

Oct. 15, 1957

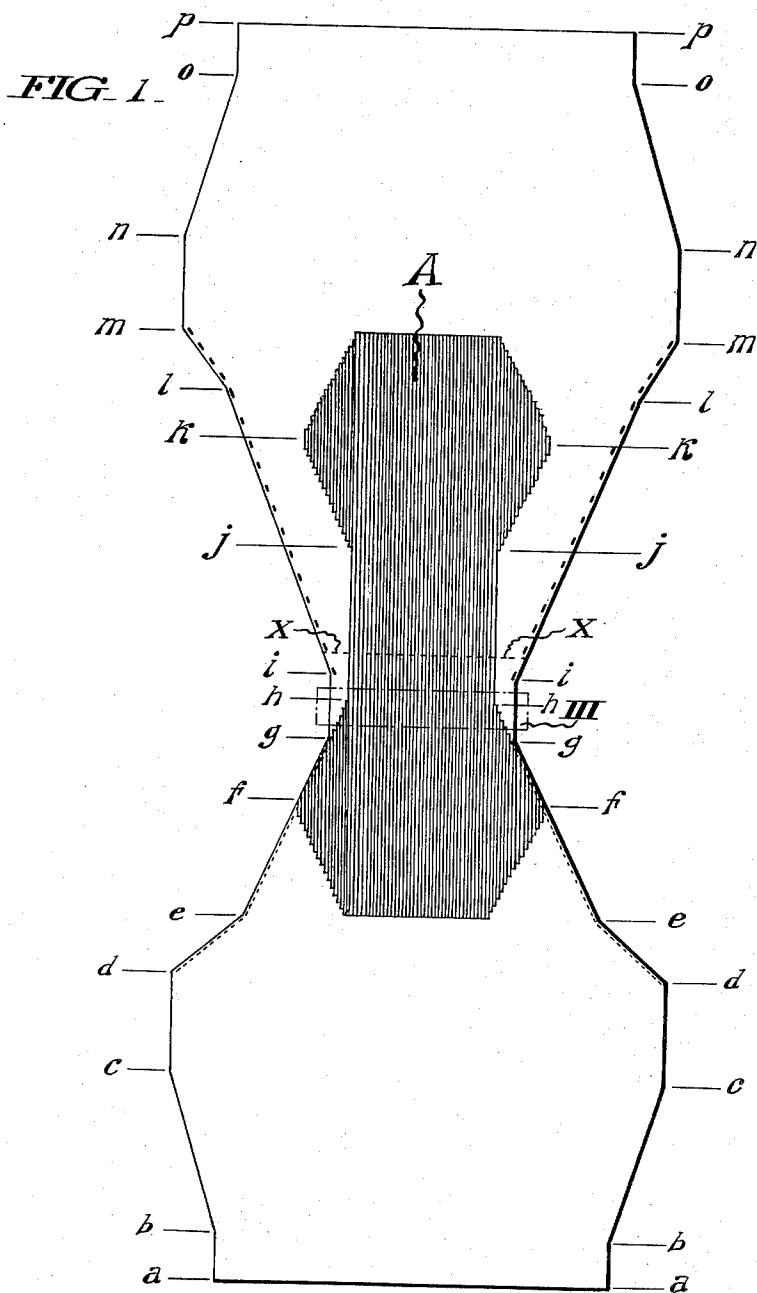
H. K. WEST

2,809,510

REINFORCED KNITTED FABRIC

Filed Jan. 24, 1955

3 Sheets-Sheet 1



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