

March 17, 1970

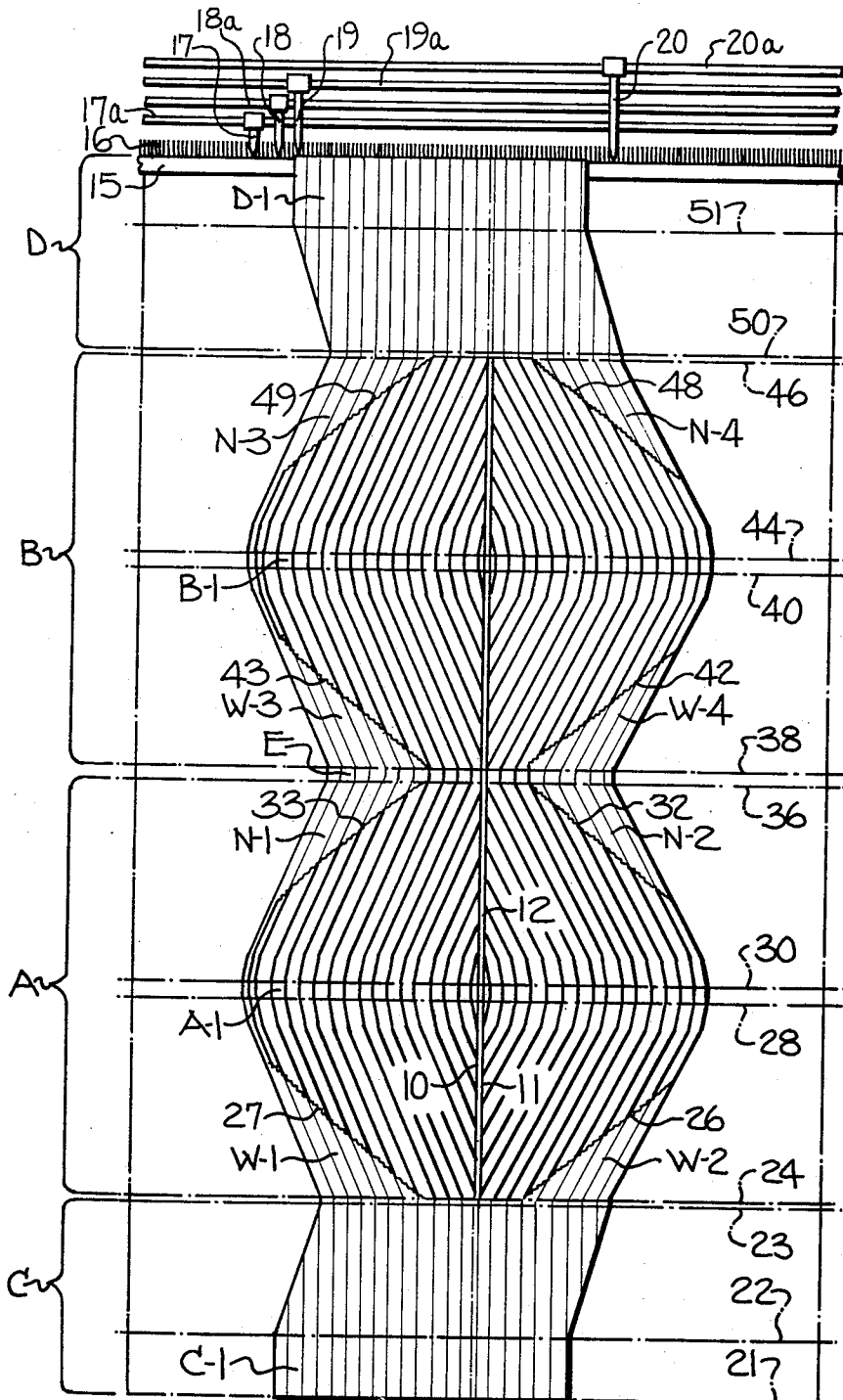
R. C. BRAXTON ETAL

3,500,665

FULL-FASHIONED BRASSIERE AND BLANK

Filed Feb. 16, 1968

3 Sheets-Sheet 1



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Fig. 1

