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2,629,099

BRASSIERE

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3 Sheets-Sheet 1

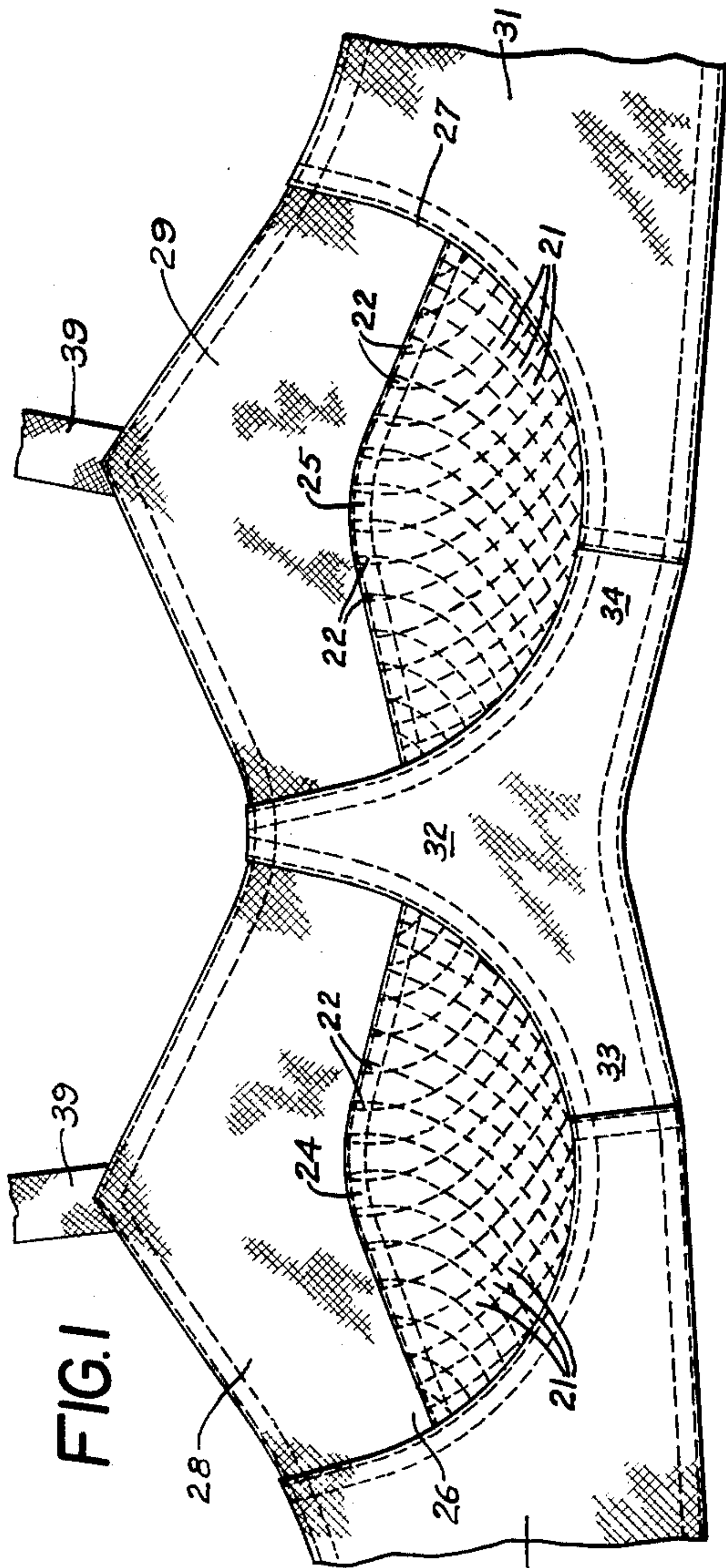


FIG. 1

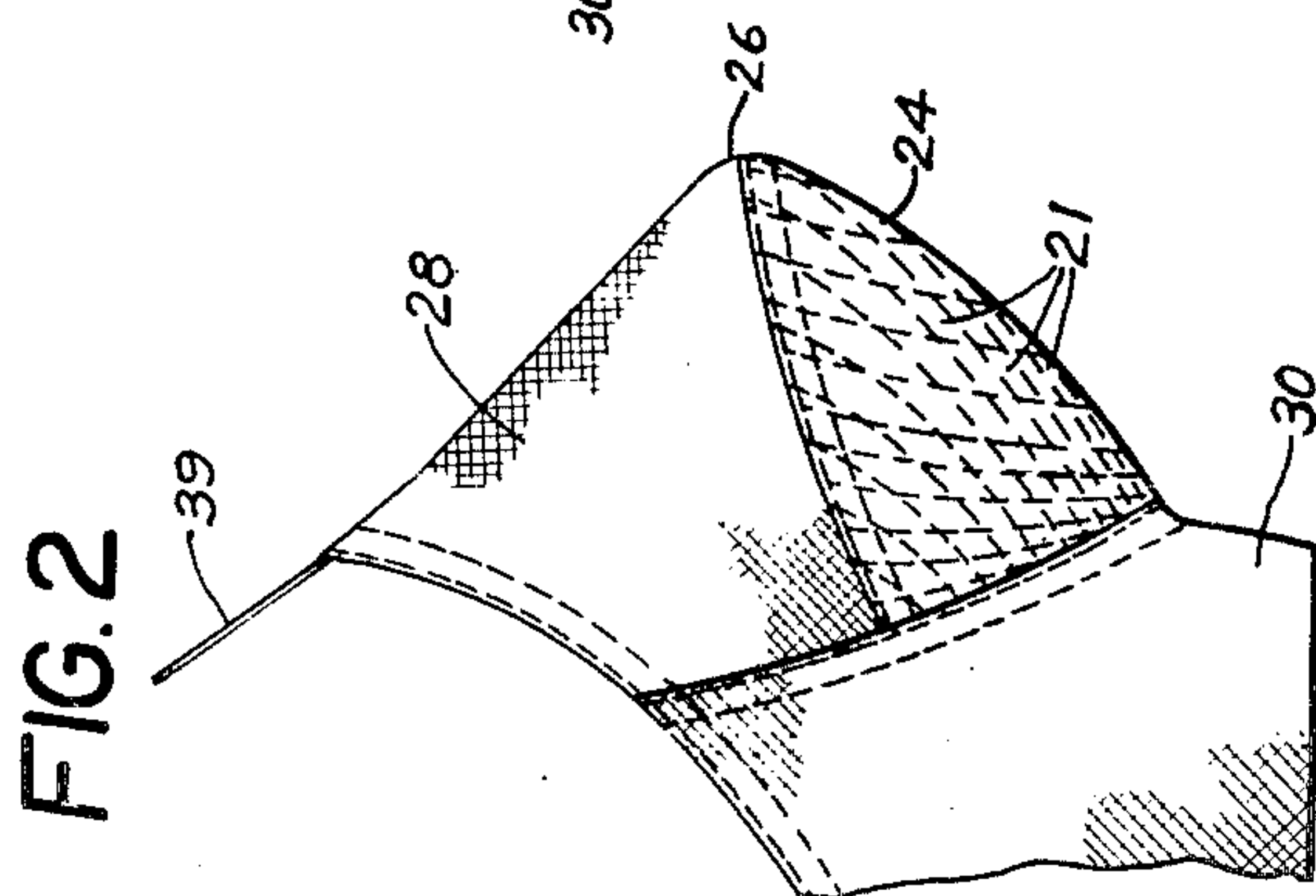


FIG. 2

