

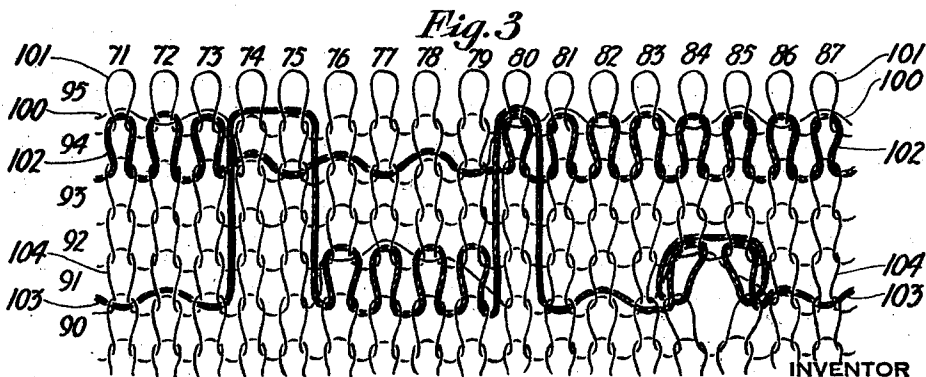
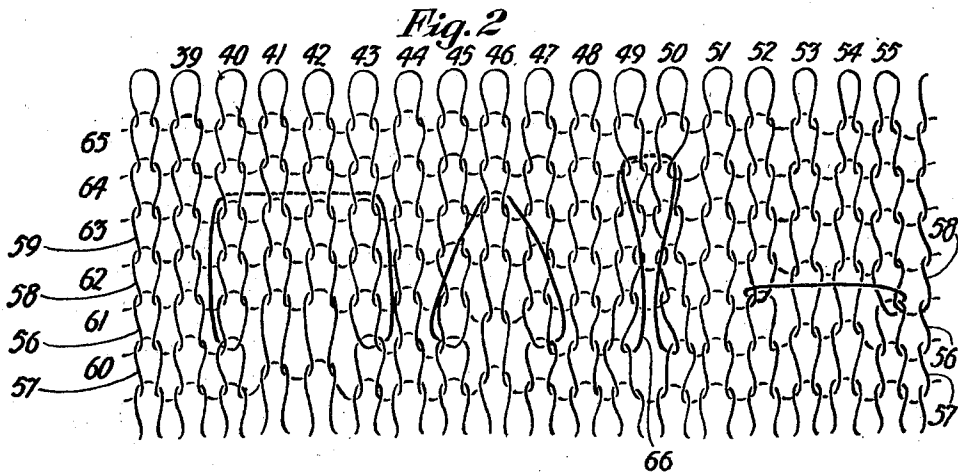
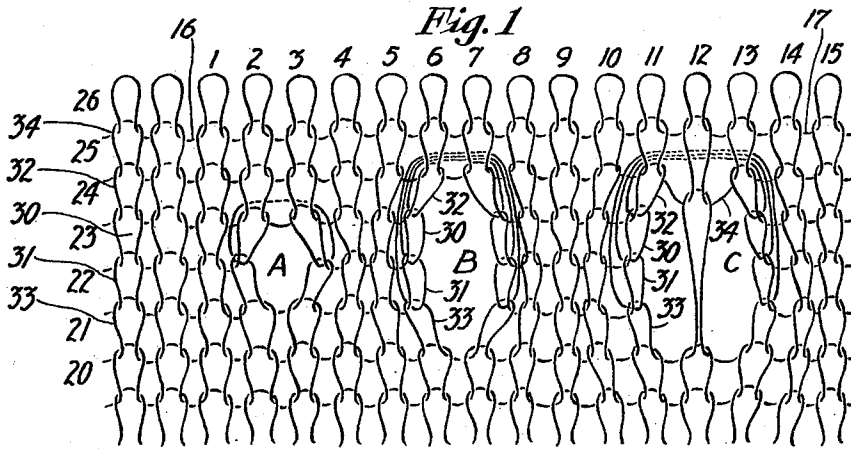
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KNITTED FABRIC

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## KNITTED FABRIC

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This invention relates to knitted fabrics and has for an object the provision in a knitted fabric of certain novel pattern effects of particular importance when yarns of different colors or sizes are employed.

These novel pattern effects may possess widely different forms as will be exemplified later and involve variations in the locations the usual connecting portions of the yarn between loops in adjacent wales of the fabric. Thus a connector for adjacent wales in one row may be carried in the front of the fabric for one or more subsequently knitted rows where it is then passed behind the fabric for one or more wales and then subsequently forming loops in the row in which the yarn was previously located.