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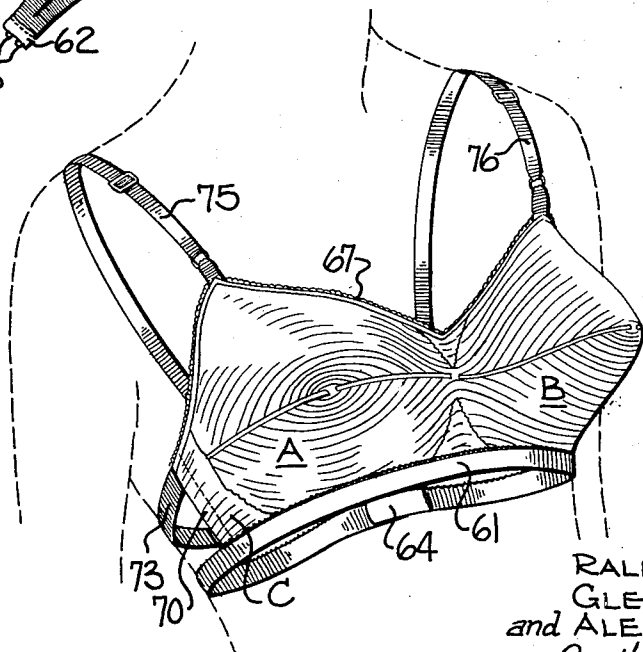
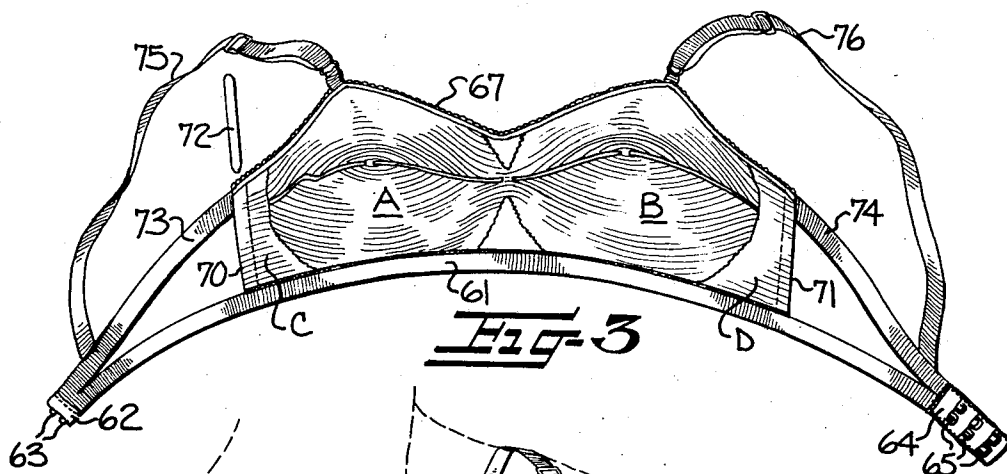
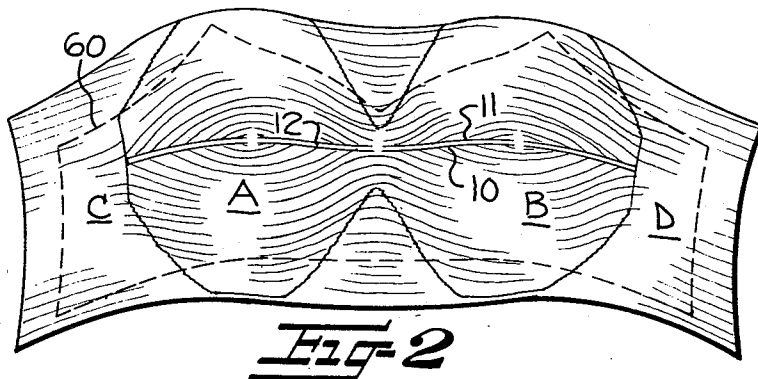
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