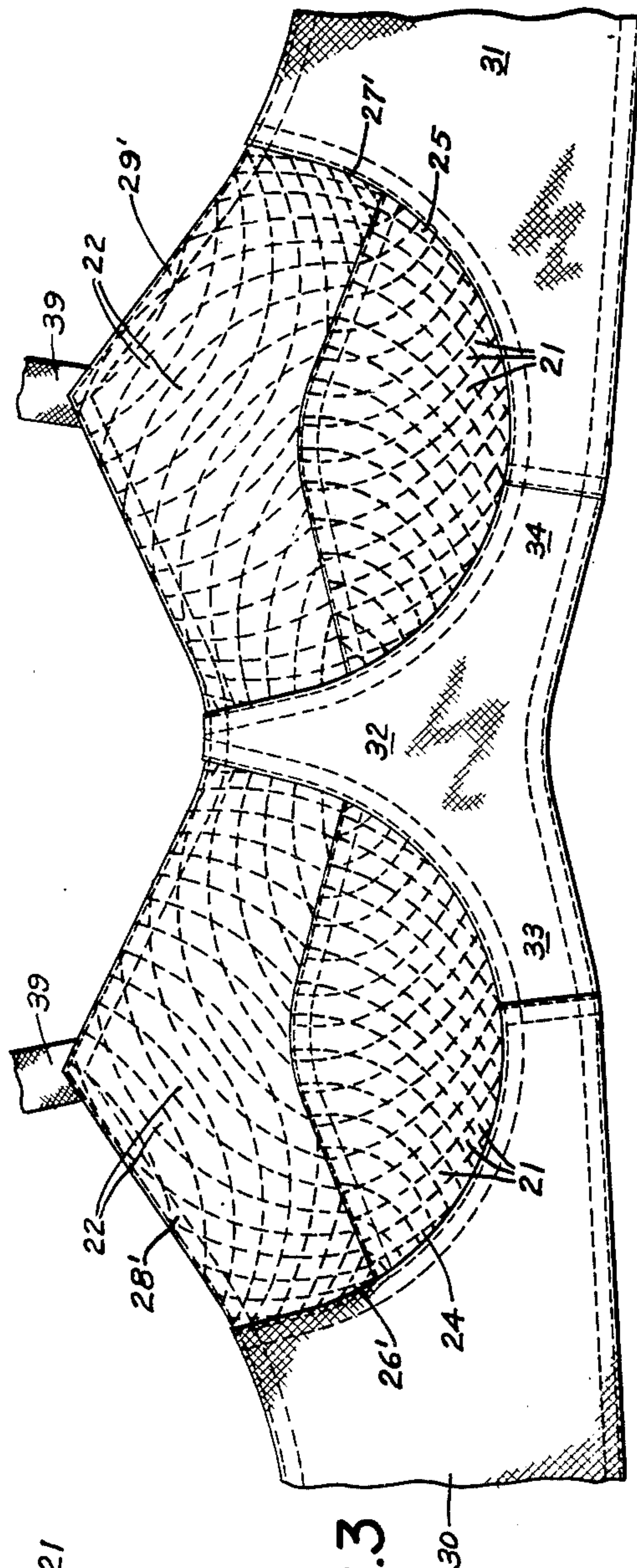


FIG. 3

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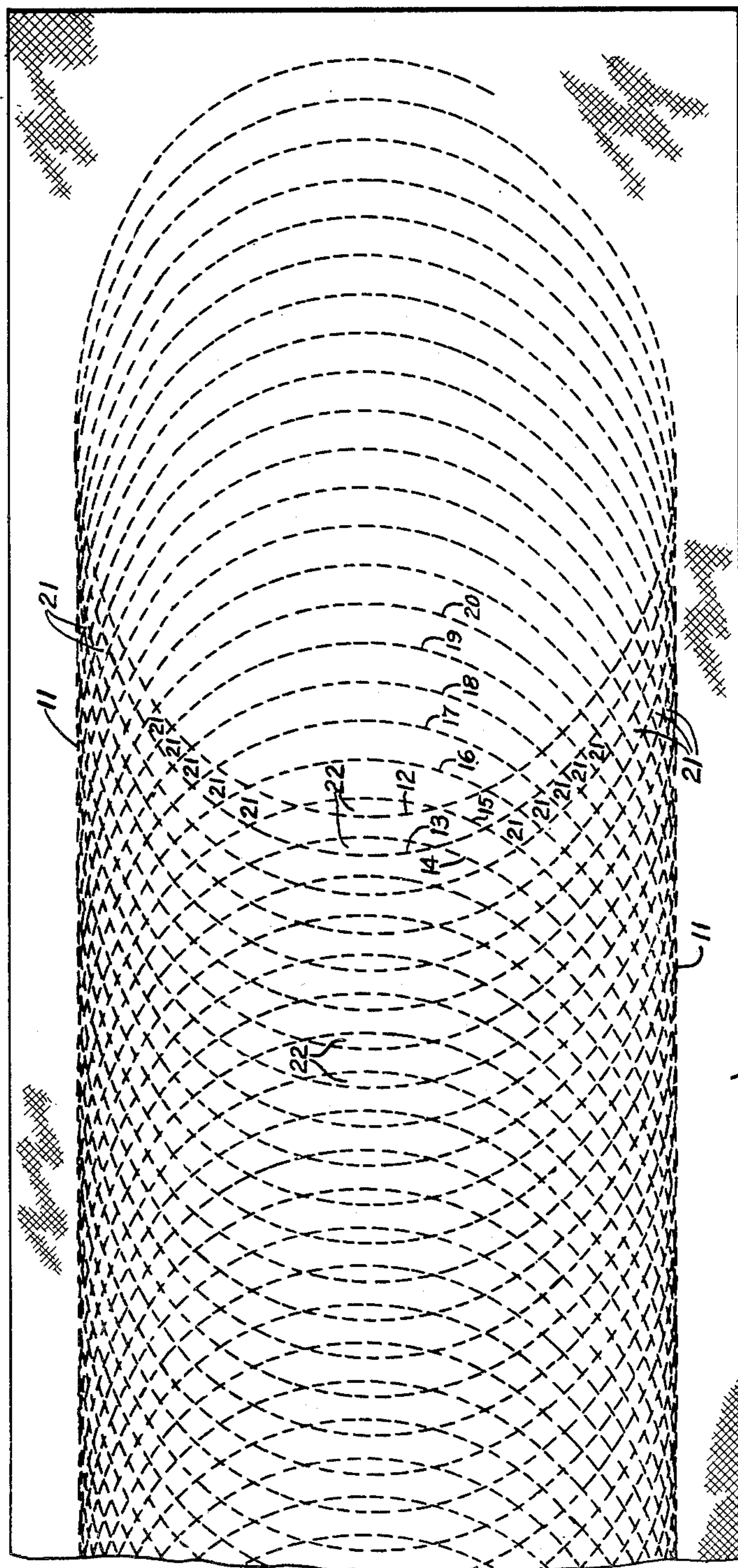