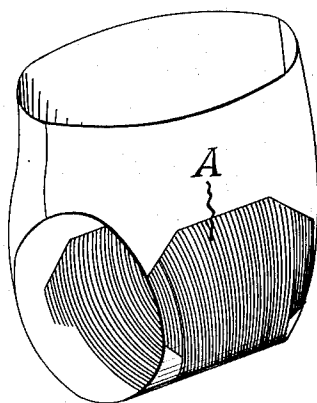
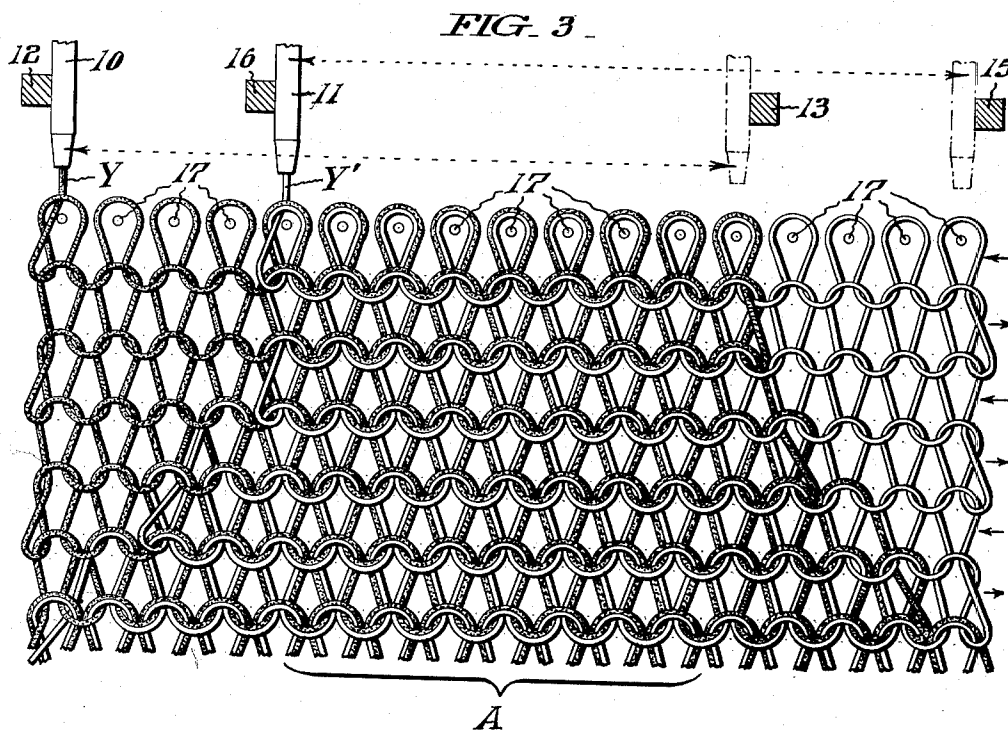


FIG. 2



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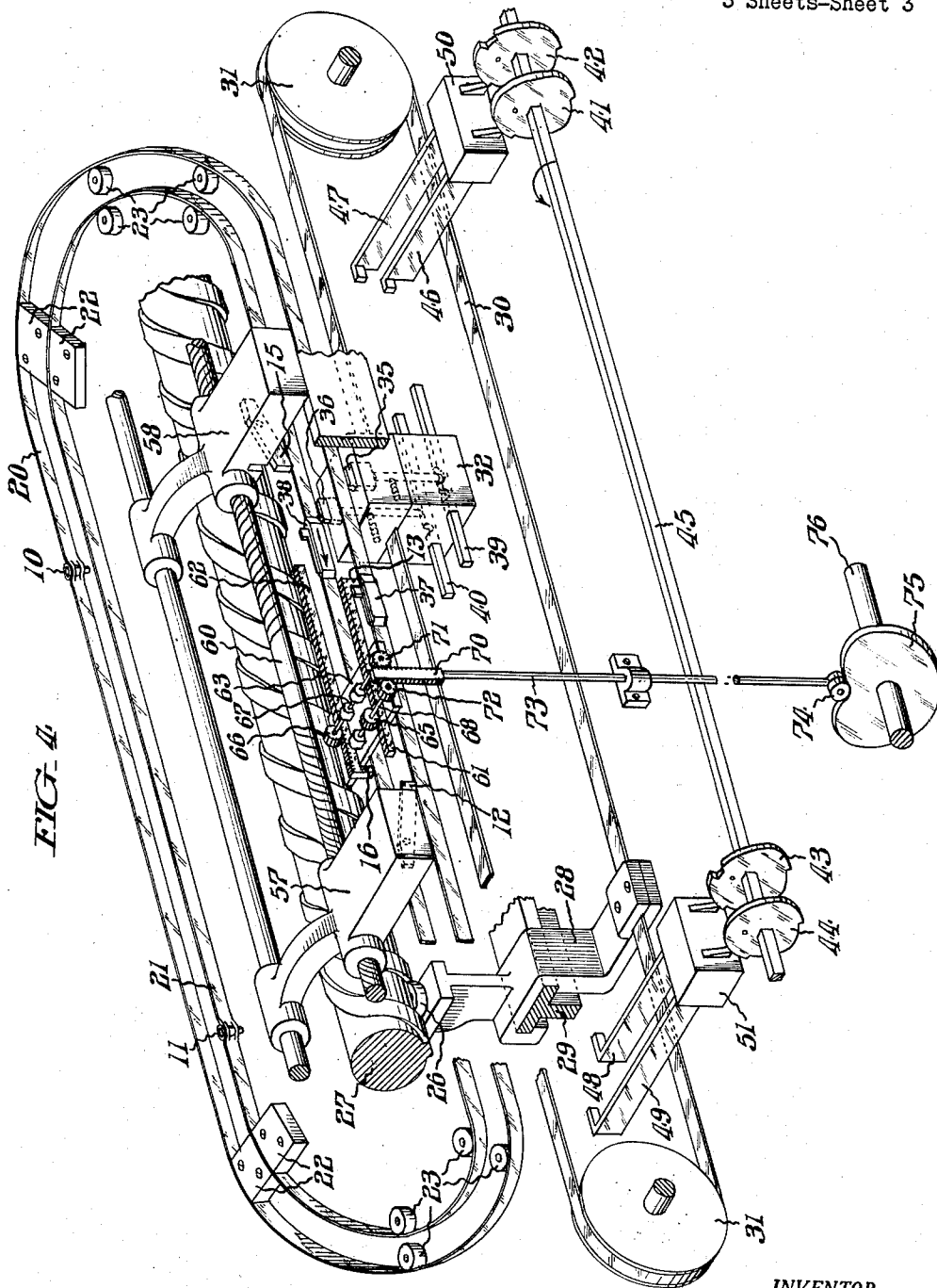


