

Sept. 25, 1923.

1,468,963

H. GROPPER

KNITTED FABRIC

Filed Feb. 2, 1923

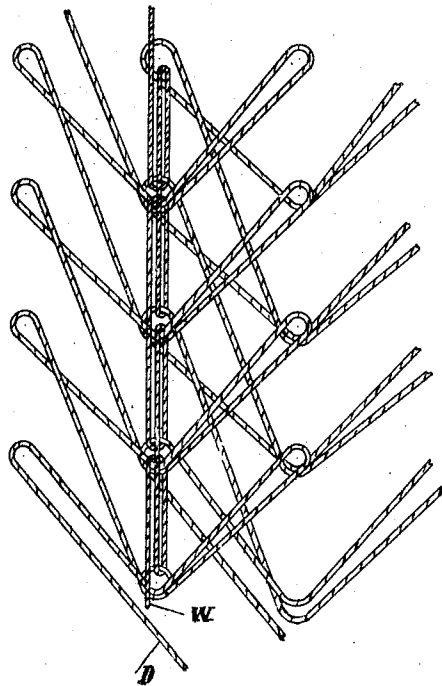


Fig. 5.

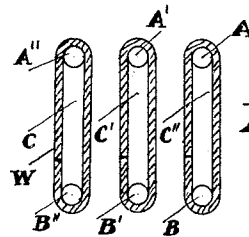


Fig. 1.

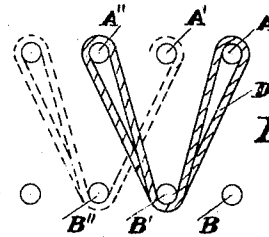


Fig. 2.

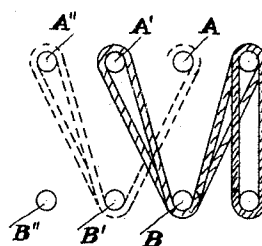


Fig. 3.

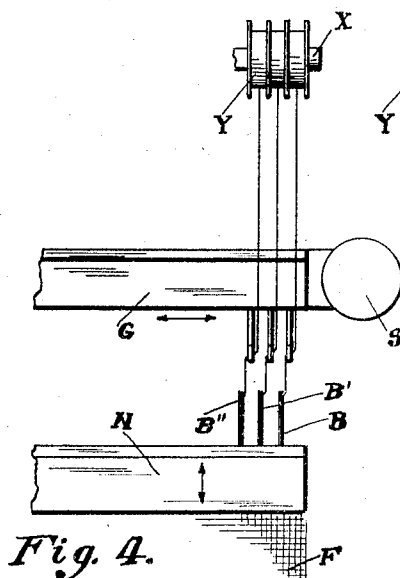


Fig. 4.

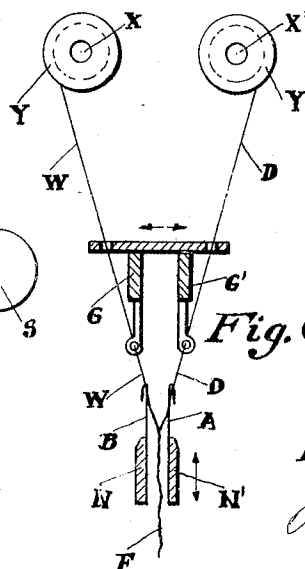


Fig. 6.

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# UNITED STATES PATENT OFFICE.

HARRY GROPPER, OF NEW YORK, N. Y.

KNITTED FABRIC.

Application filed February 2, 1923. Serial No. 616,471.

*To all whom it may concern:*

Be it known that I, HARRY GROPPER, a citizen of the United States, and a resident of the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Knitted Fabrics, of which the following is a description, reference being had to the accompanying drawing and to the reference figures shown.

My invention relates to new and useful improvements in knitted fabrics and the method or process of producing or manufacturing the same, and especially to a knitted fabric composed of a front and rear web portion.

An object of my invention is to provide a knitted fabric in which the web is extremely fine and which is especially adapted for use in ties and neckwear, so that the same will not readily stretch or pull out of shape.

A further object of my invention is to provide a knitted fabric in which the web is so fine that the manufactured article will have substantially the appearance of a weave or smooth goods, that is, the appearance of goods having a smooth surface as distinguished from a knitted surface.

A further object of my invention is to provide a knitted fabric by the use of only one warp or thread for each guide, and yet having a peculiar uniformity and being particularly free from floats.

A further object of my invention is to produce a knitted fabric of great strength and durability, having a front and rear web and having a low cost of manufacture.

