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3,103,111

BODY BULGE RECEIVING CUP AND METHOD OF MAKING SAME

Filed June 7, 1962

3 Sheets-Sheet 1

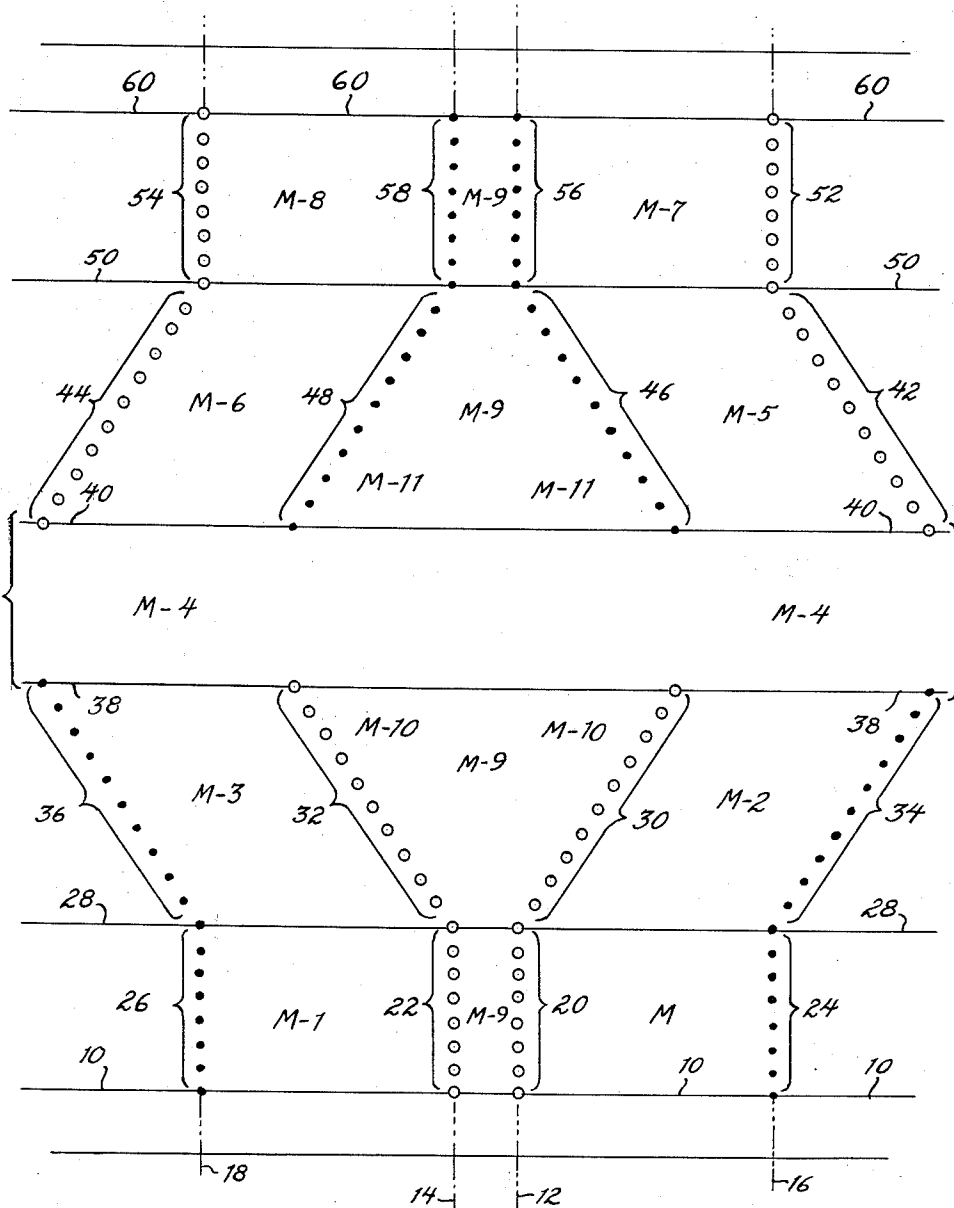


Fig. 1.

