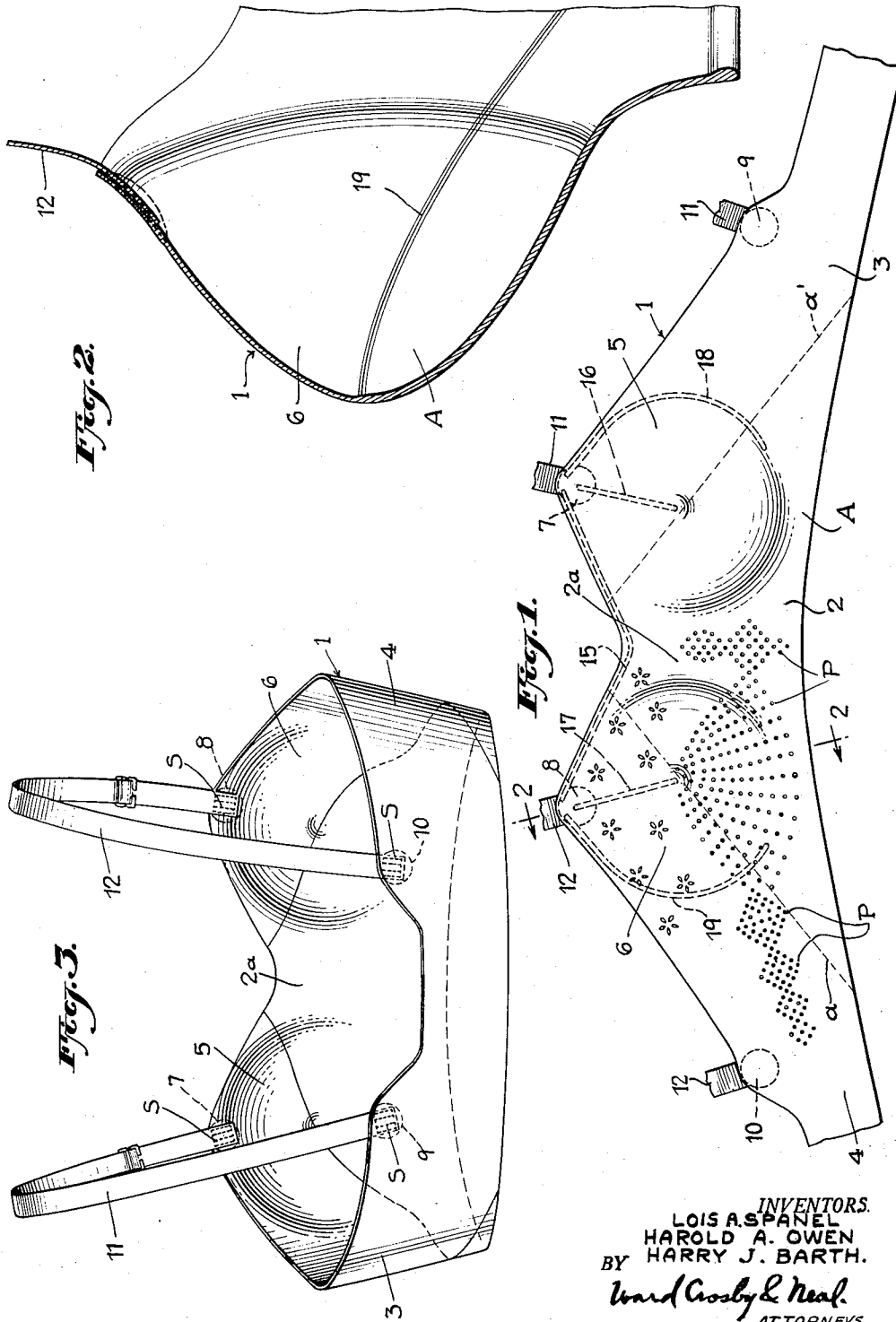
July 2, 1957

L. A. SPANEL ET AL
PREFORMED LATEX BRASSIERE

2,797,415

Filed Aug. 9, 1952

3 Sheets-Sheet 1



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