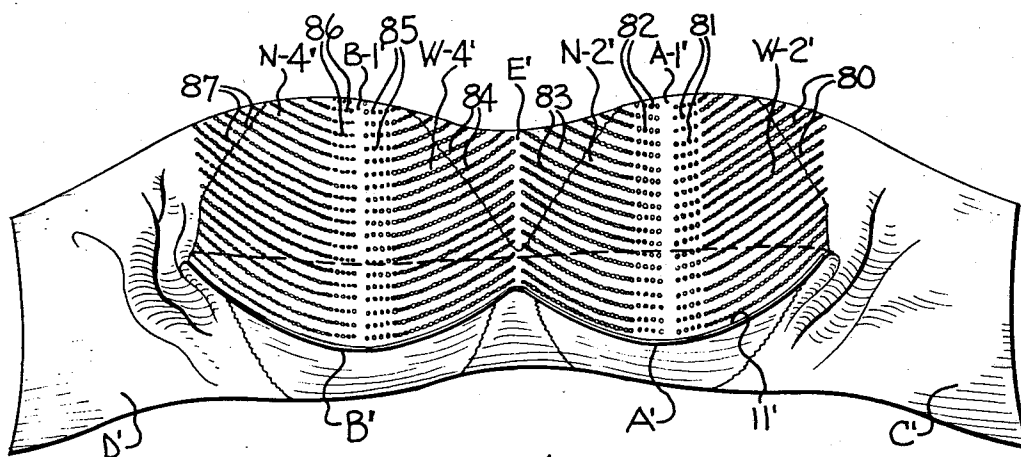


Fig-5

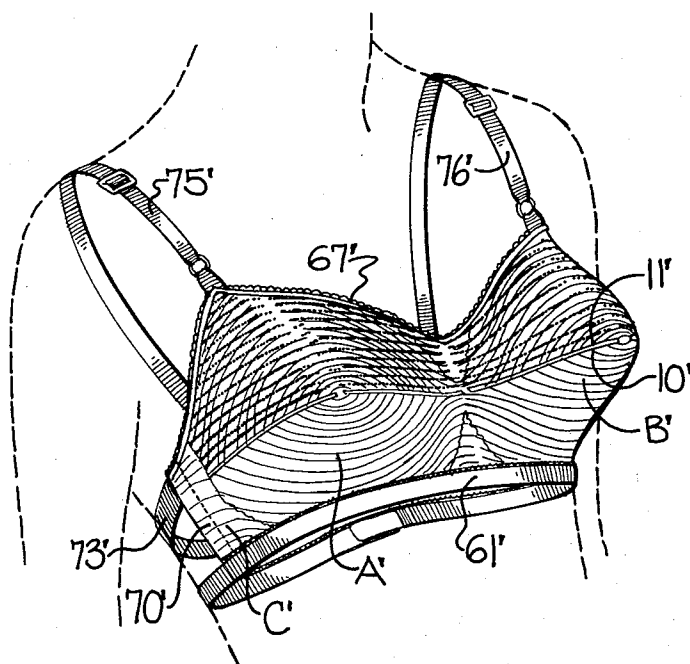


Fig-6

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FULL-FASHIONED BRASSIERE AND BLANK

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14 Claims

ABSTRACT OF THE DISCLOSURE

Fashioned brassiere blanks are knit on a full-fashioned knitting machine and include band portions extending outwardly from opposite ends of pairs of fashioned breast-receiving cups or pockets. Opposite side edges of the band portions extend at an acute angle from the pockets to provide better fit and support to the brassiere. The lower portions of the cups may include extra yarns to reinforce or covered spandex yarn to provide extra support while the upper portions may include an open pattern design.

This invention relates generally to a full-fashioned brassiere and more particularly to a full-fashioned brassiere blank which includes integral band portions knit at each end of a pair of fashioned breast-receiving cups.

The Alex Levine Patent No. 3,092,987 discloses an elongate brassiere blank which is knit on a full-fashioned knitting machine by continuously knitting from one end to the other and while successively widening and narrowing to form a pair of breast cups or pockets. The brassiere blank disclosed in this Levine patent has very short and tapering strap tabs formed at opposite ends of the fashioned breast cups. The fashioning of the breast cups of this patent requires two different types of widening and narrowing operations, which tends to slow the production rate and produces noticeable variations in the type of fashioning marks which are formed across the center of the breast cups.

It is an object of the present invention to provide a full-fashioned brassiere blank in which the breast cups are fashioned in a relatively simple manner to permit rapid production, to simplify adding reinforcing yarns to selected portions of the cups, to permit variations to be made in the stitch patterns formed in selected portions of the cups, and to provide attractive lines of fashioning marks extending across each of the breast cups.