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3 Sheets-Sheet 2

Fig. 2.

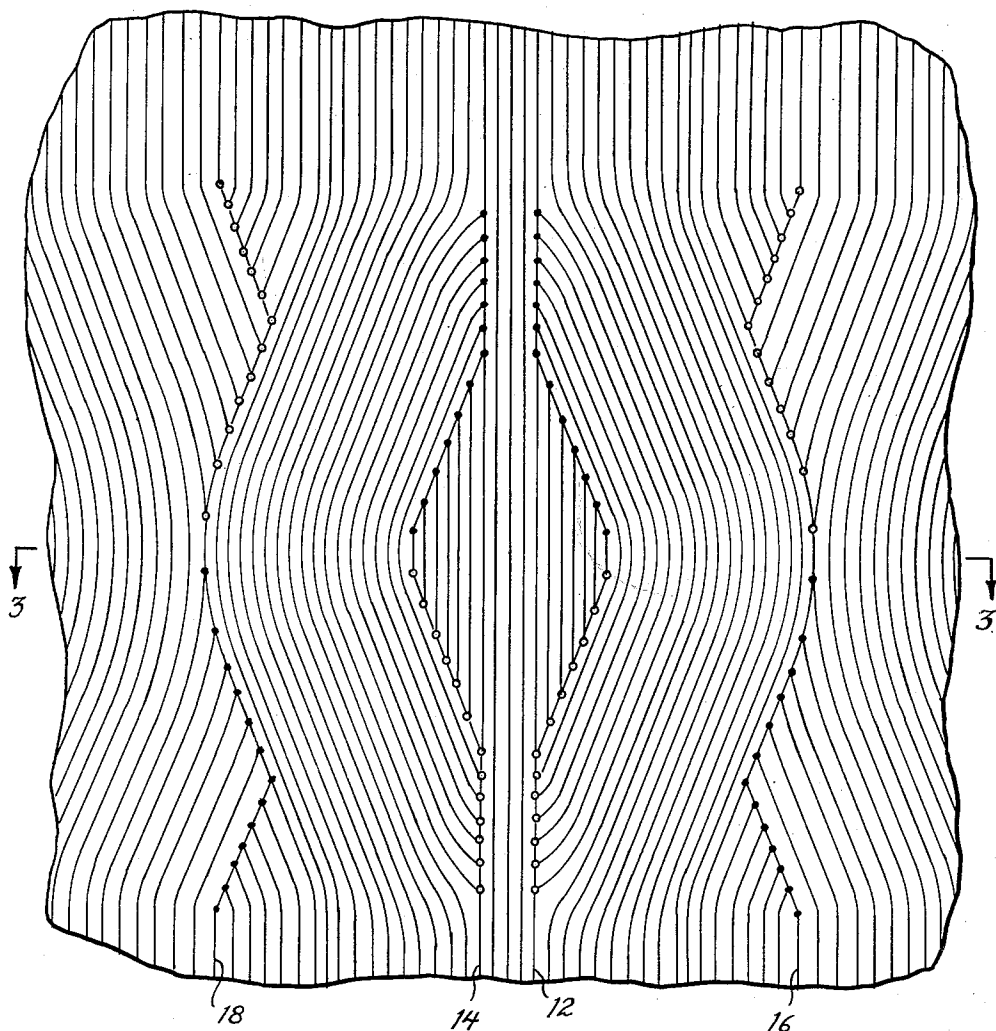
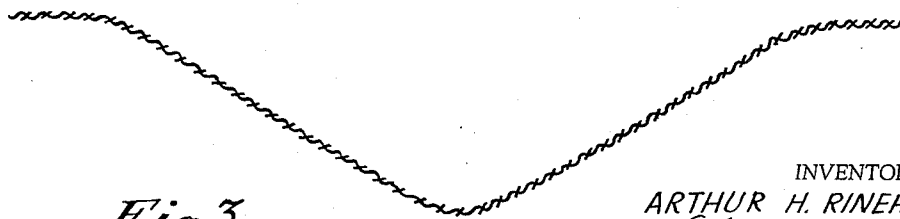


Fig. 3.