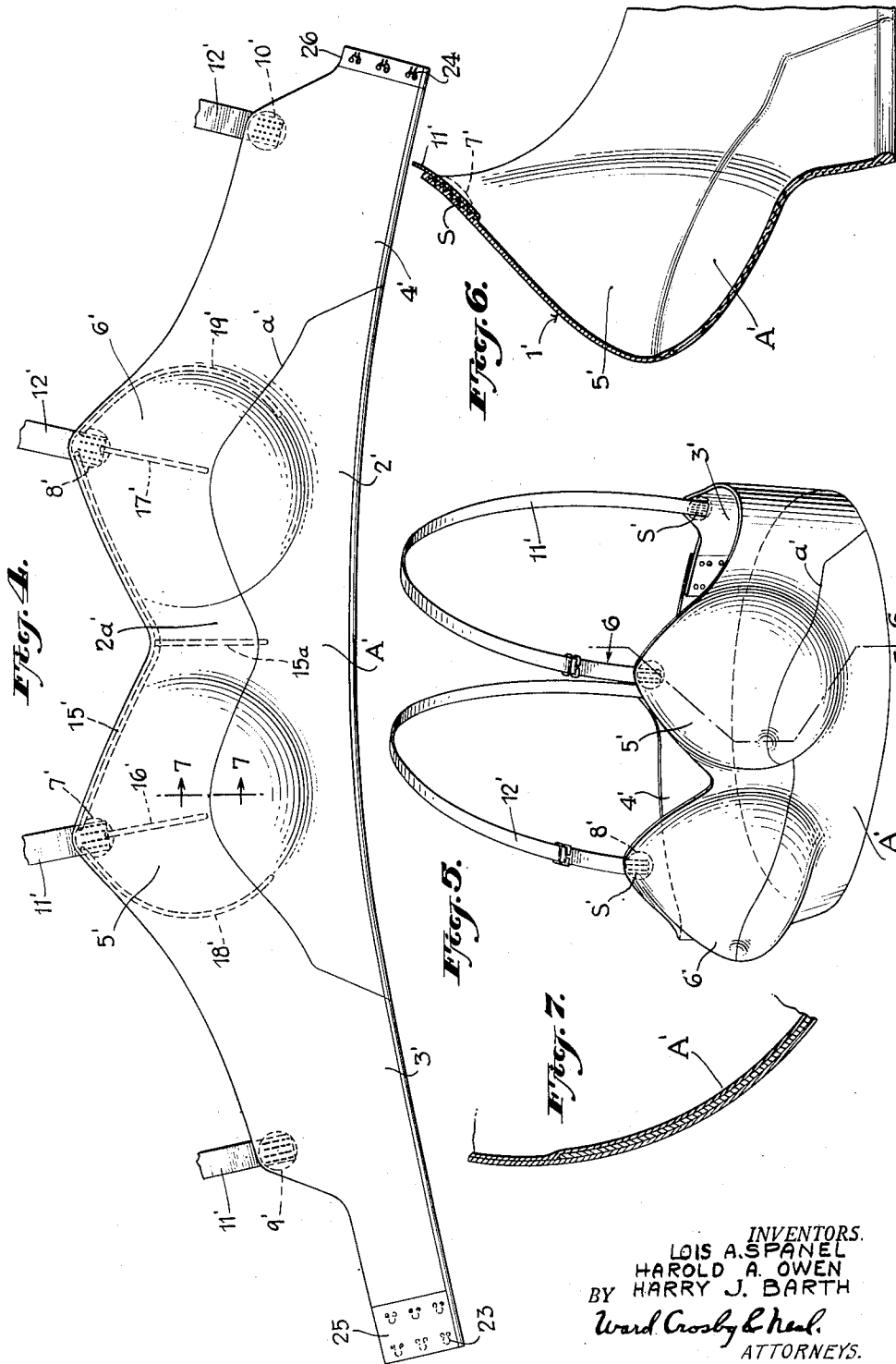
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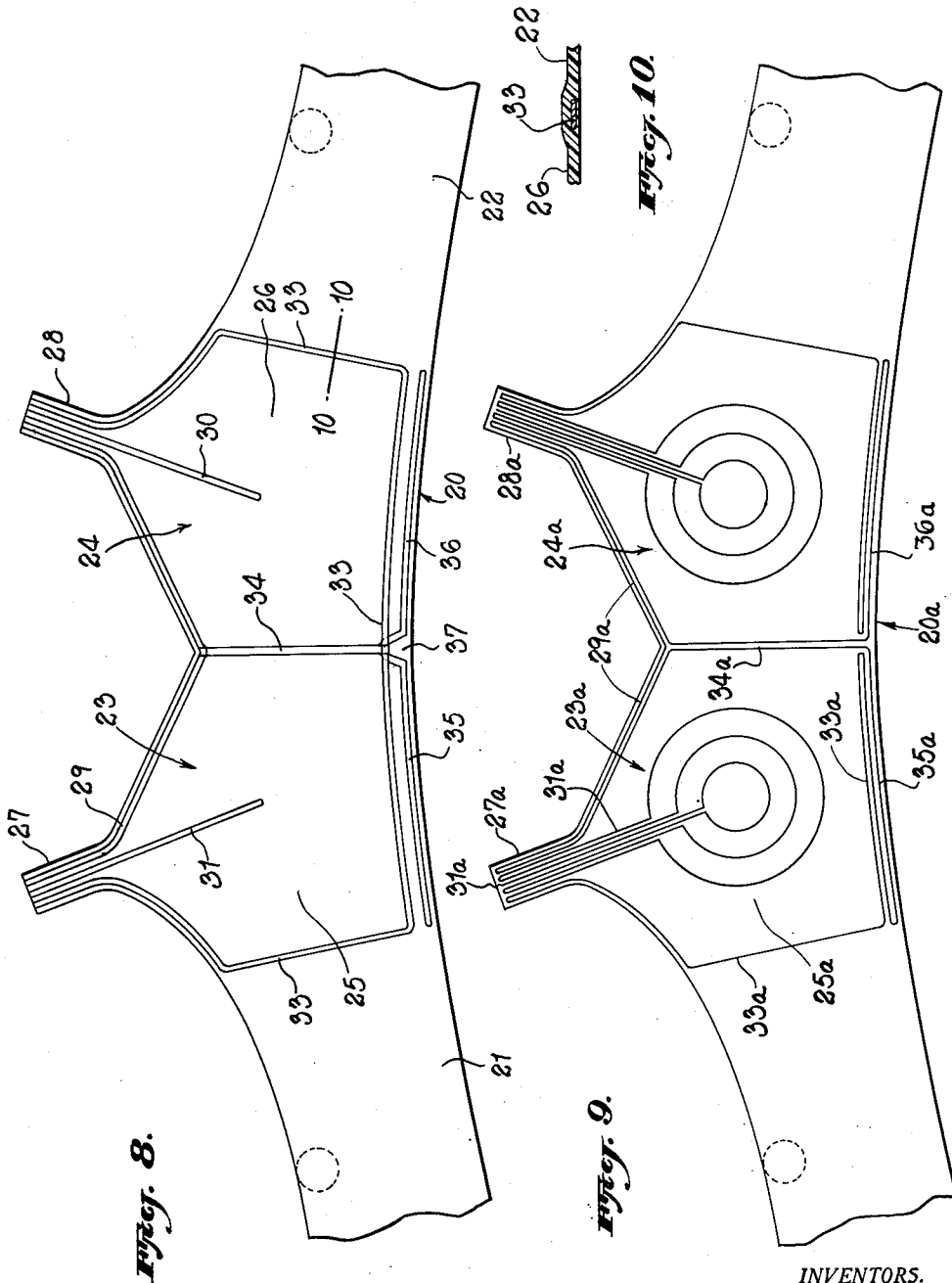
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PREFORMED LATEX BRASSIERE