FIG. 4

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Application January 24, 1955, Serial No. 483,696

2 Claims. (Cl. 66-177)

This invention relates to reinforced knitted fabrics and to methods of producing such fabrics.

My invention is directed toward the provision of an improved flat knitted selvage edged fabric suitable for conversion into an undergarment of the trunk or pantie type having a reinforced infield area, which fabric can be economically produced commercially in quantity on standard types of knitting machines without requiring any radical structural changes in the machines.

Heretofore, fabrics so reinforced were ordinarily produced by employing one yarn to feed a main or body yarn to form complete courses from one selvage of the fabric to the other, while the reinforcing yarn delivered by a second carrier limited to a shorter traverse was fed to an intermediate group only of the needles of the knitting machine.

As hereinafter more fully disclosed, my improved fabric is produced likewise by use of two carriers in the knitting, but by differently controlling the traverse of the two carriers, i. e. by controlling them in such manner that their yarns are fed respectively to opposite end groups of the needles and due to overlap in the traverse of the carriers, both yarns are fed to the intervening needles to form the reinforced infield area.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein:

Fig. 1 shows a flat knitted fabric in the form of a blank for an undergarment of the trunk type having an infield area reinforced in accordance with my improved method.

Fig. 2 is a perspective view of the finished garment formed from the blank of Fig. 1.

Fig. 3 is a diagrammatic view showing a portion of the fabric within the confines of the broken line rectangle III in Fig. 1; and

Fig. 4 is a fragmentary broken out diagrammatic view in perspective of a portion of a typical straight knitting machine, as seen from the rear, with yarn carrier stop means arranged to serve the purposes of my invention.

The blank exemplified in Fig. 1 is flat knitted and fashioned by widening and narrowing that, upon being folded along the transverse line X—X and seaming together the corresponding coinciding opposite selvage edge portions *a, b, c, d* and *m, n, o, p*, will result in an undergarment of the trunk type such as shown in Fig. 2. The portion of the blank from the starting course *a—a* to the course *e—e*, and from the course *m—m* to the terminal course *p—p* is knitted from one yarn, while the medial portion of the blank between the course *e—e* and the course *m—m* containing the infield reinforced infield area A (with the formation of which my invention is more especially concerned) is produced from two yarns, the feeding of which is controlled after the manner shown in Fig. 3. In this illustration, the two yarns designated Y and Y' are fed from separate carriers 10 and 11 respectively, the traverse of the carrier 10 being limited by stops 12 and 13 and the traverse of the carrier 11 being limited by stops 15 and 16, said stops being so positioned relatively

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that the respective carriers move inward from opposite selvages of the fabric with incidental overlap of their traverse. Accordingly, both yarns are fed to a central group of the needles 17 of the knitting machine with consequent reinforcement of the infield area A in Figs. 1 and 2. During the knitting from course *e—e* to the course *g—g* in Fig. 1, the outer stops 12 and 15 are progressively moved toward each other to gradually shorten the outward traverse of the carriers 10 and 11, while between the course *e—e* and *f—f*, the inner stops 13 and 16 are progressively moved outward relative to each other for gradual increase in the overlap traverse of the carriers. During the knitting of the narrow parallel medial portion of the blank from the course *g—g*, to the course *i—i*, the outer stops 12 and 15 are held stationary to produce the parallel edged mid portion of the reinforced area A, while the inner stops 13 and 15 are progressively moved toward each other to the course *h—h* and then held stationary to the course *j—j*. From the course *j—j*, the inner stops 13 and 16 are progressively moved away from each other to the course *k—k* and then progressively moved toward each other to the course *m—m*, with resultant shaping the upper portion of the selvage line-defined reinforced infield area A as shown. Thus, in the knitting of the reinforced portion of the blank, the yarns Y and Y' are fed respectively to groups of the needles at opposite ends of the series 17 and both fed to the needles intermediate said end groups. After the course *m—m*, the remainder of the blank may be knitted from one of the yarns Y or Y', or it may be knitted from a third yarn if desired or found more convenient. It is to be understood that the yarns Y and Y' used, are ordinarily of the same kind and count, one of them having been stippled in Fig. 3 merely for the purpose of differentiating it from the other.