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3 Sheets-Sheet 3

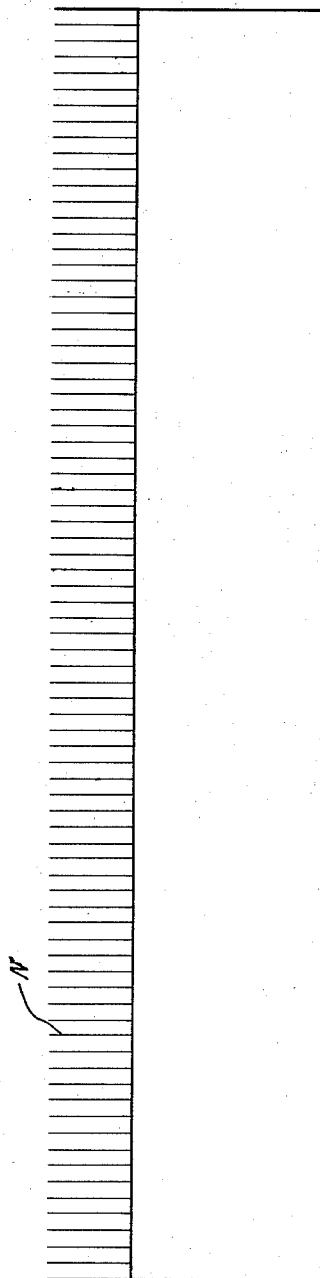
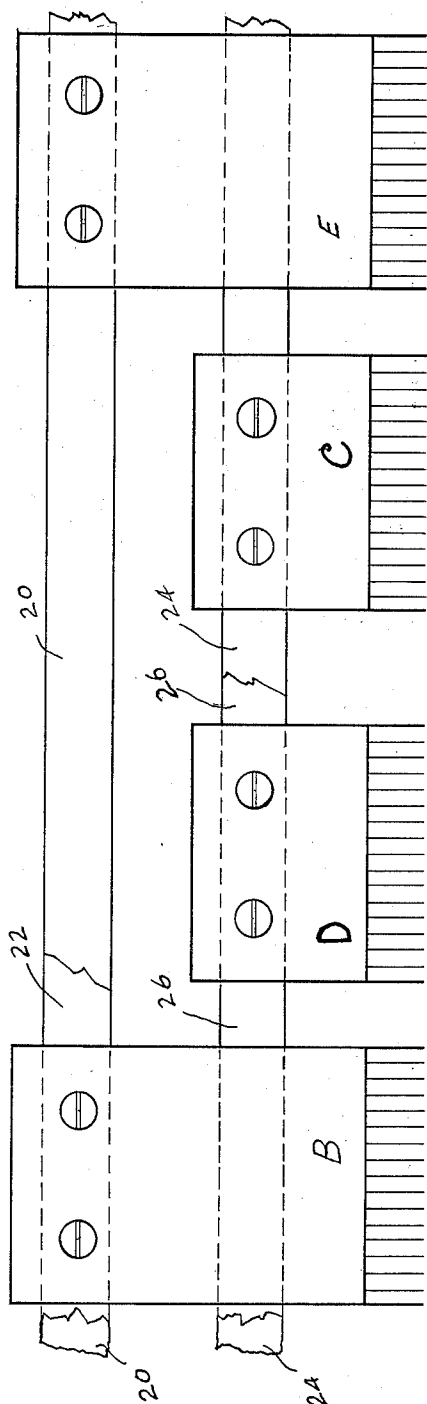


FIG. 4

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1

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BODY BULGE RECEIVING CUP AND METHOD OF MAKING SAME

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4 Claims. (Cl. 66—176)

This invention relates to a jersey knit ladies' swim suit, or other garment, having integrally knit pockets, or cups, for receiving body bulges, such as the breasts and buttocks.