Lois A. Spanel, New York, N. Y., and Harold A. Owen and Harry J. Barth, Dover, Del., assignors to International Latex Corporation, Dover, Del., a corporation of Delaware

Application August 9, 1952, Serial No. 303,501

10 Claims. (Cl. 2—42)

This invention relates to brassieres. While many of the functional requirements of brassieres have long been known, the structure for meeting these requirements is complex and has resulted in compromise in many respects. Hence it has been and is common in the different forms and types of brassieres to make a mosaic garment of pieces of greatly varying characteristics.

We found that an ideal material for use in a brassiere is deposited rubber latex. The using public finds deposited latex suitable for other articles of wearing apparel because it is freer from soil, more elastic, easier to wash for immediate re-use, and less expensive for performance than if made by other methods and of other materials. We ascertained, however, that despite the foregoing advantages, a deposited latex brassiere which elastically embraces the body, presents certain problems including girthwise movement of the flesh with an accompanying displeasing deformation of the breasts and accentuation of the normal movement thereof.

An important object of our invention therefore is to provide a deposited latex brassiere having means for upholding the breasts in desired position.

A further object consists in providing a deposited latex brassiere provided with means for controlling the normal movement of the breasts.

Another object is to provide a brassiere having at least its front panel and cups preformed of latex and of a relatively thin wall.

Another object consists in providing a seamless rubber latex deposited brassiere having areas conforming to the diverse requirements.

Another object consists in providing a rubber latex deposited brassiere wherein the areas of diverse requirements may be provided in the dipping process.