FIG. 4

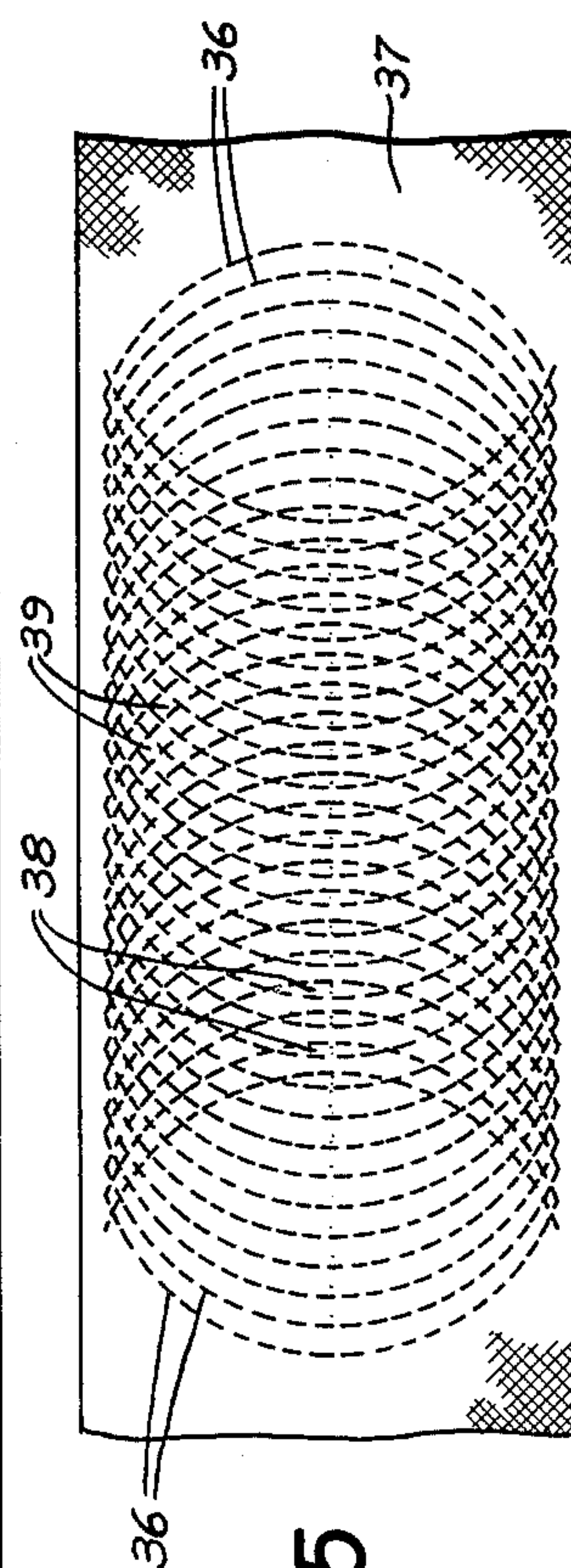


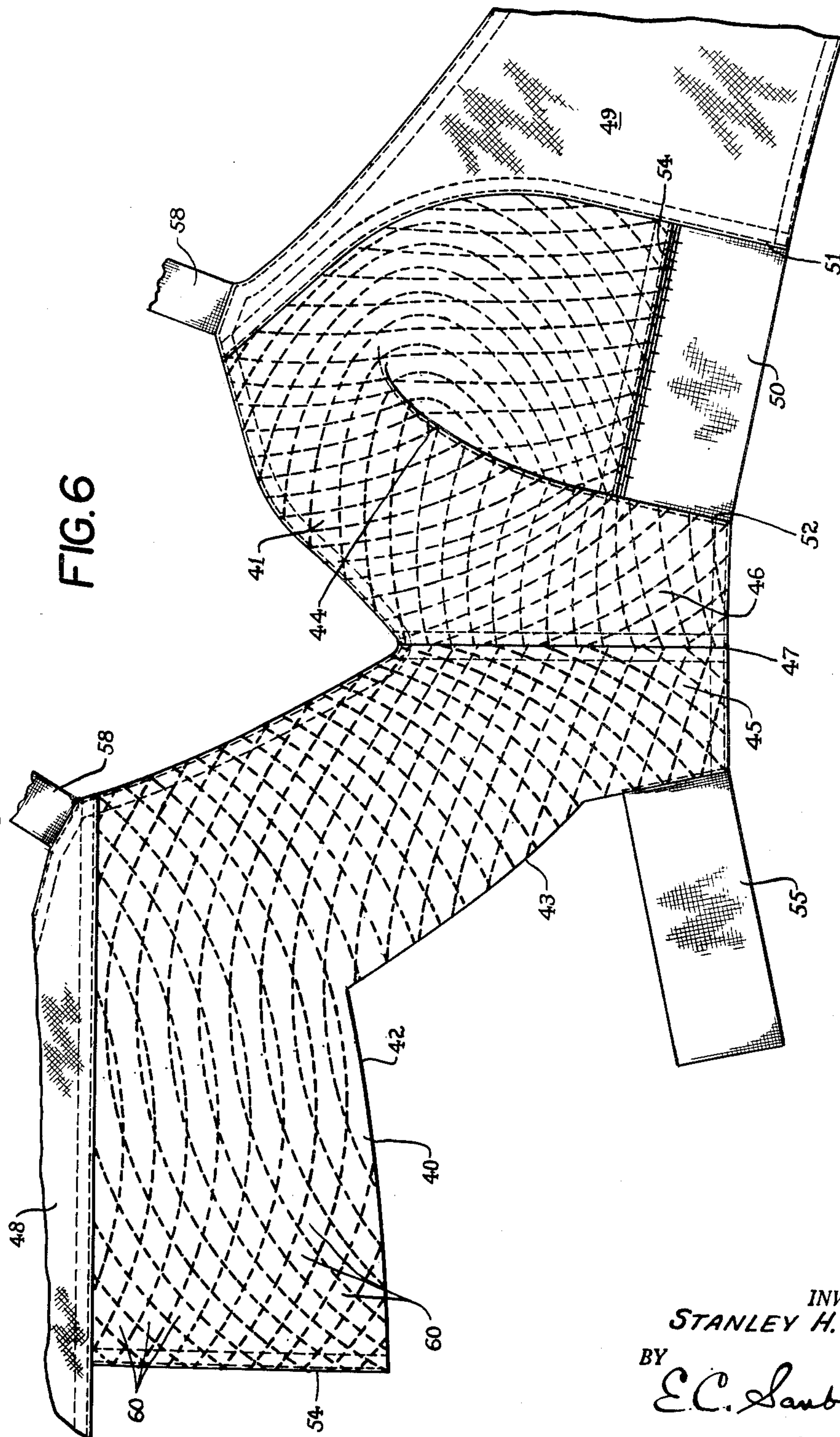
FIG. 5

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BRASSIÈRE

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6 Claims. (Cl. 2—42)

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This invention relates to brassières, and is particularly concerned with the provision of a novel and improved brassière capable of supporting the breasts with superior comfort and effectiveness.

An object of the invention is to provide a brassière wherein there is obtained, with light weight fabrics, a control over the breasts at least equal in firmness and supporting effect to that obtainable with heavier fabrics or with multiply materials, and with markedly enhanced comfort to the wearer.

In carrying out the invention, I first produce in a strip of fabric lines of stitching of curved or arcuate form each representing the path of travel of a point along an arc, the center of curvature of which moves in a given direction during the travel of said point along said arc. Effects both advantageous mechanically and pleasing in appearance are obtained by having the center of the arcuate stitching move forward slightly during the formation of a given extent of arc, so as to produce a series of intersecting arcuate stitch lines defining curvilinear quadrilateral figures of areas diminishing from the inner central regions of the arcs to their outer extremities.

From the fabric having the pre-stitched intersecting arcuate lines above referred to, pieces are cut for incorporation into the breast pockets of brassières. The lower portion of each breast-supporting pocket embodies material cut from said stitched fabric and so disposed that the aforementioned quadrilateral figures defined by the intersecting stitch lines diminish in area toward the bottom edge of said pocket. Thereby, as said bottom edge is approached, the supporting effect of the stitching progressively increases, giving greater support where such is needed; while in regions of the pocket more distant from said bottom edge an increasingly yieldable control is obtained through the progressively greater distances between stitches. The aforementioned quadrilaterals may also be employed in the center or any other region of the brassière to obtain desired supporting effects.