It is another object of this invention to provide a fashioned brassiere blank having "biased" or pitched band portions extending outwardly at acute angles from opposite ends of the breast cups. In the finished brassiere, the downward angle of the biased band portions causes the fabric in the lower area between the breast cups to be tensioned and thereby prevents the occurrence of slackness and bulges in the fabric in this area of the brassiere. The angular bias or downward pitch of the band portions also provides the brassiere with better support characteristics.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when

2

taken in connection with the accompanying drawings, in which:

FIGURE 1 is a somewhat schematic plan view of the "purl" side of the full-fashioned brassiere blank with the last course on the needles of one head of a full-fashioned knitting machine and illustrating the yarn carriers required to knit the blank;

FIGURE 2 is a plan view of the "knit" side of the brassiere blank, removed from the knitting machine, and illustrating the manner in which the outer portion of the blank is trimmed to form the body portion of a brassiere;

FIGURE 3 is a view similar to FIGURE 2 but showing the finished brassiere with the binding and shoulder straps attached to the trimmed brassiere blank;

FIGURE 4 is a front view of the finished brassiere as it appears when worn;

FIGURE 5 is a plan view of the "purl" side of a modified form of brassiere blank wherein the upper panels of each breast cup are provided with an open-stitch type pattern and with the lower panels folded so that the upper panels are flat; and

FIGURE 6 is a view similar to FIGURE 4 and showing a finished brassiere formed of the modified form of blank shown in FIGURE 5, with the "knit" side outermost.

Referring particularly to FIGURE 1, generally, the brassiere blank includes a pair of fashioned breast cups or pockets A and B and biased or pitched band portions C and D which extend outwardly in opposite directions and downwardly at acute angles from the respective breast cups A, B. The blank shown in FIGURE 1 is shaded with lines representing the direction in which the wales of the fabric extend, it being understood that the courses extend transversely across the fabric blank from one selvage to the other. The space between the wale lines represents approximately ten wales in the knit fabric.

A pair of fashioning mark lines 10 and 11 extends longitudinally through the breast cups A and B and are separated by a few plain wales, indicated at 12. The breast cup A includes widened sections W-1 and W-2 located on opposite sides of the respective fashioning mark lines 10, 11, a few non-fashioned plain courses in a narrow area A-1, and narrowed sections N-1 and N-2. The breast cup B includes widened sections W-3 and W-4, a few non-fashioned plain courses in a narrow area B-1, and narrowed sections N-3 and N-4. It is preferred that opposite ends of the respective biased bands C, D include short straight terminal end sections C-1 and D-1. A few non-fashioned plain courses are preferably knit between the breast pockets A and B to provide a narrow area E.

The widened section W-2 and narrowed section N-2 define an upper fashioned panel of the breast cup A and the widened section W-1 and narrowed section N-1 define a lower fashioned panel of the breast cup A. The widened section W-4 and narrowed section N-4 define an upper fashioned panel of the breast cup B and the widened section W-3 and narrowed section N-3 define a lower fashioned panel of the breast cup B.

As an illustrative but non-limiting example, the knitting of a particular brassiere blank will be described, with reference to FIGURE 1, which is suitable for form-

ing a size 34B brassiere. It is to be understood that the number of narrowings and widenings, the number of needles knitting, and the number of courses will be varied in accordance with the size of the brassiere. Also, the type of yarn may be varied to provide the desired type of support and/or stretch which is desired in the brassiere. It is preferred that the blank be knit of thermoplastic body yarn to permit the heat-setting of the breast cups and that the reinforcing yarn be knit in plated relationship with the body yarn to provide additional support. Only one knitting head of the full-fashioned knitting machine is schematically illustrated in FIGURE 1, it being understood that the machine includes a plurality of such heads which operate simultaneously to produce identical brassiere blanks.

The parts of the knitting machine schematically shown at the top of FIGURE 1 include a needle bar 15 having needles 16 supported therein. Yarn carriers 17-20 are conventionally supported on respective carrier rods 17a-20a for transverse movement back and forth across the needle bar 15. The paths of travel of the yarn carriers are selectively limited at opposite ends by the well-known carrier control mechanism of the full-fashioned knitting machine.

The yarn carriers 17 and 20 may be termed reinforcing carriers and are each threaded with one end of 40/7 nylon and one end of 20/1 nylon. The yarn carriers 18, 19 may be termed body yarn carriers and the carrier 19 is threaded with one end of 50/2 stretchable textured nylon, while the carrier 18 is threaded with three ends of 20/1 nylon.

The brassiere blank is progressively knit from the bottom to the top in FIGURE 1 and the carriers 18 and 19 continuously operate to feed their yarns to the needles from one selvage to the other so that the yarns are knit in plated relationship. The yarn fed by carrier 19 is preferably textured by the well-known false-twist method to give it bulk and make it stretchable. The yarn fed by the carrier 18 is inelastic and limits the stretchability of the fabric.