A further object is to provide a brassiere having the desirable functional requirements while free of the undesirable features referred to above.

Other and further objects and advantages of the invention will more clearly appear from the detailed description given below taken in connection with the accompanying drawings which form a part of the specification and in which:

Fig. 1 is a front elevational view of a brassiere, with certain parts broken away, showing an embodiment of our invention, with the rear portions folded out into the plane of the front panel;

Fig. 2 is an enlarged cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a rear perspective view of the brassiere shown in Figs. 1 and 2 in substantially the position when worn;

Fig. 4 is a rear elevational view of a brassiere, with certain parts broken away, showing a further embodiment of our invention, with the rear body portions folded out into the plane of the front panel;

Fig. 5 is a front perspective view of the modified form shown in Fig. 4 in substantially the position when worn;

Fig. 6 is an enlarged cross-sectional view taken on line 6—6 of Fig. 5;

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Fig. 7 is an enlarged cross-sectional view taken on line 7—7 of Fig. 4;

Fig. 8 is a front elevational view of a brassiere with certain parts broken away, showing somewhat diagrammatically a further embodiment of our invention;

Fig. 9 is a similar view of a still another embodiment; and

Fig. 10 is a partial cross-sectional view taken on the plane 10—10 of Fig. 8.

Referring more particularly to Fig. 1, the brassiere body, designated in general as 1, is made of a film of deposited latex and comprises a wall or body panel consisting of a front panel zone 2 and laterally extending portions 3 and 4 which extend around opposite sides and, in this embodiment, are continuous across the back to provide in conjunction with said front panel 2 the girthwise extent of the brassiere. The front panel 2 is provided with breast cups 5 and 6 contoured to the desired size and shape. The cups 5 and 6 are spaced apart laterally in the usual position with a median panel zone 2a therebetween. The cups in the present embodiment substantially merge into the upper edge of the front panel 2 and are spaced upwardly from the lower edge.

Except as otherwise referred to hereinafter, the wall is of such a character and thickness as to be easily stretchable.

An area designated in general as A is substantially more resistant to deformation than the remaining area of the latex film, while still being readily pliable. In the preferred embodiment this area comprises an extra layer of latex having a higher modulus of elasticity than that constituting the other portions of the body. Thus we prevent the total latex wall thickness in area A from becoming objectionably thick. In effect, the body area A is modified to provide a wall zone of greater modulus of elasticity so that in this area it is reinforced against deformation to provide resistance against unwanted distortion. The area A (Figs. 1 and 2) commences at the lower edge of the brassiere body and extends laterally along this edge across the front zone 2 and slightly beyond. From its lower edge the area A gradually decreases in lateral extent and its oppositely disposed sides are indicated by the respective lines a and a' which are spaced apart at their points of intersection with the upper edge of the body. It has been found desirable to have the outer marginal edges, such as a—a', of the area A, pass inside or at about the apexes of the cups 5 and 6 so as to include only a portion of the cup areas.

It will thus be seen that the area A comprises the following zones: the panel zone beneath the cups 5 and 6 for the full lateral extent of the front panel 2, but less than the girthwise extent of the girdle; the lower segments of the cups 5 and 6; and the median zone 2a. The upper segments of the cups 5 and 6 and oppositely disposed adjoining areas of the body panel lie without the area A and are the portions of lower modulus above referred to and in general are more stretchable.

From the foregoing it will be understood that we have provided a latex brassiere body in which the preformed cups are provided with lower portions of such character as to support the breasts (Fig. 3), while the upper cup portions are of sufficiently low modulus to yield due to the uplift resulting from the lower supports and thus providing for excellent conformity. Likewise the distorting pulling apart of the breasts is prevented by the fact that the stretchability of the body is inhibited in the zone 2a connecting the cups—in the present embodiment for the full vertical distance of the panel. The ready elasticity of the rear panel portions 3 and 4 provides sufficient stretch to cover a wide range of body circumferences.

While our brassiere may be wholly manufactured of rubber latex, we prefer to reinforce zones 7 and 8 on the front, such as by fabric patches inserted in the latex body, in substantial alignment with the centers of respective cups 5 and 6; and provide similar reinforced zones 9 and 10 at correspondingly opposite points on the rear. Shoulder straps, such as 11 and 12, preferably of material relatively non-stretchable compared to the unrestricted latex, are secured, as by stitches S, to the respective zones 7-9 and 8-10.

The brassiere body 1 is provided with perforations, such as P, arranged in any suitable manner, as for example shown on the left hand side of Fig. 1, it being understood that the perforations are identical on the opposite side of the center line but have been omitted therefrom for convenience.