In consequence of the stitching above referred to, fabric substantially lighter than those heretofore used in brassières may be employed. Support equal at least to that provided by heavier or multi-ply fabrics is attained by my invention with lighter fabrics and with much greater comfort.

I am aware that prior attempts have been made to solve the problem of adequate bust sup-

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port in the various positions of the wearer without sacrifice of comfort. To that end various brassière manufacturers have for years included a plurality of parallel or concentric rows of stitching under the bust, roughly following the contour of the bottom bust section. Another attempt involved making the bust pocket in four sections from material prestitched in parallel rows; each section containing parallel rows of stitching and the four sections being sewed together so that said lines provided substantially closed geometrical figures surrounding the central point of the pocket and increasing in size outwardly from said point. Such arrangements, with their parallel lines of stitching, have not attained the results desired and are prone to impose an undesirable restriction upon the bust.

In another prior brassière, stitching was applied after the bust pocket was formed. The stitching followed the general line of a helical spiral, starting from the center of the pocket, and producing the same effect as rows of stitching running concentrically around the center point of the bust. Again, an undesirable pressure upon the bust was produced.

In still another prior brassière, lines of stitching are inserted after the bust-pocket sections are sewed together; said stitching lines extending from one side of the lower half of the pocket upwardly toward the upper half, then passing into said upper half and concentrically semicircling the apex of the pocket to form a series of concentric loops, then extending downwardly to the rear, and terminating in the lower half at the side opposite the side of origination. Here, again, as with other prior arrangements wherein the stitch rows are parallel or substantially concentric with the center of the bust pocket, the garment has been found to exert a flattening or constricting action upon the breast, or does not support it in all directions in different attitudes of the wearer, giving what wearers describe as a "shallow" effect.

Brassières embodying my invention avoid the foregoing disadvantages encountered in prior brassières, and, not only attain support of the breast where support is needed but also provide a soft fitting quality greatly enhancing the wearer's comfort.

Other features and advantages of the invention will be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a front elevational view of a brassière embodying one form of my invention.

Fig. 2 is a side-elevational view of the brassière shown in Fig. 1.

Fig. 3 is a front elevational view showing another form of my invention.

Fig. 4 is a plan view of a fabric containing stitch lines for inclusion in brassières in accordance with the invention.

Fig. 5 is a plan view of a fabric containing an alternative stitch pattern for inclusion in such brassières.

Fig. 6 is a plan view of another form of brassière embodying my invention; one breast-receiving portion of the brassière being shown open, in the form initially cut, and the other breast-receiving portion being shown with certain of its edges stitched together to form a three-dimensional breast-pocket.

Referring to the drawings, there is shown at 10 in Fig. 4, a fabric of any material suitable for inclusion in bust-receiving pockets of brassières. In this fabric I produce a series of over-lapping arcuate stitch lines 11. Each stitch line represents the path of travel of a point along an arc, the center of curvature of which moves in a given direction during the travel of said point along said arc.

It is well known that a curve traced by a point on the radius of a circle rolling on a line in a given plane is a cycloid. If the same circle were held at its center and revolved around the center, that same point would trace a circle. There is an infinity of positions, producing an infinity of patterns between the two extremes, ranging from the true circle to a cycloid. In the production of brassières embodying my invention, the extent of the arc of travel of the needle in producing a curved stitch line, and the extent of displacement of the center of said arc in any direction during travel of the needle through any particular length of arc, may be varied as desired.

As an example, advantageous and pleasing effects are obtained by having the needle move in a circle, the center of which circle moves forward approximately $\frac{1}{4}$ diameter in each complete revolution. A succession of such figures, as shown in Fig. 4, includes successive arcuate lines (such as indicated at 12 and 13) converging toward each other from their centers to their upper and lower ends, and intersecting other converging arcuate lines (such as 14—20) to produce curvilinear quadrilateral figures 21 of areas diminishing from the central region of said arcuate lines to the outer extremities thereof. In their central regions, in the example illustrated in Fig. 4, the arcuate stitch lines intersect to form loops 22.

While, of course, the needle may be operated by hand to produce the arcuate intersecting stitch lines illustrated in Fig. 4, it will be obvious that the needle of a conventional sewing machine may be made to trace such paths, and that the size of arc and displacement of center of curvature during travel of the needle along any arcuate distance may be varied.

After the stitching is completed in the fabric 10, pieces are cut out therefrom for the lower portions of the bust-supporting pockets of a brassière. For example, in Figs. 1 and 2, fabric pieces 24, 25, forming the lower portions of the respective bust-receiving pockets 26, 27, respectively, are cut from fabric having the stitching illustrated in Fig. 4. It will be noted that each of these fabric pieces comprises arcuate lines converging toward the bottom of the pocket and

intersecting other converging arcuate lines to form curvilinear quadrilateral figures 21 of areas diminishing toward said pocket bottom. The fabric pieces may also be so cut as to include in their top portions parts of the loops 22 in the central region of the fabric 10.