Starting at the dash-dot line 21, the straight portion C-1 is first knit on 200 needles with the body yarn carriers 18, 19 traversing back and forth across these same 200 needles as each successive course is knit. The reinforcing carriers 17 and 20 remain in idle positions during the knitting of this straight portion C-1. After 53 plain courses are knit, at the dash-dot line 22, the end limits of travel of the carriers 18, 19 are successively stepped over to the right so that the opposite side selvage edges of the biased band portion C extend at an acute angle, relative to the wales of the fabric. In the present instance, the limits of travel of the carriers 18, 19 are successively stepped over while 91 courses are being knit, up to the dash-dot line 23. At the dash-dot line 23, 200 needles are still knitting, but the fabric has been gradually moved over 28 needles to the right.

Four plain courses are then formed on these 200 needles between the dash-dot line 23 and a dash-dot line 24. The reinforcing yarn carrier 20 is activated to travel on the right-hand side of the fashioning mark line 11 and form a reinforced area in the upper panel of the breast cup A, as defined by a stepped edge 26. At the same time, the reinforcing yarn carrier 17 is activated to travel on the left-hand side of the fashioning mark line 10 and form a reinforced area in the lower panel of the breast cup A, as defined by a stepped edge 27. Sets of narrowing points, not shown, are activated to begin widening the fabric while the outer limits of travel of the body yarn carriers 18, 19 are correspondingly increased.

The reinforcing yarn of the carrier 20 is initially fed to 24 needles on the right-hand side of the fashioning mark line 11 while the reinforcing yarn of the carrier 17 is initially fed to 34 needles on the left-hand side of the fashioning mark line 10. Four needles between the

fashioning lines 10, 11 form plain wales solely of the body yarns throughout the knitting of both breast cups A, B. During the knitting of the first 124 courses of the widened sections W-1 and W-2, the fabric is widened one needle on each side, following the knitting of every other course. During the knitting of the next 20 courses, the fabric is widened one needle on each side following the knitting of every fourth course. Thus, a total of 144 courses are knit in the widened sections W-1, W-2 and between the dash-dot line 24 and a dash-dot line 28. At the dash-dot line 28, there are 336 needles knitting; 158 needles on the right-hand side of the fashioning mark line 11; 174 needles on the left-hand side of the fashioning mark line 10; and 4 needles between the fashioning mark lines. Between the dash-dot line 28 and a dash-dot line 30, 12 plain non-fashioned courses are knit with the yarn carriers traversing the same 336 needles and the narrowing points in an inactive position. These 12 plain courses define the transverse center of the breast cup A.

During the knitting of the narrowed sections N-1 and N-2, the outer limits of the paths of travel of the reinforcing yarn fingers 20 and 17 are gradually stepped inwardly to form reinforced areas defined by stepped edges indicated at 32, 33. The opposite ends of the paths of travel of the body yarn carriers 18, 19 are gradually stepped in as the narrowing points operate to form inwardly tapered opposite selvage edges. This narrowing operation, carried out between the dash-dot line 30 and a dash-dot line 36, encompasses 144 courses. During the knitting of the first 20 courses, the fabric is narrowed one needle at each side following the knitting of every fourth course and during the knitting of the next 124 courses, the fabric is narrowed one needle at each side following the knitting of every other course.

Between the dash-dot line 36 and a dash-dot line 38, 14 non-fashioned plain courses are knit. During the knitting of these courses, the reinforcing yarn carrier 20 feeds yarn to 24 needles on the right-hand side of the fashioning mark line 11 and the reinforcing yarn carrier 17 feeds yarn to 34 needles on the left-hand side of the fashioning mark line 10 while the body yarn carriers feed their yarns to 200 needles.

The widened sections W-3 and W-4 of the breast cup B are knit up to the dash-dot line 40 to form outwardly diverging opposite side selvage edges in the same manner as the widened portions W-1 and W-2 between the dash-dot lines 24, 28. The reinforcing carriers 17, 20 are stepped out to form reinforced areas defined by stepped outer edges indicated at 42, 43. Twelve non-fashioned plain courses of the same width are next knit between the dash-dot line 40 and a dash-dot line 44. These 12 courses are knit on 336 needles and define the coursewise transverse center of the breast cup B.