For brassiere sizes intended for large or pendulous breasts we have found that substantial elasticity of the upper cup areas is especially advantageous to permit easy stretchability as to said areas; but because of the increased strain a relatively thin latex film is subject to undue stresses. We have devised a way to provide the desired stretch in said areas, while providing means to carry the stresses without objectionable interference with desired stretch. This is accomplished by reinforcing said body in the manner now to be described.

Along the upper margin closely following the edge we imbed in the latex a narrow strip of fibrous material 15. We prefer to use for this purpose a relatively thin nylon tape and have found a tape of the width of about $\frac{1}{8}$ " to be satisfactory. This tape is preferably somewhat stretchable so as to permit a limited give with the stretch of the much more stretchable latex while preventing the full stretch of the latex. The tape has its opposite ends anchored to the shoulder straps attachment zones 7 and 8. Likewise, similar strips 16 and 17 are disposed in the cup areas in general alignment with the shoulder straps 11 and 12. The upper ends of the strips 16 and 17 are anchored to the respective patches 7 and 8, as by overlapping the same, and extend downwardly over the upper segments of the cups 5 and 6 to about the apex zone and preferably do not extend therebeyond. To insure better conformation and symmetry we prefer to also utilize similar strips 18 and 19 which extend in arcuate paths along the outer bases of respective cups 5 and 6. The upper ends of said strips are anchored to the respective zones 7 and 8 and their lower ends overlap the area A so as to carry the stresses from the upper marginal edge to the more-resistant-to-stretch area A and assist in assuring better contour conformation. While we presently prefer to use tape to provide these strips we have also used a plurality of threads in substantially parallel closely spaced relation, and other forms of reinforcing these narrow zones may be utilized. It is obvious that instead of using separate tapes or other strips two or more of these may be made continuous and if desired the patches at zones 7 and 8 may be made integral with one or more of said strips.

The latex body is preferably deposited by dipping. In its preferred form the brassiere body is deposited by an over-all coat or coats of relatively low modulus of elasticity latex to less than the desired thickness, and one or more additional layers, preferably of a higher modulus of elasticity latex, are deposited in area A only, and a final over-all deposit brings the body to the desired wall thickness. The reinforcing patches and strips are preferably imbedded in the garment wall.

The latex body above described may be economically and easily produced in mass production by apparatus and method described and claimed in the copending application of Harry J. Barth, Serial No. 303,502, filed on even date herewith, for "The Art of Making Preformed Deposited Brassieres," now Patent No. 2,721,323.

The following example is illustrative of one suitable

manner in which the brassiere bodies of this invention may be made:

Using a suitable form (for example, such as one disclosed in said application Serial No. 303,502)

First: dip said form into or otherwise deposit on the over-all form generating surface a film of latex to provide any suitable wall thickness of, say about .003". A latex compound for this purpose may be one such as is in current use for making deposited latex articles; but we use latex of the character described in Harry J. Barth application Serial No. 303,502, filed on even date herewith.

Second: apply the reinforcing members in the desired position on the coated brassiere generating surface of the form.

Third: dip or otherwise deposit on the area A only a relatively high modulus latex to a combined thickness of, say about .013".

Fourth: dip or otherwise deposit over-all a layer of latex, preferably such as used in the first step supra, to provide an over-all gauge of the desired thickness, e. g., about .025" for the area A and .015" for the remainder.

The following formula is given by way of example of a suitable high modulus latex compound:

	Pts. dry weight
Centrifugal latex	100
"Kralac" ¹ latex	25
Potassium hydroxide	0.5
Sulfur	1.0
Zinc oxide	1.0
Tetramethyl thiuram disulfide	1.0

¹A trade name (of Naugatuck Chemical Co.) for high styrene synthetic latex comprising about 85% styrene and 15% butadiene. Another high styrene synthetic latex of similar properties is sold under the trade name of "Pliolite" (Goodyear Tire & Rubber Company).

The potassium hydroxide is added in about 20% water solution and the sulfur, zinc oxide, and tetramethyl thiuram disulfide are added in conventional water dispersions known in the art.

It should be understood that other methods of preparing a high modulus film can be used, such as the incorporation of about 20 pts. colloidal silica (e. g., "Ludox" as marketed by the du Pont Company), or 15 pts. of a suitable water compatible formaldehyde resin such as urea formaldehyde in the place of the "Kralac" latex given in the formula above.