It will thus be seen that due to the aforementioned quadrilateral figures 21 of progressively diminishing area, the supporting effect of each bust-receiving pocket 26, 27, increases progressively as the bottom of the pocket is approached, giving greater support where such is needed. On the other hand, in regions more remote from said bottom an increasingly yieldable control is obtained as the result of the progressively greater distance between stitches.

In addition, due to the fact that all of the stitch lines are curved, and eccentric with respect to the center or apex of the bust pocket, they are not subject to linear strain to the same extent as straight or concentric stitches, in which tightness and cracking result.

While heavier fabrics in bust pockets give increased support, considerably heavier fabric would be required to provide the same support as a light fabric provided with my stitching, and at a marked sacrifice in comfort. Any desired light weight material may be employed in the fabric 10.

In an actual test, a light weight satin was employed in the lower portions of the pockets of a brassière, without my stitching above described, while the same fabric with said stitching was employed in the lower portions of another brassière. The brassière without the stitching formed folds, causing the breast of the wearer to droop and form a hollow in the upper section of the brassière. However, in the case of the brassière with the stitching, with all other items equal (same material, same size, same wearer) these folds did not appear. The stitching not only provided adequately for the support of the bust in all positions of the wearer, but furthermore conformed to the natural shape of the breast with resultant attractive appearance, even when the body was relaxed.

It will further be observed that in producing the stitching in the fabric 10 the stitching may be readily and accurately controlled in the desired diameter and pitch, and the pocket portions may be readily cut from any desired parts of the stitched fabric. This is distinctly advantageous over stitching after the bust pocket has been formed, wherein the paths of the stitching rows are left to the skills of different operators, and thus vary from one garment to another, or even within different pockets of the same garment.

The upper portions 28, 29, of the pockets 26, 27, may be of any fabric desired, stitched or unstitched. Thus, in the embodiment shown in Figs. 1 and 2, said upper pocket portions are shown as of unstitched fabric. However, in Fig. 3, the upper portions 28', 29' of the bust-supporting pockets 26', 27' are formed by fabric pieces cut from the fabric 10 in its central region wherein the stitches include the loops 22 and are more widely spaced than in the regions adjacent either end of the arcuate stitch lines.

In the embodiment illustrated in Fig. 3 it will be noted that the stitch lines in the upper pocket portions 28', 29', are spaced farther apart in the region overlying the upper central portion of the breast, while at each side of said region the lines form curvilinear quadrilaterals of areas diminish-

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ing toward the sides of the pocket. Thus, firmer control is provided at the sides of the upper pocket portions, and more yielding control in the central regions of said portions. A desirable yielding control is thereby obtained over the upper portion of the breast. It will, of course, be understood that the controlling effects in different portions of the pockets may be varied as desired, by cutting the pocket pieces from different portions of the fabric 10.

The lower portions 24, 25 of the pockets 26', 27', in Fig. 3 may, as shown, be formed in the same manner as those in Fig. 1, i. e., of fabric pieces cut from the fabric 10 in regions extending near or to the ends of the arcuate stitch lines, and including the curvilinear quadrilaterals 21 of areas diminishing progressively toward the bottoms of the pockets.

In both embodiments illustrated, the brassière is shown as including fabric side portions 30, 31, of conventional form which are attached to the bust-receiving pockets and extend beneath the arms of the wearer, said side portions being joined together by any suitable fastening means in the customary manner, as will be readily understood. Another fabric member 32 is positioned between the said pockets and attached thereto, said member having portions 33, 34, which extend beneath the lower portions of the pockets and also attached to the side pieces 30, 31. The aforementioned fabric members 30, 31, and 32 may be of any desired material. The usual shoulder straps 35 may be provided.

It will be understood that the lines of stitching in the fabric 10 need not extend completely around displaceable centers of curvature as above described, and that instead a similar stitch pattern may be obtained by having the needle follow a series of displaced arcuate paths converging toward their extremities, as indicated at 36 in the fabric 37, in Fig. 5. It will be noted that one group of the series of said arcuate stitches curves in one direction, while another group, curved in the opposite direction, intersects the stitches of the first group. Thereby there are produced central loops 38 and curvilinear quadrilateral figures 39 of areas progressively diminishing from said central loops to the end extremities of said arcuate stitch lines.