Referring to the drawing, in which like letters refer to like parts in the several figures, Figure 1 is a diagrammatic plan view of one of the courses in my fabric, that is, a view looking at the end of the fabric, with one element of the stitch made around opposite latch needles. Figure 2 is a diagrammatic plan view of the second element in the stitch. Figure 3 is a diagrammatic plan view of the two elements of my stitch superimposed one upon the other to form a single course. Figure 4 is a diagrammatic front view of a knitting machine adapted to produce my fabric. Figure 5 is a diagrammatic vertical sectional view of the fabric in process of formation, and Figure 6 is a diagrammatic cross-sectional view of the knitting machine shown in Figure 4.

It is to be understood that the knitting machine herein shown forms no part of my present invention and is here shown only for the purpose of explaining the manner of forming the fabric. In the formation of the fabric I prefer to use a so-called warp knitting machine or Raschel machine, in which the usual two rows of needles and the usual two rows of guides are used and in which the needles are reciprocated vertically and the guides are reciprocated longitudinally of the rows of needles and are also given an oscillating movement to carry their thread guiding eyes across the lines of the rows of needles as shown and described in U. S. Patent to Curtiss No. 161,008, dated March 25, 1875.

Referring to Figures 4 and 6, X indicates the front, and X' the back warp beam which hold the threads of silk of various colors from which the fabric is produced. The spools or turns Y and Y' each show only one thread or warp W, or D, leading from it. In the formation of my fabric I use only one thread from each spool or turn and the thread W, or D, passes through the eye of one of the guides carried by the guide bar G, or G', which carries a series of these guides, G indicating the front one, and G' indicating the rear one of the two parallel guide bars.

By sliding the guide bars in one direction, swinging them to carry the guide eyes across the line of the needles, sliding the guide bars in the opposite direction and swinging them back to initial position to carry the guide eyes back across the line of the needles, the thread is carried around a pair of needles A, B, so as to form the loop shown in Figure 1, or that shown in Figure 2, depending upon the timing of the sliding and swinging movements which are effected, in the construction shown, by cam chains carried on drum S.

The thread or warp W, or D, is formed of a special twisted pure natural silk material to more readily permit of the close web desired in my fabric. Any colors may be used and while the colored threads are fed directly into the courses, resulting in straight bands of different colors in the fabric, it is possible by cutting the fabric on the bias to produce a diagonal effect in ties or neckwear made from the portions so cut.

In Figure 1, A, A' and A'' represent needles on the rear or back needle bar N'

and B, B' and B'' represent needles on the opposite or front needle bar N. The needles A, A' and A'' are adjacent and the needles B, B' and B'' are respectively opposite needles A, A' and A''. The same letters indicate the same needles in Figures 2 and 3.

The first element of the stitch is shown in Figure 1 and consists of loops C, C' and C'' formed by the sliding and swinging movements of one of the series of guides carrying the thread or warp around a pair of opposite needles, as above described.

The second element of the stitch is shown in Figure 2 and consists of loops formed by movements of the guides carrying warp D by which this warp is carried in clockwise direction about needle A, then about needle B' and then about needle A'' in a counter clockwise direction, and then back about needle B' beneath its starting point.

The first and second elements of the stitch are separated in time relationship, that is, they are not in phase. By adjustment of the cam setting the needle bars N and N' are brought into such relation with reference to each other and in reference to the guides that one element of the stitch is superimposed upon the other as shown in Figure 3, to form a single course, and the operation is repeated to form a second course. The two elements, one superimposed upon the other, constitutes the complete stitch or knit.

Of course each needle bar carries a large number of needles and the number of guides and spools carrying the warps corresponds with the number of needles so as to produce a web of fabric of desired width, but in the operation of knitting each adjacent stitch is formed in the manner above described and consists of the two elements described.

Having thus described my invention what I claim is:—

1. A knitted fabric comprising a plurality of courses each consisting of two stitch elements superimposed one upon the other,

each stitch element consisting of a single warp, one stitch element being formed by looping one warp about a group of two opposite needles and the other stitch element being formed by looping the other warp about a needle, thence about a diagonally opposite needle, thence about the second adjacent needle and thence returning about said diagonally opposite needle to the beginning point.

2. The process of knitting a fabric made up of a plurality of courses each comprising two stitch elements superimposed one upon the other, which consists in utilizing a single warp in each guide, imparting such motions to one guide that the single warp is looped about two opposite needles, and imparting such motions to another guide that the single warp disposed therein is looped about a needle, thence about the diagonally opposite needle, thence about the second adjacent needle and thence returning about said diagonally opposite needle to the beginning point.

3. The process of knitting a fabric made up of a plurality of courses each comprising two stitch elements, which consists in utilizing a single warp in each guide, imparting such motions to one guide that the single warp is looped about two opposite needles, imparting such motions to another guide that the single warp disposed therein is looped about a needle, thence about the diagonally opposite needle, thence about the second adjacent needle and thence returning about the said diagonally opposite needle to the beginning point, the motions imparted to the guides being in such time relation that one stitch element is superimposed upon the other stitch element.

In testimony whereof I have signed my name to these specifications this 27th day of January, 1923.

HARRY GROPPER.