It will be understood by those skilled in the art that the procedure and thicknesses may be varied within the teachings of this invention. For example, the brassiere wall thickness should be made as thin as possible, consonant with the functional requirements. In the smallest size where such requirements are of a minimum, a wall thickness of about 0.012" may be used whereas in the larger sizes a desirable wall thickness might extend to 0.018" or more. In the smaller sizes the area A containing the higher modulus material may have a total thickness, including the lower modulus latex, of about 0.017" whereas in the largest size the total thickness requirement might extend to 0.043". These dimensions are exclusive of any lining added thereto. Further factors that bear on the latex wall thickness are its tear resistance and the ability to withstand deleterious secretions of the upper portion of the female body as is taught in the copending application of Harry J. Barth entitled "Deposited Latex Brassieres." Additionally the fabric reinforcements may be applied at any time in the above described process. The deposits may be by way of repeated dips of small increments of thickness or a relatively thicker deposit may be made by the use of a suitable coagulant if desired.

Modification

In Figs. 4, 5, 6 and 7 we have shown a modified form of brassiere as illustrative of another embodiment of the invention. Since this embodiment is in many respects identical with that above described, it will not be necessary

to describe in detail such identical features and in order to facilitate an understanding of this modification the same numerals with the prime suffix added have been applied to the corresponding parts. Except as otherwise hereinafter pointed out the arrangement and construction of parts is the same as that previously described with reference to the embodiment shown in Figs. 1-3, inclusive.

In Fig. 4 the brassiere is seen from the inside, instead of from the outside as in Fig. 2; and in Fig. 5 the brassiere is shown in front perspective instead of the rear perspective as in Fig. 1. As will be seen from Figs. 4 and 5, the brassiere body of this embodiment is discontinuous girthwise and the rear panel portions 3' and 4' are provided at their respective ends with cooperating fastening means, such as the eyes 23 and hooks 24, which are shown secured to reinforced portions 25 and 26 on their respective ends. The only other substantial difference between this modification and that heretofore described resides in the somewhat different shape and disposition of the area A' in this embodiment as compared to the corresponding area of the embodiment shown in Figs. 1-3. As in the previous embodiment this area A' extends from the lower edge of the brassiere body throughout the full width of the front panel 2' and extends a short distance into the respectively opposite panel portions 3' and 4'. As in the previous embodiment this area also diminishes in its lateral extent toward the upper edge of the body and spans the median zone 2a' of the front panel, but only for a part of its vertical extent upwardly from the lower edge. In this embodiment the area A' includes lower segments of the cups 5' and 6' and terminates below the apexes of the cups. At the median zone the area A' is spaced downwardly a substantial distance below the upper edge of the front panel and therefore leaves certain select areas of this panel uninhibited as to stretch as compared to the latex wall within area A'. A stretch inhibiting strip, such as 15a may be added in this modification, extending from the strip 15', which it overlays, to the upper margin of the area A', which it also slightly overlaps to obtain a more definite separation and support. From this it will be seen that the beneficial results of the invention previously described with respect to support, conformity and the prevention of the distorting pulling apart of the breasts also are provided for the embodiment of Figs. 4-7.

It is noted that in every embodiment of the invention herein illustrated the brassieres are shown in the reverse position from that deposited on the forms, i. e., in each embodiment the exterior surface of the brassiere corresponds to the interior surface as deposited on the form. The brassieres are thus shown because in the preferred embodiment we prefer to provide a flock coating on the inner surface which is to lie next to the body of the wearer and this coating is applied in accordance with the invention of Harry J. Barth as described and claimed in currently filed application Serial No. 303,502, filed Aug. 9, 1952 for "Latex Brassiere with a Lining of Fibers."

It will be noted (Figs. 3 and 5) that the shoulder straps such as 11 and 12 and 11' and 12' have their ends disposed against the interior surface of the brassiere wall. As above explained, the patches, such as 7, 8, 9 and 10 (Fig. 1) and 7', 8', 9' and 10' (Fig. 4) are imbedded in that portion of the wall lying nearest the face of the form and therefore the patches in this example are disposed adjacent the outer surface of the wall. This means that the latex wall at the points of attachment is confined substantially entirely between the fabric patches and the ends of the straps secured thereto by the stitches, such as S. This assures that the latex wall is protected against substantial cutting by the stitches and this mode of attachment resists tearing or ripping.