The narrowed sections N-3 and N-4 are next formed between the dash-dot line 44 and a dash-dot line 46 and in the same manner as the narrowed sections N-1 and N-2. The reinforcing fingers 17, 20 are stepped inwardly, in the same manner as they were during the knitting of the narrowed sections N-1 and N-2 of the breast cup A, to form reinforced areas defined by opposite stepped edges, indicated at 48, 49. Four non-fashioned plain courses are then knit between the dash-dot line 46 and a dash-dot line 50. These four courses are knit on the same 200 needles as the four plain courses between the dash-dot lines 23, 24.

During the knitting of that portion of the biased band portion D between the dash-dot line 50 and a dash-dot line 51, the reinforcing yarn fingers 17, 20 and narrowing points are inactive and the body yarn fingers 18, 19 gradually step over to the left as 91 courses are knit, down to the dash-dot line 51. The body yarns are then knit on the same 200 needles for the next 53 courses to complete the knitting of the garment blank. The fashioned blank is provided with uncut selvage edges along opposite sides which are formed during the knitting op-

eration and as the knitting yarn extends from one course to the next at each side of the blank. It is to be understood that successive garment blanks may be knit and joined end to end, if desired.

To form a complete brassiere, as shown in FIGURES 3 and 4, of the fashioned brassiere blank, suitable trim and supporting straps must be added. The outer edges of the blank may be trimmed or cut to the desired shape, as indicated by the dotted line 60 in FIGURE 2. Also, the blank may be marked along the dotted line 60 to provide a guide for the sewing machine operator, if an overedge seamer having a trimming attachment is to be used.

In either case, the medial portion of an elastic body tape 61 is attached, as by an overedge seam, to the lower edge portion of the body portion of the brassiere blank (FIGURE 3) and the opposed ends of the tape 61 extend outwardly beyond opposite ends of the blank. A fastener tab 62 having suitable hook elements 63 is attached to one end of the tape 61. A fastener tab 64 is suitably connected to the other end of the tape 61 and is provided with rows of loops 65 into which the hook elements 63 may be fastened to adjustably connect opposite ends of the tape at the back of the wearer.

The upper edge portion of the body portion of the brassiere blank has an ornamental binding tape 67 suitably secured thereto. Opposite end portions of the biased band portions C, D of the brassiere blank are folded over and stitched to form opposed end hems 70, 71. Plastic stiffening stays, such as indicated at 72 in FIGURE 3, are preferably positioned in the hems 70, 71.

Elastic tape bands 73, 74 are suitably connected at their inner ends to the upper edge portion of the brassiere body portion and their outer ends are connected to the respective fastening tabs 62, 64 and the ends of the elastic tape 61. Suitable shoulder straps 75, 76 are connected at one end to the upper edge portion of the brassiere blank, above the respective breast cups A and B, and are suitably connected at the other end to the respective tape bands 73, 74. The shoulder straps 75, 76 may include elastic portions and may be provided with the well-known length adjustment means.

In the modified form of brassiere blank shown in FIGURE 5, the knitting and fashioning is carried out in the same manner as that described in connection with FIGURE 1 except that the right-hand set of stitch transfer points forms an open-stitch pattern in the upper panels of the breast cups. Since both forms of brassiere blank include the same parts, the parts of the modified form of brassiere blank will bear the same reference characters as corresponding parts of the brassiere blank illustrated in FIGURES 1-4, with the prime notation added.

The right-hand set of transfer points is modified to form the upper panels of the breast cups by removing certain of the transfer points to form a pattern of lines or rows of open stitches. For example, the pattern rows of open stitches may be formed close together by removing every third or fourth transfer point or they may be formed wide apart by removing every ninth or tenth transfer point.

In the brassiere blank shown in FIGURE 5, the pattern of open stitches is formed by a set of transfer points in which every seventh transfer point has been removed.

During the knitting of the widened section W-2' (FIGURE 5), a course is first knit with a stitch loop being formed on every needle, from the fashioning mark line 11' over to the selvedge edge. Then, groups of six successive stitch loops are picked up by the modified set of narrowing points and transferred outwardly to the next adjacent needles. Since every seventh transfer point is removed, the stitch on every seventh needle will not be picked up but will have a second stitch transferred thereto. The stitch on the needle to the right of the seventh needle will be removed and no stitch will be transferred to it so that an opening or open stitch is formed in the fabric.