One object of this invention is to produce an improved swim suit, or other garment, of the type set forth.

Crawford Patent No. 2,977,783 disclosed a swim suit having integrally knit breast receiving cups, each of which is formed by transferring stitches inwardly from the selvedge, and by transferring stitches outwardly from the center of the front panel of the suit in the area above the horizontal center line of the breast, or cup, and by transferring stitches outwardly toward the selvedge only in the area below the horizontal center line of the breast or cup.

A breast cup so produced is a great improvement over a flat knit front panel which is bulged out by the pressure exerted by the breasts, but such a cup will be asymmetrical with reference to its horizontal and its vertical axes. This means that the cup is not fashioned over its entire area and will distort or will be distorted by the breast enclosed thereby.

It is therefore a further object of the invention to produce a breast, or buttock receiving cup which is symmetrical about its coordinate axes and to produce an improved method of knitting such cup so as to provide better support for the bulge with less strain on the bulge and on the cup and to improve the appearance of the figure of the person wearing the garment.

The full nature of the invention will be understood from the following specification and the drawings in which:

FIG. 1 is a highly diagrammatic view showing the order and directions in which stitches are transferred to produce a fully symmetrical body bulge receiving cup embodying the invention.

FIG. 2 is a diagrammatic front elevational view showing the general appearance of the cup produced by transferring stitches as shown in FIG. 1, it being noted that the appearance of the wales is only approximate and not to scale.

FIG. 3 is a diagrammatic sectional view looking in the direction of line 3—3 on FIGURE 2.

FIG. 4 is a diagrammatic representation of the conventional fashioning fingers used in fashioning garments generally and used in carrying out the invention.

The attached model was actually produced by operating two of the fashioning fingers of FIG. 4 to transfer in the order and in the directions shown in FIG. 1 and is to be considered as part of the disclosure, the same as the drawings.

Since the operation of full fashioned, or flat bed knitting machines, including the processes of widening and narrowing, are old and well known, they are not shown nor described. It is sufficient for the purpose of this disclosure to say that the invention can be carried out on a "Cotton" knitting machine of the type disclosed in Patent 1,978,454; that the fashioning fingers are conventional and are provided with "Cotton" points and that the needle bar is also conventional and in provided with "Cotton" type needles N. Likewise, since the manner in which the fashioning fingers are activated by the coaction of buttons on the pattern chain and by cams on the cam drum, is also well known, it is not shown nor described. For further in-

2

formation, reference may be had to the Crawford patent above-mentioned and to other patents available in the United States Patent Office and well known to those skilled in the art.

In carrying out my invention, I use one pair of fashioning fingers, B and D, for fashioning the left, and another pair of fingers, C and E, for fashioning the right breast or buttock receiving cup. But, since the cups are formed in the identical manner, the process of fashioning only one cup, such as that formed by the coaction of fingers C and E, will be described.

Each of fingers B, D, C and E has about three inches of points and, for convenience, fingers D and C are mounted on round lace bars whereby they may be rotated out of the way when not needed, as, for example, when fingers B and E are operating at the selvages.