In general a significant feature of our invention is the provision of a seamless preformed brassiere body formed of latex which may be either continuous (Fig. 3) or discontinuous (Figs. 4 and 5) in a girthwise direction and in which the latex wall is so formed as to provide stretch-

inhibited areas while maintaining other more easily stretchable areas. Brassieres made in accordance with this invention are non-binding and are exceptionally comfortable; and furnish that support and conformation which is essential to satisfactory performance. Elasticity is present where needed and support and firmness are provided where necessary.

For example, we have found that while a firm support is necessary in the lower area of the cups it is desirable that this area have some elasticity; and that relatively thin easily stretchable areas be provided in the upper area of the cups in order to provide desired conformity.

The term "latex" is used herein in its broad sense and is intended to comprehend natural rubber latex, synthetic rubber latex, or latices or dispersions of any rubber-like material, or a combination of two or more of the same with or without suitable additional ingredients known in this art.

While the invention in its presently preferred form provides a unitary seamless body for the entire girthwise extent (as in the continuous type, Fig. 3) or for substantially the entire girthwise extent (as in the discontinuous type, Figs. 4 and 5), certain features of the invention may be usefully embodied in a brassiere in which only the front breast portions including the cups, is of a seamless preformed character.

Further modifications

In Fig. 8 we have illustrated somewhat diagrammatically a rubber latex deposited body comprising a front panel 20 and laterally extending connecting side portions 21 and 22. The front panel contains the breast portions 23 and 24 in each of which a cup, numbered 25 and 26 respectively, is preformed.

The particular brassiere illustrated is additionally provided with shoulder tabs 27 and 28 to which the supporting shoulder straps, not shown, are attached by suitable fastening means.

In this modification useful for women with breasts not inclined to be heavy, control of the latex is obtained by a relatively narrow and thin tape embedded in the latex body, as shown in Fig. 10 and in the manner described of tape 15 of Fig. 1.

Specifically, a tape numbered 29 extends from the edge of the shoulder tab 27 marginally across the top of the breast sections 23 and 24 to the remaining shoulder tab 28. Tapes 30 and 31 extend from the shoulder tabs towards the vicinity of the center of each breast cup. Outside tapes 33 extend laterally from the one shoulder tab to the other, encircling the sides and bottom of the breast cups, crossing the entire panel. The upper tape 29 is connected to the lower tape 33 centrally between breast cups by tape 34. The panel structure is completed by lower marginal tapes 35 and 36 which extend girthwise in the lower marginal portions, and connect with the breast defining tape 33 at the center region forming a V-shaped elastic area 37 free of inhibiting tape at the lower central marginal portion which we find gives added conformation of the brassiere to the body.

In Fig. 9 we have illustrated a brassiere 20a in which the latex is controlled by a thread which may be started at the shoulder tab 27a, and extends downwardly towards the center of cup 25a, encircling the breast concentrically three times forming cup connections 31a. The thread may continue from the shoulder tab to form breast cup encircling connection 33a, margin reinforcement 35a, central marginal connection 34a, and back to the tab 27a to start connection 29a. This latter connection extends across from one breast section 23a to breast section 24a where the thread is continued in the same manner as previously described.

From the foregoing it is apparent that we have provided a deposited latex brassiere in which the natural elasticity of the latex beneficially employed to elastically embrace the body and giving sufficiently to accommodate

the moving body, is provided with means for preventing any unpleasing deformation of the breasts, while supporting them. The natural elasticity of the latex is additionally controlled to prevent accentuation of the normal movement of the breasts.

Control of the natural elasticity of the latex where employed, is obtained by a wide variety of means. Such control is obtained without loss of the beneficial values inherent in employing a film forming elastic material.

We have thus made possible a seamless brassiere possessing a natural elasticity for embracing the body and which supports the breasts without flattening them.

While the invention has been described herein with reference to several embodiments, it will be appreciated by those skilled in the art that other modifications may be made without departing from the spirit of the invention or scope of the appended claims. Also, it will be understood that the drawings appended hereto are for purposes of illustration only and that dimensions therein shown are merely for purposes of illustration, and not necessarily the actual dimensions employed in practice.

What we claim is:

1. A brassiere comprising back and breast portions, and means for causing a girthwise tension in the breast portions, said breast portions made of a readily collapsible, relatively thin plastic wall of deposited latex material to elastically embrace and conform to the body, said breast portions each comprising an outwardly extending preformed cup to accommodate the breast, and being provided with soft pliable stretch inhibiting material unitarily formed to the thin elastic wall of the breast portions and positioned in the region between the centerlines of the cups, and below the line joining the centers of the cups for resisting lateral separation of the breasts due to the elasticity of the pliable latex of the breast portions when the girthwise tension is produced in the breast portions.