The modified transfer bar continues to operate to form

these open stitches following the formation of every other widened course and during the knitting of the first 124 courses of the widened area W-2' to form parallel rows or lines of open stitches, indicated at 80 in FIGURE 5. The lines of open stitches 80 extend at an angle across the widened section W-2' and downwardly toward the center of the breast cup A'. During the knitting of the final 20 courses of the widened section W-2', the modified transfer bar operates after the knitting of each 4 widened courses to form rows or lines of open stitches, indicated at 81 in FIGURE 5. Since the open stitches in rows 81 are formed at every fourth course, they are spaced further apart than the open stitches in rows 80 and the angular inclination of the rows 81 is not as steep as the rows 80. The modified transfer bar is inactive during the knitting of the non-fashioned plain courses in the central area A-1' of the breast cup A' so that no open stitches are formed.

The modified transfer bar is again activated during the knitting of the narrowed section N-2' and during the knitting of the first 20 courses it operates after the knitting of each fourth course to transfer groups of six successive stitches inwardly and to form lines or rows of spaced apart open stitches, indicated at 82 in FIGURE 5. The modified transfer bar then operates after the knitting of every other course for the next 124 courses of the narrowed section N-2' to form lines or rows of open stitches indicated at 83 in FIGURE 5. During the knitting of the narrowed section N-2', the modified transfer bar transfers the groups of six successive stitches inwardly toward the center of the breast cup and in the opposite direction from the direction in which they were transferred to form the rows of open stitches in the widened section W-2'.

Following the knitting of the plain courses at the center of the blank, as indicated at E' in FIGURE 5, the modified transfer bar again operates to transfer the groups of six successive stitch loops outwardly after the knitting of every other widened course in the section W-4' to form lines of open stitches, indicated at 84 in FIGURE 5. The lines of open stitches 84 extend across the first 124 courses of the widened section W-4'. During the knitting of the last 20 courses of the widened section W-4', the modified transfer bar operates after the knitting of every fourth course to form lines of wider spaced open stitches, indicated at 85.

The modified transfer bar is inactive during the knitting of the plain courses in the section B-1' at the center of the breast cup B'. The modified transfer bar again operates during the knitting of the first 20 courses of narrowed section N-4' to move the groups of six successive stitch loops inwardly, following the knitting of each fourth course, to form lines 86 of widely spaced open stitches. During the knitting of the next 124 courses, the modified transfer bar operates following the knitting of every other narrowed course to transfer the groups of six successive stitch loops inwardly and form lines 87 of closely spaced open stitches.

When the brassiere blank shown in FIGURE 5 is trimmed and finished, as shown in FIGURE 6, the upper panels of each of the breast cups A', B' include the lines or rows of open stitches with the lines 80, 81 and 82, 83 converging inwardly toward the transverse center of the breast pocket A' and the lines 84, 85 and 86, 87 converging inwardly toward the transverse center of the breast pocket B'. The converging lines of open stitches extend substantially parallel to the fashioning mark lines 11' and provide an attractive pattern in the upper panels of the breast cups A' and B'. The outer edge portions of the brassiere blank shown in FIGURE 5 may be trimmed in the same manner as the first form of blank and provided with the same type of trim and supporting straps, as shown in FIGURE 6.

In each form of brassiere blank, the biased band portions may be knit longer so that they extend around opposite sides of the body of the wearer. Also, the stay 72 (FIGURE 3) may be eliminated and suitable stretch-

able band portions may be added to extend around opposite sides of the body of the wearer. While the fashioned blank of the present invention is particularly adapted to be used in forming brassieres, the fashioned blank may be used to form other types of garments with breast-receiving cups or pockets therein, such as swimsuit tops, halters, and the like.

In the drawings and specification there have been set forth preferred embodiments of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

We claim:

1. A knit full-fashioned elongate blank adapted to form a breast-receiving article, such as a brassiere, the knit wales of said blank extending in a generally longitudinal direction, said blank comprising

(a) a pair of fashioned breast cups formed in the medial portion of said blank, said cups each including successive sections of widened and narrowed knit courses extending transversely of said blank to opposite selvages thereof, and

(b) biased band portions knit integral with and extending in opposite directions from said breast cups, said band portions each including substantially parallel opposite uncut selvage edges, and said opposite edges of said band portions extending at acute angles relative to the longitudinally extending wales of said band portions.

2. A full-fashioned brassiere blank according to claim 1 wherein narrow areas of transversely extending non-fashioned courses are formed between said widened and narrowed sections of each of said fashioned breast cups.

3. A full-fashioned brassiere blank according to claim 2 wherein a narrow area of transversely extending non-fashioned courses is formed between said fashioned breast cups.

