Nov. 19, 1935. F. E. MORRIS ET AL 2,021,132

METHOD OF PRODUCING FIGURED KNIT FABRICS

Filed Oct. 17, 1931 2 Sheets-Sheet 1

FIG. I.

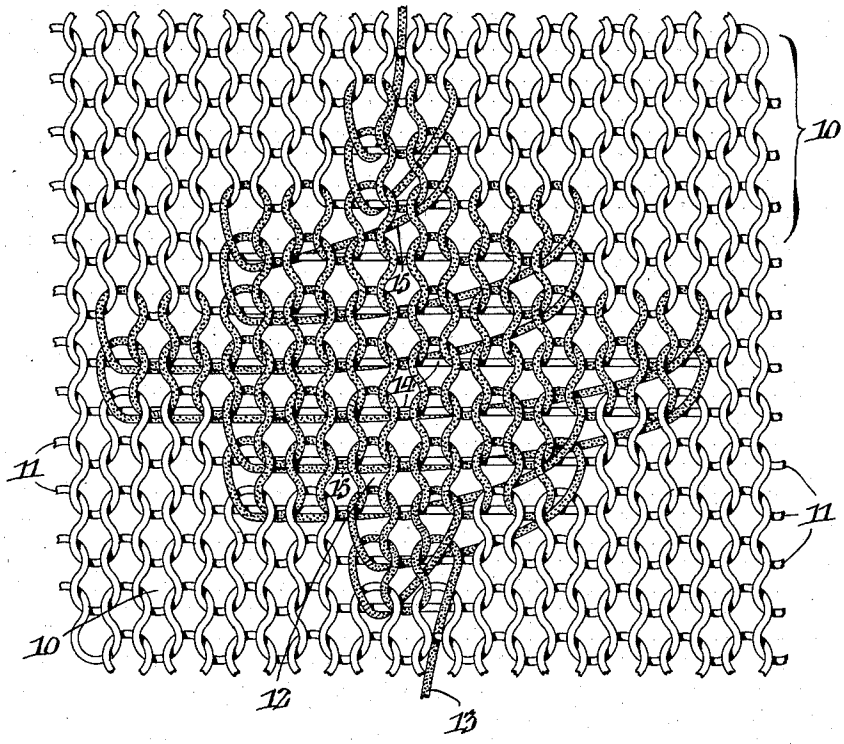
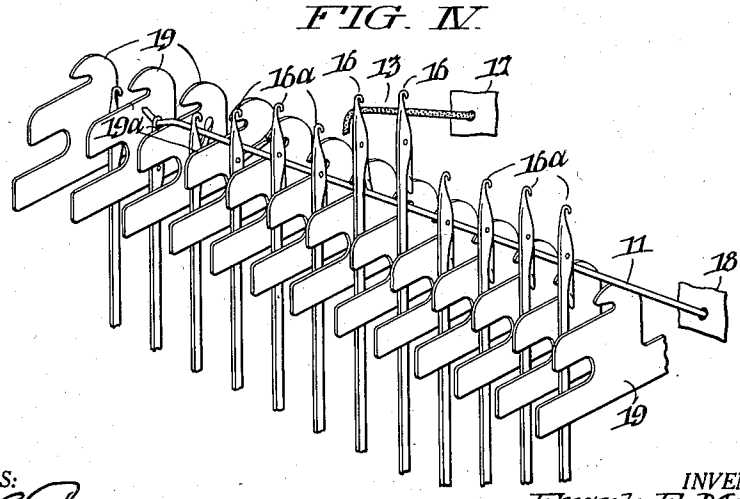


FIG. IV.



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Filed Oct. 17, 1931 2 Sheets-Sheet 2

FIG. II.