2. A unitary preformed dipped latex brassiere, comprising a body panel having an upper edge and a lower edge, said body panel having a front zone provided with breast cups and oppositely disposed extensions, said body panel having a continuous area forming a unitary structure with the panel resistant to deformation extending laterally for the full width of said front zone along the lower edge including substantially the full height of the body panel below said cups and gradually decreasing in its lateral extent progressively from said lower edge toward the upper edge of the body panel, the remainder and major areas of said cups and body panel being relatively elastic.

3. A unitary preformed brassiere, comprising a front panel provided with breast cups, laterally extending side portions which are adapted to extend around opposite sides and over the back of the wearer, a substantial part of the upper portions of said cups and the major portion of the laterally extending side portions being elastic and the lower portion of said front panel throughout a continuous area including its marginal edge and the lower portions of said cups forming a unitary structure with the panel being substantially less elastic, said brassiere having reinforced zones of attachment for the front ends of shoulder straps disposed at the upper edge of the front panel in respective alignment with the centers of said cups, stretch inhibiting strips extending downwardly from said zones of attachment substantially centrally of respective cups and terminating contiguous the upper edge of said area of lesser elasticity, and a stretch inhibiting strip disposed along the marginal upper edge of said body panel and interconnecting said zones of attachment.

4. A unitary preformed brassiere, comprising a front panel provided with breast cups, laterally extending side portions which are adapted to extend around opposite sides and over the back of the wearer, a substantial part

of the upper portions of said cups and the major portion of the laterally extending side portions being elastic and the lower portion of said front panel throughout a continuous area including its marginal edge and the lower portions of said cups being substantially less elastic, shoulder straps fastened to front points of attachment at an upper edge of the front panel in respective alignment with the centers of said cups and fastened to said corresponding laterally extending side portions, stretch inhibiting strips extending from said front points of attachment downwardly in a direction toward respective cups and terminating approximately at the central cup zones, stretch inhibiting strips extending from said points of attachment along respective arcuate paths closely adjacent the base of the outer sides of said cups with their lower ends overlapping said area of lesser elasticity, and a stretch inhibiting strip extending along the upper margins of said brassiere with its opposite ends disposed at said front points of attachment, said strips being imbedded in said latex, said substantially less elastic area and stretch inhibiting strips forming a unitary structure with the panel.

5. A unitary preformed latex brassiere, comprising a front panel provided with breast cups having apexes, and laterally extending side portions which are adapted to extend around opposite sides and over the back of the wearer, said brassiere having reinforced zones of attachment for the front ends of shoulder straps disposed at the upper edge of the front panel in respective alignment with the centers of said cups, relatively narrow stretch inhibiting zones extending downwardly from said zones of attachment substantially centrally of respective cups and terminating contiguous their apexes, and a relatively narrow stretch inhibiting zone disposed along the marginal upper edge of said body panel and interconnecting said zones of attachment, said stretch inhibiting zones forming a unitary structure with the panel.

6. A brassiere in accordance with claim 1 wherein the stretch inhibiting material includes a portion of the upper margin of the breast portions between the cups.

7. A brassiere in accordance with claim 1 wherein the stretch inhibiting material includes a portion which extends from the upper margin of the breast portions and outwardly encircles each of the breast cups at the periphery thereof to a point below the center of the cup.

8. A brassiere in accordance with claim 1 wherein the stretch inhibiting material includes a portion which extends from the upper margin of the breast portions towards the center of each cup.

9. A unitary preformed latex brassiere, comprising a front panel provided with breast cups, and laterally extending side portions which are adapted to extend around opposite sides and over the back of the wearer, upper portions of said cups and contiguous oppositely disposed front panel areas and respectively adjacent side portions being generally elastic, lower portions of said cups being reinforced against stretch by means forming a unitary structure with the panel, shoulder straps fastened to points of attachment at an upper edge of the front panel in respective alignment with the centers of said cups and to said corresponding laterally extending side portions, stretch inhibiting strips extending from said front points of attachment downwardly in a direction toward respective cups and terminating approximately at the central cup zones, stretch inhibiting strips extending from said points of attachment along respective arcuate paths closely adjacent the base of the outer sides of said cups with their lower ends overlapping said reinforced lower segments, and a stretch inhibiting strip extending along the upper margin of said brassiere with its opposite ends disposed at said front points of attachment, said stretch inhibiting strips being imbedded in said latex.

10. A brassiere in accordance with claim 1 wherein the

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stretch inhibiting material possesses a higher modulus of elasticity than the remainder of the latex.

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