For the purpose of this disclosure, it is assumed that the portion of fabric below the bulge, such for example, as the lower portion of the front panel of the swim suit, has already been knit in any desired manner and that line 10 designates the point at which the formation of the breast, or buttock, cup is to begin. At this point, fingers C and E are racked in until they are about one half inch apart, the space between them being represented by lines 12 and 14 in FIGS. 1 and 2. Fingers C and E are then set in motion to transfer stitches outwardly from lines 12 and 14 to lines 16 and 18, thus producing rows of fashioning holes 20 and 22 and rows of fashioning marks 24 and 26. It will be noted that fingers C and E are brought back to their original position after each shifting operation and, therefore, the row of holes 20, 22 and the rows of marks 24 and 26 and the wales which extend between lines 10 and 28 should, in the absence of distortion, be parallel and vertical. The knitting thus far described produces lower central area M-9 and lower lateral areas M and M-1 which constitute the lower portion of the lower half of the cup. In practice, the tension produced by the transfers and the tension exerted by the surrounding fabric cause the wales in areas M and M-1 between lines 10 and 28 to diverge from the vertical center line as shown by the model and as diagrammatically illustrated in FIG. 2. The number of courses between lines 10 and 28 and the courses in which shifting takes place may be varied, as desired. In practice, I have produced a satisfactory, average size and average shape breast-receiving cup by knitting 20 courses between lines 10 and 28 and I have transferred stitches in every second course. Obviously, for a smaller breast, the number of courses will be reduced and, for a larger bulge, such as a buttock, the number of courses will be increased.

Above line 28, stitches are transferred outwardly of the vertical center line of the cup, but the fingers are not returned to their original positions after each transfer. This produces diverging rows of fashioning holes 30 and 32 and correspondingly diverging rows of fashioning points 34 and 36. This widens the cup by two stitches after transfer. Again, the number of transfer operations and the order of courses in which the outward shifting takes place can be varied, but, in the attached finished cup above referred to, I shifted fifteen times and limited the shifting to every fifth course. It will be noted that, in areas M-2 and M-3 between lines 28 and 38, the wales diverge outwardly from the center line of the cup. The knitting immediately above described produces an upper portion of the lower half of the cup which, in addition to areas M-2 and M-3, also produces diverging wales in areas M-10 on either side of intermediate area M-9.

Between lines 38 and 40, I knit a number of plain courses to produce a horizontal band or area M-4 which extends along the horizontal center line of the fabric. Again, the number of plain courses can be varied, but in the example given, I found that twelve plain courses

3

produce a satisfactory, average breast-receiving cup. Area M-4 constitutes the central, or dividing portion of the cup.

Above line 40, the process is reversed in that fingers C and E are operated to shift toward the vertical center line of the breast to form converging rows of fashioning holes 42 and 44, and correspondingly converging rows of fashioning points 46 and 48, the same as between lines 28 and 38. It will be noted that the wales in areas M-5 and M-6, between lines 40 and 50, converge toward the vertical center line. This forms a V and an inverted V, the bases of which are separated by plain course band M. It will also be noted that the limbs of the V and inverted V are prevented from intersecting by vertical, parallel, plain knit wales in area M-4 on either side of central wales M-9. The knitting between lines 40 and 50 produces areas M-5 and M-6 and areas M-11 on either side of central wales M-9 which constitute the intermediate portion of the upper half of the cup.

Above line 50, the fingers are returned to their original position after each shifting to produce parallel rows of fashioning holes 52 and 54 and rows of fashioning marks 56 and 58 to produce areas M-7 and M-8 which are mirror images of their counterparts below line 28. The knitting between lines 50 and 60 produces the upper portion of the upper half of the cup which comprises areas M-7 and M-8 and the continuation of area M-9. Above line 60, the plain knitting is resumed until the upper limit, not shown, of the garment is reached.

It will be noted that, in the areas M-10 and M-11 which are between fashioning holes 30 and 32 and between fashioning marks, as well as in horizontal area M-4 and in vertical area M-9, the wales are not distorted. In the areas outside rows 24, 34, 42 and 52 on one side and rows 26, 36, 44 and 54 on the other, the wales are curved, as generally shown in FIG. 2 and in the model.