4. A full-fashioned brassiere blank according to claim 1 wherein terminal end sections are knit integral with and extend outwardly from opposite ends of said biased band portions, each of said terminal end sections including parallel opposite sides extending parallel to the wales of said end sections.

5. A full-fashioned brassiere blank according to claim 1 wherein each of said breast cups includes closely spaced lines of fashioning marks extending longitudinally thereacross, and wherein said widened and narrowed sections on one side of said fashioning mark lines define upper panels of each breast cup, and said widened and narrowed sections on the other side of said fashioning mark lines define lower panels of each breast cup.

6. A full-fashioned brassiere blank according to claim 5 wherein said breast cups are knit throughout of body yarns comprising a thermoplastic stretchable textured yarn and a non-stretchable thermoplastic yarn knit in plated relationship therewith, said stretchable textured yarn providing bulk to the fabric and said non-stretchable yarn limiting the stretch of the fabric, and said thermoplastic yarns permitting the heat-setting of said breast cups.

7. A full-fashioned brassiere blank according to claim 5 wherein said breast cups are knit throughout of body yarns, and additional yarns are knit with said body yarns in selected portions of said panels of said breast cups.

8. A full-fashioned brassiere blank according to claim 7 wherein said additional yarn is covered spandex and is knit in plated relationship with said body yarn in selected portions of said lower panels of each of said breast cups.

9. A full-fashioned brassiere blank according to claim 7 wherein said additional yarn is inelastic and is knit in plated relationship with said body yarn in selected portions of selected panels of each of said breast cups to provide reinforcement.

10. A brassiere comprising an integrally knit body portion, bindings surrounding said body portion, and support strap means, said body portion comprising

(a) a pair of fashioned breast cups, said cups each including successive sections of widened and narrowed knit courses extending transversely of said cups, said breast cups being knit of thermoplastic yarn to permit heat setting, at least selected portions of said breast cups including a reinforcing yarn knit in plated relationship with said thermoplastic yarn to provide additional support, and fashioning mark lines extending longitudinally of said cups and defining upper and lower panels on opposite sides thereof, and

(b) biased band portions knit integral with and extending in opposite directions from said breast cups, said band portions extending downwardly at acute angles relative to said fashioning mark lines; and said bindings and support strap means comprising

(a) an elastic body tape connected along a medial portion to the lower edge portion of said body portion and having opposed ends extending outwardly therebeyond,

(b) fastening means connected to opposed ends of said elastic body tape for releasably joining opposed ends together,

(c) binding tape means connected along the upper edge portion of said body portion, and

(d) shoulder straps having opposed ends, one end of each of said shoulder straps being connected to the upper edge portion of said body portion and above said breast cups, and the other end of each of said shoulder straps being connected to said elastic body tape and adjacent said fastening means.

11. A brassiere according to claim 10 including a hem formed at opposed ends of said body portion, a stiffening stay positioned in said hem and extending between said binding tape and said elastic body tape, and a pair of elastic tape bands, said elastic tape bands being connected between the upper portions of said hems and said fastening means.

12. In a brassiere according to claim 10 wherein said widened and narrowed sections of said upper panels of each of said breast cups include spaced apart lines of open stitches formed by transferred stitch loops, and wherein said lines converge inwardly toward the transverse center of each breast pocket and are substantially parallel to said fashioning mark lines.

13. A knit full-fashioned elongate blank adapted to form a breast-receiving article, such as a brassiere, the knit wales of said blank extending in a generally longitudinal direction, said blank comprising

(a) a pair of fashioned breast cups formed in the medial portion of said blank, said cups each including successive sections of widened and narrowed knit courses extending transversely of said blank to opposite selvages thereof,

(b) closely spaced lines of fashioning marks extending longitudinally of said breast cups and defining upper and lower panels on opposite sides thereof,

(c) spaced apart parallel lines of open stitches in said upper panels of each breast cup, said lines of open stitches converging inwardly toward the transverse center of each breast cup and being substantially parallel to said lines of fashioning marks, and

(d) biased band portions knit integral with and extending in opposite directions from said breast cups, said band portions extending downwardly at acute angles relative to said breast cups.

14. A full-fashioned brassiere blank according to claim 13 wherein said breast cups are knit throughout of thermoplastic yarn to permit the heat-setting of said breast cups, and wherein at least portions of said lower panels of each of said breast cups include a reinforcing

yarn knit in plated relationship with said thermoplastic yarn to provide additional support.

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WM. CARTER REYNOLDS, Primary Examiner

U.S. Cl. X.R.

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