The knitting machine, partially shown in Fig. 4 is generally of the construction disclosed in U. S. Patents Nos. 1,982,991 and 1,989,232 both granted to Kenneth Howie respectively on December 4, 1934 and January 29, 1935. Two of its several usual endless yarn carrier bands of the machine are designated 20 and 21 and may be regarded as provided respectively with yarn feeds 10 and 11 hereinbefore referred to. By a system of guide blocks 22 and rollers 23, the yarn carrier bands 20 and 21 are constrained to move in a flat-sided elliptical path in a horizontal plane. Through a follower roller 26, the rotatably reciprocated screw 27 imparts reciprocatory movement to the usual slur cock carrier 28 which is slidingly engaged with a horizontal frame bar 29 of the machine and clamped to the lower run of the endless belt 30 trained about horizontal axis supporting wheels 31. The usual driver block 32 affixed to the upper run of the belt 30, carries the pawls 35 and 36 for engaging the dogs 37 and 38 respectively on the yarn carrier bands 20 and 21 to impart reciprocatory movement to the latter, said pawls being separately operable, as in Patent 1,982,991, by slides 39 and 40 in the lower part of said driver block. Selection between the yarn carriers is controlled by pairs of selector cams 41, 42 and 43, 44 which are secured to an intermittently rotated shaft 45 said cams serving to actuate selector plates 46, 47 and 48, 49 which are slidable in fixed portions 50 and 51 of the machine frame for projection of their distal ends into the paths of the slides 39 and 40 in the driver block 32. Outward movement of the yarn carriers is limited by engagement of upward projections of the dogs 37 and 38 with the stops 12 and 15 hereinbefore referred to which are pivotally supported in followers 57 and 58 respectively engaged with the oppositely threaded end portions of the Pointex spindle 60 of the machine. The inward movement of the carriers is limited by engagement of the upward projections of the dogs 37 and 38 with the stops 13 and 16 hereinbefore referred to formed by pendent lugs on rack

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bars 61 and 62 which are guided for endwise sliding movement in a fixed frame member 63 of the machine. The rack bars 61 and 62 mesh respectively with pinions 65 and 66 on a pair of transversely arranged shafts 67 and 68 rotatively supported in bearings on the frame member 63. A vertically-arranged rack bar 70 in mesh with pinions 71 and 72 at the rear ends of the shafts 67 and 68 is connected to a rod 73 having a roller 74 at the lower end thereof, said roller bearing upon the periphery of an actuating cam 75 affixed to an intermittently rotated shaft 76 in the lower portion of the machine at the rear. The means for drawing the screw shaft 27, and for intermittently rotating the Pointex spindle 60 in opposite directions to shift the stops 12 and 15 for limiting the outward shog of the two yarn carriers 10 and 11 during the reinforcing phase of the knitting may be like those disclosed in the Howie patents, supra, and for this reason have not been illustrated in Fig. 4. For the same reason, the usual means for intermittently rotating the cam shafts 45 and 76 have been omitted from the drawing. The actual change made in the machine for the purposes of my invention is in the arrangement of the racks 61 and 62 whereby the inward movement of the yarn carriers 10 and 11 is limited during the reinforcing phase of the knitting, said racks being reversely positioned relatively as compared to the corresponding elements in Patent 1,989,232.

My invention is not to be considered as limited to reinforcing infield areas in blanks for undergarments, since fabrics for other uses may be similarly formed with such infield reinforcement either for utilitarian purposes or for ornamentation.

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Having thus described my invention, I claim:

1. As a new product of manufacture, an elongate knitted selvaged panty blank having, respectively, progressively narrowed and widened end sections shaped to coincide, one with the other, when superposed upon folding the blank about a transverse medial line; and a reinforced infield area extending beyond opposite sides of the fold line partway into the end sections, said reinforced area being knitted from two yarns, the courses of one yarn extending from one side edge of the blank to a limit line spaced from the opposite side edge, and the courses of the other yarn extending from said opposite side edge of the blank to a limit line spaced from the first mentioned side edge with the loops of the respective yarn doubled in the interval between said limit lines, and the remaining portions of the end sections being knitted from one of the yarns only.

2. An undergarment formed from the fabric blank defined in claim 1.

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