While I have given one example of the number of courses and of the order of transfers which produce a satisfactory, average size breast-receiving cup, such as that shown in the model, the number of courses and the wale-wise distribution of the transfers and the number of the courses in which no transfer takes place can be altered to change the size and the shape of the resultant cup produced.

It will be noted that the number of courses and the order of transfers as shown in the drawings do not correspond to those recited in the description or to those shown in the model produced by the method described. In other words, the drawings are highly diagrammatic and are "working" drawings. This is particularly true of FIG. 2 which attempts to reproduce the appearance of the finished cup, but which, due to the difficulty of showing the very fine wales, is necessarily only approximate.

The non-widening transfer in areas M and M-1 produces a gradual rise or bulge which corresponds to the gradual rise of a body bulge, such as a breast relative to the torso, or a buttock relative to the surface of the thigh therebelow, while areas M-7 and M-8 serve to graduate the reverse slope from the maximum bulge toward its base. This makes it possible to progress gradually from a substantially flat base to, and from, the central portion of the bulge without wrinkles and, as will be seen from the model, areas M and M-1 and M-7 and M-8 greatly enhance the appearance of the cup. It is well known that breasts and buttocks, vary as much in shape and orientation as they do in size. The pocket formed according to the Crawford patent provides room for the upper half of the breast and room and support for only the portion of the breast below the horizontal center line and to the outside of the vertical center line of the breast. This prevents the fabric between the vertical center lines of the breast cups and below the horizontal center line of the breasts from snugly hugging the inner lower portions of

4

the breasts and spreading the wales and opening the stitches and applying pressure against and distorting the breasts from their natural rest position. The absence of symmetrical fashioning below the center line makes the cup of Crawford unadaptable to the larger, generally firmer and more protruding buttock. Furthermore, areas M-4, M-9, M-10 and M-11 coact to produce a roomy high bulge which receives the high portion of breast or buttock.

As far as I am aware, no attempt has heretofore been made to fashion the buttock area of a swim suit or similar garment with result that suit was fashioned by the buttock instead of the suit supporting the buttock. For example, a rounded, high bulging, pushes the plain knit fabric outwardly, thus drawing the leg openings upwardly to a point where, in the interest of modesty and/or comfort, the wearer is compelled to pull the leg openings down fruitlessly and with annoying frequency. A low hanging buttock pulls the whole swim suit, especially the back panel, downwardly. In any case, this produces discomfort and in the case of a back-less swim suit, this can be embarrassing. A cup constructed as above set forth provides room for a rounded, bulging buttock and affords upward support for a sagging buttock, thus providing comfort and enhancing the appearance.

In addition to producing the desired bulge, the plain knit area M-4 between lines 38 and 40 provides a buffer, or stabilizing effect. In other words, it provides a base for the fashioning below and above it, the same as the plain knit areas below line 10 and above line 60. In other words, if plain knit band M-4 is omitted, a "knife" edge instead of a well rounded contour will be produced. This will form a wrinkle along the horizontal center line instead of the rounded effect shown in FIG. 3 and in the model.

Likewise, the vertical rows of holes 20 and 22 and vertical rows of fashioning marks 56 and 58 and the straight wales in areas M-9 therebetween serve to keep the areas to either side thereof symmetrically rounded and they serve to delineate the center of the cup and accentuate its symmetry.

In the claims, the "vertical axis" is the line bisecting all of areas M-9 from top to bottom and the "horizontal axis" is the line bisecting area M-4 along its length.