In Fig. 6 there is shown a further modified form of brassière embodying my invention. In this embodiment, fabric pieces 40, 41, are cut out of the fabric 10 of Fig. 4 (or fabric 37 of Fig. 5). As initially cut out, each of the pieces 40 and 41 is in the form shown for the fabric piece 40 in Fig. 6. Each of said pieces is then brought together at the edges 42, 43, and said edges are stitched together (as shown at 44 in the piece 41) to provide a breast-receiving pocket of desired three-dimensional shape. It will be noted that the pieces 40 and 41 not only provide breast-receiving pockets but also include portions 45, 46, which extend laterally and vertically from the breast-receiving pockets and are stitched together along their edges, as at 47, to extend between the breasts of the wearer. At their outer edges, the pieces 40 and 41 may be stitched to fabric pieces 48, 49 adapted to form the usual sides of the brassière. A strip 50 of longitudinally elastic material may be stitched at one side edge 51 to an edge of the side piece 49, and at its opposite side edge 52 to the adjacent edge of the portion 46 of the piece 41. Said strip 50 may also be stitched at its top edge 53 to the adjacent overlying horizontal edge 54 of the pocket-forming

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piece 41. A similar elastic strip 55 may be similarly stitched to the pocket-forming piece 40 and side piece 48, as will be apparent. Said elastic strips 50 and 55 thus extend immediately below breast-receiving portions of the brassière. Shoulder straps 58 of conventional form may be attached to the upper portions of the pieces 48, 49.

It will be noted that the breast-receiving piece 40 contains arcuate lines which (in the section between the edge 42 and side piece 48) converge toward the edge 54, and which intersect other converging arcuate lines to form curvilinear quadrilateral figures 60 of areas diminishing toward said edge 54. The latter edge, as shown in connection with the piece 41, forms the lower edge of the completed breast-receiving pocket. Thus, each pocket contains quadrilateral figures of areas diminishing toward a bottom edge of the pocket, increasing the supporting effect of the pocket as its bottom is approached. In the pocket shown as formed from the fabric piece 41 in Fig. 6, the curved quadrilaterals of progressively diminishing area are present but, due to the three-dimensional effect of the completed pocket they do not appear as prominently to the eye as in the flat piece 40. However, the piece 41 actually has the same arrangement of curvilinear quadrilaterals diminishing in area toward the lower edge 54 as above pointed out in connection with the piece 40. In their central regions, the pockets contain loops 61, corresponding to the loops 22 in Fig. 4 (or 38 in Fig. 5). The curvilinear quadrilaterals of varying areas are also present in the portions 45, 46 of the fabric pieces 40, 41, extending between the breasts of the wearer. A desirable supporting effect is thereby produced in that region.

The term "brassière" as used in the foregoing specification and in the appended claims is to be understood as including the brassière portions of combination garments, such as corselettes or combined girdles and brassières.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

I claim:

1. A brassière comprising a pair of breast-receiving pockets, each of said pockets being provided in its lower portion with arcuate lines of stitching, a plurality of said arcuate lines curving toward the right in said lower portion toward the bottom thereof and converging toward said bottom, and another plurality of said arcuate lines curving toward the left in said lower portion toward the bottom thereof and converging toward said bottom, the last mentioned plurality of arcuate lines intersecting the first mentioned plurality of arcuate lines to form therewith curved quadrilateral figures of areas diminishing toward the bottom of said pocket.

2. A brassière comprising a pair of breast-receiving pockets, each of said pockets being provided in its lower portion with pre-formed arcuate lines of stitching, a plurality of said lines curving toward the right in said lower portion and converging toward the bottom thereof and another plurality of said lines curving toward the left in said lower portion and converging toward the bottom thereof, the last mentioned plurality of lines intersecting the first mentioned

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plurality to form therewith curved quadrilateral figures of areas diminishing toward the bottom of said pocket.

3. The method of producing a bust-pocket of a brassière, comprising stitching a fabric to form therein arcuate stitch lines while displacing the centers of said arcuate stitch lines longitudinally to cause said lines to converge toward each other from their central regions toward their outer extremities and to intersect to define curvilinear quadrilateral figures of areas diminishing progressively from said central region toward said outer extremities of said arcuate lines, cutting a piece of fabric from a portion of said stitching, and including said piece in the lower portion of said bust-pocket.

4. A brassière as defined in claim 1, wherein each of said pockets has other arcuate intersecting lines of stitching in its upper portion defining curved loops in the central region and curvilinear quadrilateral figures in the side regions of said upper portion.

5. A brassière as defined in claim 1, wherein the upper portion of each of said pockets is free of stitching lines.

6. A brassière as defined in claim 1, said

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brassière also having portions extending into zones at the sides of said pockets, each of which side portions is provided with intersecting arcuate lines of stitching defining curvilinear quadrilateral figures of varying areas.

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