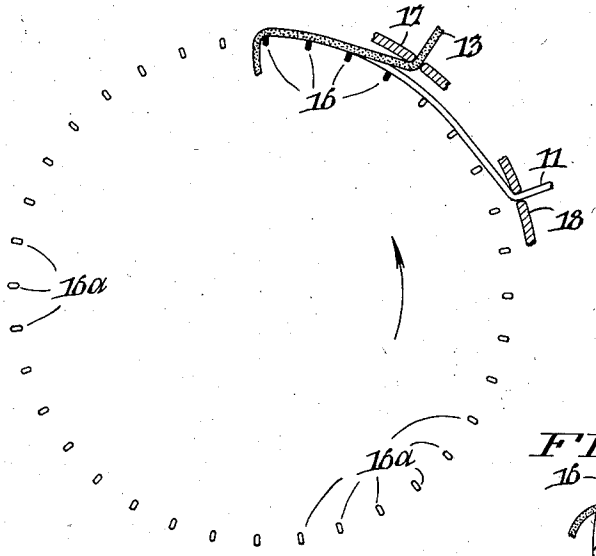


FIG. V

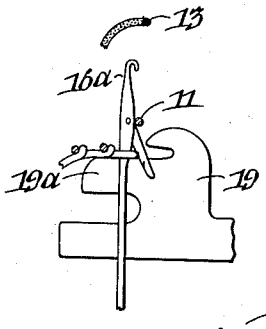


FIG. VI.

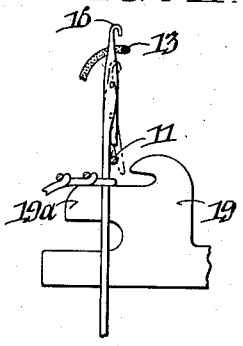
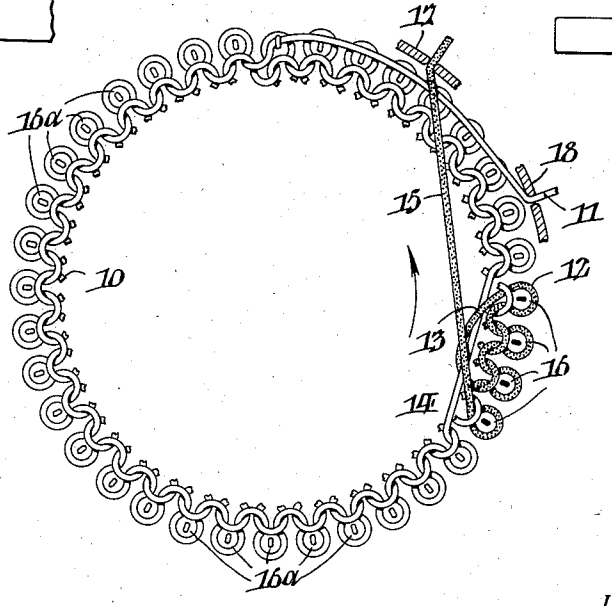


FIG. III.



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Patented Nov. 19, 1935

2,021,132

UNITED STATES PATENT OFFICE

2,021,132

METHOD OF PRODUCING FIGURED KNIT FABRICS

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Application October 17, 1931, Serial No. 569,366

2 Claims. (Cl. 66—201)

This invention relates to figured knit fabrics, as well as to methods of producing such fabrics. More particularly, it has reference to knit fabrics for hosiery, with clocks or like ornamentations, produced as a consequence of use in the knitting of two contrastingly colored or otherwise physically differentiated yarns, as distinguished from knitted fabrics in which the ornamentation is produced by drop stitches, tuck stitches, or other so called "lace" stitches.

Heretofore, fabrics of the kind specifically referred to, were produced in three ways, to wit:

(A) By simultaneously feeding two different yarns to the needles of a knitting machine in plaiting relation, and reversing the position of the yarns in the hooks of selected patterning needles.

(B) By simultaneously feeding two different yarns to the needles, but preventing the needles selected to produce the ornamentation, from taking one of the yarns, as a consequence of which the said yarn is floated behind the loops formed from the other yarn.

(C) By knitting the fabric on all the needles with one yarn, and plaiting with the other yarn on selected needles to produce the ornamentation.

Fabrics knit under the methods (A) and (B) are essentially of double thickness, and therefore objectionable if lightness, as regards weight, is essential or desirable. Moreover, in the case of the fabric produced under method (A) it is impossible to secure ornamental figures of solid color, since, in the ornamented areas, both yarns are interlooped with attendant muddling of the ornamentation due to overlap of colors after the manner characteristic of plaiting. The latter objection is also true of fabric produced under method (C), although such fabric is of a single thickness except over the ornamental areas.

Our invention is directed toward obviating the various objections pointed out in connection with figured knit fabrics made under the above methods. With this end in view, it is our aim to make possible the production of a single thickness figured fabric in which the body portion is knit solely from one yarn, while the ornamental areas are knit solely with the other yarn, with the consequent avoidance of overlapping of colors and of indefiniteness in the ornamentation.

As hereinafter fully set forth, through maintenance of a definite novel feeding relation between the two yarns employed in the knitting, our improved fabric lends itself to ready and rapid production on circular knitting machines equipped with latch needles.