For a better understanding of this invention reference is made to the following detailed description taken in connection with the accompanying drawing in which

Fig. 1 illustrates a form of this invention in a portion of a knitted fabric in which holes of various sizes appear in the fabric;

Fig. 2 illustrates another portion of the knitted fabric embodying another form of this invention in which certain yarn connectors between adjacent rows are removed to a different portion of the fabric but without the formation of gaps in the fabric as in Fig. 1; and

Fig. 3 illustrates the use of this invention in a portion of the knitted fabric of the interlock type.

It is to be understood that the three figures of the drawing may represent different portions of the same fabric if all specified pattern effects are desired in one fabric. The front of the fabric is shown in each figure and the knitting progresses from the bottom of each figure to the top.

The fabric of Fig. 1 is of the regular so called "jersey" type of fabric in which the yarn is knitted in a plurality of rows and wales except where the pattern effects of this invention are employed. Certain of the wales are consecutively numbered 1 to 15 while certain of the rows are consecutively numbered 20 to 26. As a preliminary explanation, it will be noted that the short portions of the yarns between the wales will be termed "connectors" herein. Thus the portion of yarn 17 between wales 14 and 15 is a connector as well as portion 16 to the left of wale 1. We shall first consider yarn 30 which forms loops in wales 1 and 2. After wale 2, the yarn 30 instead of passing directly over to wale 3 to form a connection to tie these two wales together in row 23 as in the usual knitting, the said yarn after passing under the top of the loop in wale 2 row

22 comes to the front of the fabric and extends along parallel to the wales of subsequently formed rows and on top of a connector between wales 1 and 2 until it reaches row 24 where it passes behind the loops in wales 2 and 3 row 24. Yarn 30 then reappears in front of the fabric and extends in front of a connector between wales 3 and 4 until row 22 is reached again, whereupon it forms a loop in wale 3 and subsequent wales. The absence of the connector between the loops in wales 2 and 3 causes the loops to spread apart to form an oval shaped opening A in the fabric. No yarns extend across the opening nor is there unknitted yarn lying around the edge of the opening to mar the effect. Such an opening may be similarly made in any other portion of the fabric to give a desired pattern effect. It will be noted that yarn 30 in effect doubles back on itself when it appears between wales 1 and 2, after forming a loop in row 23. Between wales 6 and 7 three connectors are missing resulting in a longer opening B but of the same width as just described. Yarn 31 after forming a loop in wale 6 passes under the top of the loop in wale 6 row 21 and then extends along the front of the fabric parallel to wale 6 until it passes behind the loops in wales 6 and 7 row 25. Yarn 31 then returns on the front of the fabric until it reaches row 22, whereupon it forms a loop in wale 7 and subsequent wales. It should be noted that yarn 31, as in opening A, after forming a loop in row 22 doubles back on itself and appears along the connectors between wales 5 and 6 instead of appearing along the right side of wale 6 where its presence would detract from the finished appearance of opening B. Yarn 30 also fails to act as a connector between wales 6 and 7 but follows yarn 31 in the front of the fabric, then behind loops in wales 6 and 7 row 25, and then along the front of the fabric again until it forms a loop in wale 7 and subsequent wales. It will be also apparent that yarn 32 follows a path corresponding to yarns 30 and 31. Yarns 30, 31 and 32 therefore fail to provide connectors between wales 6 and 7 in the usual manner so that an elongated opening in the fabric results at that point, but the opening is not one which will cause the fabric to unravel or which will decrease the strength of the fabric.

In opening B the yarns 30, 31, and 32 formed the regular number of loops in the wales adjacent thereto so that the opening is not due to the absence of any loops. In opening C however, certain loops are missing as well as connectors. Yarn 31 after forming a loop in wale 11 passes

up between wales 10 and 11 in the front of the fabric until row 25 is reached where it passes behind the loops in wales 11, 12 and 13, after which it extends down the front of the fabric until row 22 is reached where it forms a loop in wale 13 but not in wale 12. Yarn 30 after forming a loop in wale 11 follows yarn 31 to row 25 where it also passes behind the loops in wales 11, 12 and 13, and thereafter returns to row 22 where it forms a loop in wale 13 but not in wale 12. Yarn 32 similarly passes behind the same loops in row 25 and subsequently forms a loop in wale 13 but not wale 12. In order to prevent any dangling loops in this opening C because of the path followed by yarns 30, 31 and 32, it will be noted that yarn 33 (the first yarn below yarn 31) forms a loop in wale 12 as well as adjacent wales and since the next yarn forming a loop in wale 12 is yarn 34, it follows that the loops of yarns 33 and 34 in wale 12 will be longer than usual, the one formed by yarn 33 being the longer. The opening C is therefore divided into two parts by the loop of yarn 33.