I claim:

1. A knit garment having a generally rounded body bulge receiving cup which is symmetrical with reference to its vertical and horizontal axes, the lower half of said cup below said horizontal axis comprising

a bottom portion formed of

a first central area of substantial height and width and disposed along, and on opposite sides of, said vertical axis,

the wales in said first central area being free of transfers and disposed parallel to said vertical axis, and first lateral areas of the same height as, and disposed on opposite sides of, said first central area and of substantial width, horizontally considered, all of the transfers in each of said first lateral areas originating in the same wale and

the wales in said first lateral areas diverging upwardly away from said vertical axis,

said lower half of said cup also including an upper portion formed of a second central area which is, at least in part, a continuation of said first central area and the wales of which are parallel to said vertical axis,

and second lateral areas which are continuations of said first lateral areas and the wales of which also diverge upwardly from said vertical axis,

the transfers in each of said second lateral areas originating in outwardly successive wales and the wales in said second areas converging downwardly towards said vertical axis,

said cup also having an upper half which is an inverse mirror image of said lower half,

5

said cup also including a horizontal area of substantial width, vertically considered,
 said horizontal area being disposed along, and on opposite side of said horizontal axis and joining said upper and lower halves of the cup,
 the wales in said horizontal area being parallel to said vertical axis and being continuations of the wales in the upper and lower halves of the cup.

2. The cup defined in claim 1 in which said second central area of each of the upper and lower halves of the cup is of a triangular shape, with the base of the triangle wider than said first central area, and with apex of the triangle of the same width as, and registering with, said first central area.

3. A ladies' garment having an integral body bulge receiving cup which is symmetrical with reference to its vertical and horizontal axes,

said cup including a vertical area of substantial width and coextensive with said body bulge, vertically considered, the wales in said vertical area being parallel to, and disposed on opposite sides of, said vertical axis,

a horizontal area of substantial width, vertically considered, and coextensive with the width of said bulge, horizontally considered, said horizontal area being disposed on opposite sides of said horizontal axis, and the wales thereof being parallel to said vertical axis,

first upper and lower lateral areas on opposite sides of said vertical area and on opposite sides of said horizontal area, the stitches of said lower lateral areas being transferred from outwardly successive wales whereby the wales in said lower areas diverge upwardly from said vertical axis and the stitches of said upper lateral areas being transferred from outwardly successive wales whereby the wales in said upper areas diverge downwardly toward said vertical axis,

second lateral lower areas being disposed on opposite sides of said vertical area and coextensive with the lower edges of said first lower areas, the stitches in said second lower lateral areas being transferred outwardly of said vertical axis from the same wale whereby the wales in said second lower areas diverge upwardly from said vertical axis, and

second, lateral upper areas being disposed on opposite sides of said vertical area and coextensive with the upper edges of said first upper areas, the stitches in said second upper lateral areas being transferred inwardly from the same wale whereby the wales in said second upper areas diverge downwardly from said vertical axis.

4. The method of knitting a garment which includes a body bulge receiving cup which is symmetrical with

6

reference to its vertical and horizontal axes, said method including

knitting the garment fabric until the lower border of said cup is reached,

continuing the knitting and while so knitting, outwardly transferring a relatively large number of stitches in each of a first, relatively large number of courses on opposite sides of said vertical axis,

beginning the transfers in all courses on one side of said vertical axis in one wale which is parallel to said vertical axis and which is substantially spaced therefrom,

beginning the transfers on the opposite side of said vertical axis in one wale which is parallel to said vertical axis and substantially equally spaced therefrom,

continuing the knitting and, while so knitting, outwardly transferring a substantially equal number of stitches in a second, relatively large number of courses on opposite sides of said vertical axis,

beginning successive transfers in said second number of courses in wales which are progressively further away from the opposite sides of said vertical axes to produce an inner V-shaped fashioning mark formation and an outer V-shaped formation of fashioning points, the limbs of which are spaced from, and parallel to, the limbs of said inner V-shaped formation,

knitting a horizontal area which is of substantial width, vertically considered, and which is disposed on opposite sides of said horizontal axis and which extends across the adjacent edges of the areas enclosed by the limbs of said inner and outer V-shaped formations,

the wales in said horizontal area and in the area enclosed by said inner V-shaped formation being free of transfers and parallel to said vertical axis, continuing the knitting, and, while so knitting, transferring stitches in the reverse order until the upper border of said cup is reached.

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