In the drawings Fig. I shows a fragment of our improved fabric stretched somewhat to better illustrate the stitch formation and floats at the back thereof.

Figs. II and III are diagrammatic plan views of a circular knitting machine showing the needles and the feeds relied upon to serve the two yarns to the needles.

Figs. IV, V and VI are detail views showing the relation in which the two yarns are fed to the knitting needles.

Referring to Fig. I, the body portion 10 of our improved fabric is knit solely with a body yarn 11 which may, for example, be white, it being so indicated in the illustration. The ornamental area 12 of the fabric, which in this instance is of diamond configuration, is knit solely with a yarn 13, while the body yarn 11 is floated across the back of the said area. The yarn 13 may be either of different material from the yarn 11, or it may be contrastingly colored, as conventionally indicated in Fig. I. It is to be particularly noted that the fabric is characterized by absence of any doubling connection of the side edge loops at the wale junctures between the body portion 10 and the ornamental area 12 knit respectively with the yarns 11 and 13. In other words, the side border loops of the ornamental area 12 connect singly with corresponding border loops in the "skips" defined by the body portion 10. The ornamental area 12 is accordingly of solid color characterized by wales of variant length, and therefore sharply set off in contrast to the body portion 10 of the fabric, the floating strands of the yarn 11 across the "skips" at the back of the fabric being entirely hidden from view. The particular design of the ornamentation shown for convenience of illustration herein is determined by feeding the yarn 13 to two needles for two courses, then to an additional pair of needles to each side of the first pair, and so on until the maximum width of the figure is attained, whereupon the procedure is reversed. For reasons later on explained, the yarn 13 is continuously floated, as at 15, between opposite ends of the segmental portions of the courses of the fabric produced by it.

Figured knit fabric having the above described characteristics may be readily and economically produced on a circular knitting machine with latched needles after the manner illustrated in Figs. II, IV, V and VI. In this connection let it be assumed that the machine is fitted with suit-

able mechanism of any known sort capable of elevating selected needles, as instanced by the shaded needles at 16 in Figs. II and III, in progressively varying numbers incident to knitting of successive courses of the fabric, above the remaining needles in the circular series, which latter are shown in white and designated by the reference character 16a in Figs. II and III. At 17 we have shown a guide for serving the yarn 13 into the hooks of the raised needles 16, and, at 18, a guide for serving the yarn 11 to the needles 16a. As delineated in Figs. II, III and IV, the guide 18 is disposed well to the rear of the guide 17 with regard to the direction of rotation of the machine, and at a much lower level, thereby to insure that the yarn 11 is laid substantially horizontal on the ledges 19a of the web holders 19 and at a level below the latches of the raised needles 16. Thus, as the needles 16 descend to the stitch forming level, their latches are closed by the yarn 11 over the yarn 13 fed into their hooks by the feed 17, while the yarn 11 is missed by the said needles 16 and ultimately floated across the loops formed with the yarn 13, at the back of the fabric as shown in Fig. I. Incident to continued rotation of the machine, the yarn 13 is of necessity wrapped again and again about the raised needles 16 and therefore obliquely floated between the ends of the segmental portions of the loop courses in the ornamental figured area 12 knit by it, also as shown in Fig. I.

The ornamentation is of course susceptible to extensive variation in practice as will be readily appreciated by those conversant in the knitting arts, and we therefore do not consider ourselves limited to the specific species of design herein exemplified. Our invention is moreover not to be construed as restricted to a single figure, since, by duplication of yarn feeds, the same or different figures may obviously be produced in multiple crosswise of, or around the fabric.

Having thus described our invention, we claim:

1. A plain knit fabric comprising a main web knit from a body yarn and having an ornamentally configured area with float skips of the body yarn across varying numbers of wales in successive courses of the fabric; and a plain knit fill-in web completely closing the ornamentally configured area, formed from contrasting yarn, said main and fill-in webs being connected only by interloopment of contiguous loops of the two yarns at the edges of the ornamentally configured area, and the contrasting yarn being floated at the back of the fabric between opposite end loops of contiguous courses of the fill-in web.

2. The method of producing ornamented knit fabrics which comprises knitting a plain web from a body yarn with formation of float skips across varying numbers of wales in successive courses of the knitting; and concurrently closing the skips by knitting a fill-in web from a separate contrasting yarn in such manner that only contiguous edge loops of the two webs are interconnected, and the contrasting yarn is floated at the back of the fabric between opposite end loops of contiguous courses of said fill-in web.

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