It will be apparent that only one of the openings A, B, or C may be used in one fabric in a desired arrangement throughout the fabric or they may appear in various combinations.

Fig. 2 represents a variation of Fig. 1 in which, at a pattern point, only one yarn fails to act as a connector between wales and passes over or under subsequently formed loops while failing itself to form loops in one or more wales, but the arrangement is such that no opening appears in the fabric at the pattern point as in Fig. 1.

Yarn 56 after forming a loop in wale 40 passes under the top of the loop in row 60 and then appears in the front of the fabric running parallel to wale 40 on top of the connectors until it reaches row 64 where it passes to the rear of the fabric behind loops in wales 40 to 43 inclusive and then appears in front of the connectors between wales 43 and 44 until it reaches row 61 where it forms a loop in wale 43 and subsequent wales. The two vertical sections of yarn 56 at the described point therefore give the pattern effect. No opening of unusual size appears in the fabric because yarns 57, 58, and 59 in adjacent rows form loops in the specified wales to cover up the failure of yarn 56 to form loops in wales 41 and 42. This is accomplished by reason of the fact that certain of these loops particularly from yarns 57 and 58 are slightly over-size.

Yarn 56 subsequently forms an alternative type of pattern effect. This yarn 56 after forming a loop in wale 45 passes under the top of the loop in row 60 and then coming to the front of the fabric passes diagonally across wale 45 until it reaches row 64 where it goes under the loop in wale 46. Yarn 56 then appears on the front of the fabric and passes diagonally across wale 47 until it reaches row 61 where it forms a row in wale 47 and subsequent wales. The pattern effect at this point in the fabric is the two diagonal parts of yarn 56 which prominently appear in front of the regularly formed loops.

Another variation in the pattern effect is also produced by yarn 56 when after forming a loop in wale 49 it does not pass upwards over the connectors between wales 48 and 49 (as at wale 40) but appears in the front of the fabric to the right of wale 49 and continues substantially parallel to wale 49 until row 65 is reached where it passes behind the loops in wales 49 and 50; thence to the front of the fabric continuing downwards parallel to wale 50 until it reaches row 61 where

it forms a loop in wale 50 and subsequent wales. The pattern effect at this point consists of the two vertical portions of yarn 56 closely adjacent each other. In this last described pattern effect it is permissible to have yarn 56 to be on the right side of wale 49 since there is no opening between wales 49 and 50 similar to opening B which would be given an unfinished appearance by its presence.

Still another pattern effect is due to yarn 58 which after forming a loop in wale 52 passes under the top of the loop in row 52, wale 61, then appears in the front of the fabric and passes over its own loop in wale 52 parallel to row 62 until it reaches wale 55 where it forms a loop in row 62. It should be noted that yarn 58 also passes in front of its own loop in wale 55. This means that yarn 58 does not form loops in wales 53 and 54. The loops of yarns 56 and 57 in wales 53 and 54 are larger than usual so as to make up the deficiency. Yarn 58 at the described point therefore gives a pattern effect of a horizontal bar.

The various pattern effects of Fig. 2 may be used in any desired combination to produce what may be termed an embroidery effect.

Fig. 3 shows several adaptations of this invention as applied to fabric of the interlock type as disclosed in my U. S. Patent No. 1,426,576 issued August 22, 1922. As illustrating this interlock feature, yarn 101 forms loops in wales 71 to 78 while yarn 100 does not form loops in wales 71 to 73 but lies behind the fabric, being interlocked in alternate wales 71 and 73. After wale 73, yarn 100 passes to the front of the fabric and forms loops in wales 74, etc. in row 94. Yarn 102 forms loops in wales 71 to 73 but beginning with wale 74 it passes behind the fabric where it is interlocked in alternate wales, such as wales 75, 77, and 79. Beginning with wale 80, yarn 102 again appears in the front of the fabric in the form of loops.

The pattern effect in accordance with this invention is produced by yarn 103 which lies behind the fabric in wales 71 to 73 being interlocked in wales 71 and 73. After the interlock of yarn 103 in wale 73, the yarn 103 passes to the front of the fabric where it extends upwardly along the connectors between the wales 73 and 74 until it reaches row 95 where it passes behind the loops in wales 74 and 75 and then extends downwardly in front of the connectors between wales 75 and 76 until it reaches row 91 where it forms a loop in wale 76 and subsequent wales. The previous loops in row 91 and wales 71 to 75 were formed from yarn 104. Between wales 75 and 76 the yarn 104 passes behind the fabric and is interlocked in wales 77 and 79. It will be apparent that the pattern effect at the above described point is due to the two vertical portions of yarn 103 appearing in the front of the fabric.

The next pattern effect is also due to yarn 103 which after forming a loop in wale 79 and being caught in a loop in row 90 comes to the front of the fabric and proceeds on top the connectors between wales 79 and 80 until it reaches row 95 where it passes behind a loop in wale 80, and then appearing again in the front of the fabric, runs parallel to wale 80 between wales 80 and 81 until it reaches row 90 where it returns to the rear of the fabric to be interlocked between loop in row 90 and row 91 wale 81, passing entirely behind wale 82 and being interlocked again in wale 82. Yarn 103 therefore failed to make a regular loop

in wale 80 but the loop for that wale in row 90 is made by yarn 104 which is an interlocked yarn in the preceding wales 77 and 79. Yarn 104 also forms the regular loops in wale 81 and subsequent wales with yarn 103 interlocked in the back of the fabric.

Yarn 103 after being interlocked in wale 83 passes up through the loop in row 90 and forms a loop in wale 84. The yarn 103 then passes through the top of loop in row 90, thence to the front of the fabric to run along the connectors until it reaches row 92 where it passes behind the loops in wales 84 and 85. Yarn 103 then appears on the front of the fabric and forms a loop in row 91 wale 85, after which it passes to the rear of the fabric where it is interlocked in alternate wales such as in wale 87. The absence of a connector between the loops of yarn 103 in wales 84 and 85 forms an opening in the fabric as at the point A in Fig. 1. The loops in row 91, wales 86 and 87 are formed by yarn 104 which formed the loops in the said row before the two loops of yarn 103 were formed in the said row. This last described pattern effect may of course appear at various parts of the fabric in any desired combination with the other forms of the invention.

Yarns 102 and 103 are shown to be larger in size than the remaining yarns of Fig. 3. This difference in size is not essential but aids in bringing out the pattern. The yarns 102 and 103 may also be of a distinctive color different from the remaining yarns of the fabric. The same observation applies to Figs. 1 and 2 where the yarns may differ in color and size. Thus in Fig. 1 yarns 30 to 33 may be of a different color from the remaining yarns, while yarns 56 and 58 Fig. 2 may also be of a distinctive color. It is also to be understood that while for convenience the invention has been embodied in three figures these three figures may represent merely different portions of the same fabric.

While certain forms of this invention have been illustrated in the drawing, it is to be understood that the invention may have other embodiments as defined by the appended claims.

What is claimed is:

1. A knitted fabric comprising a plurality of

yarns knitted into loops in a plurality of rows and wales, said fabric comprising a yarn which after being incorporated in a certain row of the fabric for a plurality of wales appears in the front of the fabric and extends in a substantially straight path across the front of a plurality of said loops after which said one yarn is incorporated again in the said certain row of the fabric for a plurality of wales, said fabric in the region surrounding and including the portion over which said one yarn passes in its substantially straight path comprising closely knitted loops which are substantially uniformly distributed, said one yarn in its said straight path normally contacting with all of the loop portions over which said one yarn passes.

2. A knitted fabric in accordance with claim 1 in which said one yarn has a characteristic substantially different from that of the majority of the other yarns of said fabric.

3. A knitted fabric in accordance with claim 1 in which said one yarn in its substantially straight path extends across a plurality of wales parallel to said certain row, said one yarn forming front loops in said certain row on both sides of said substantially straight path portion.

4. A knitted fabric comprising in one portion yarn of one color formed into loops in a plurality of rows and wales and yarn of a second color for a certain part of its path interlocked in the rear of the fabric in alternate wales while being carried entirely behind the fabric in the intervening wales, said portion having an eyelet hole formed therein by displacement of a yarn connector between two adjacent wales, certain of the loops forming the outline for said eyelet comprising said first yarn, and certain other of the said last mentioned loops comprising said second color yarn which lies in the rear of the fabric in a wale adjacent a wale defining said eyelet.

5. A knitted fabric in accordance with claim 4 in which four loops form the outline for said eyelet, two of said loops being of said one color yarn and the other two loops being of said second color yarn.

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