Sept. 8, 1925. 1,552,483

R. HINCHLIFF

KNITTED FABRIC AND METHOD OF MAKING SAME

Filed Sept. 1, 1922

Fig. 1

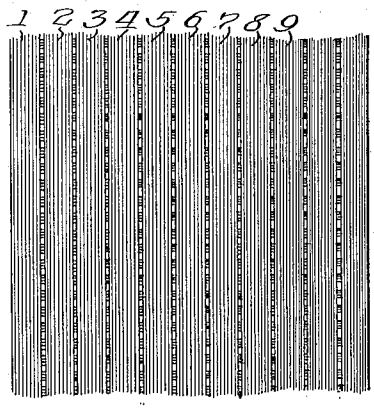


Fig. 3

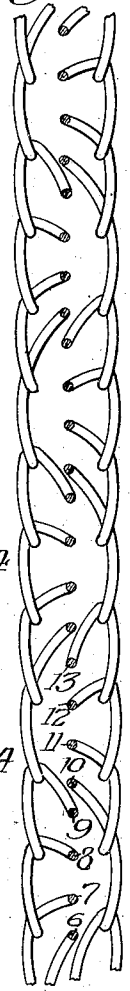


Fig. 2

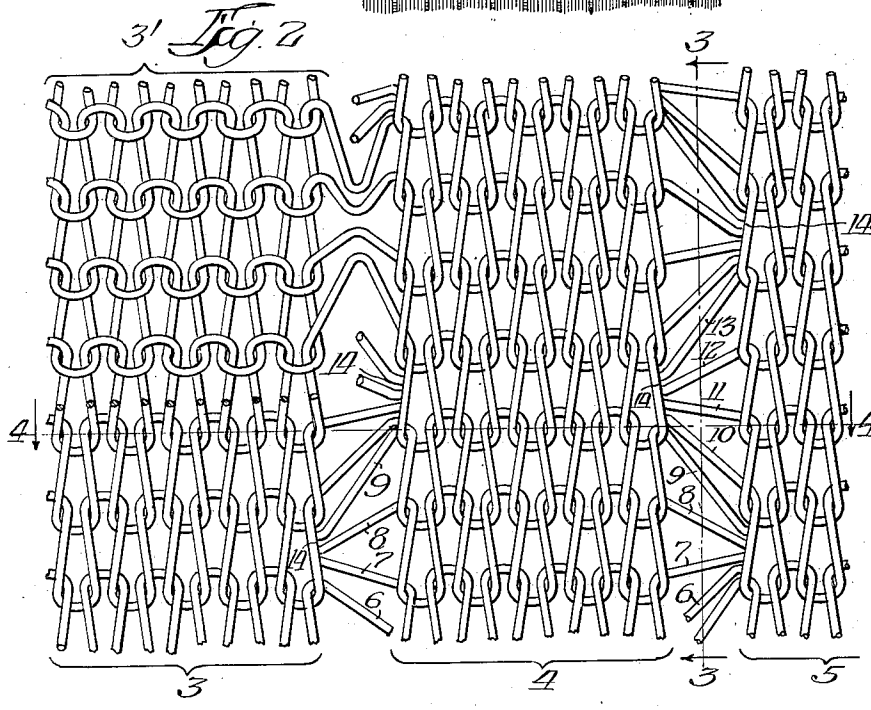
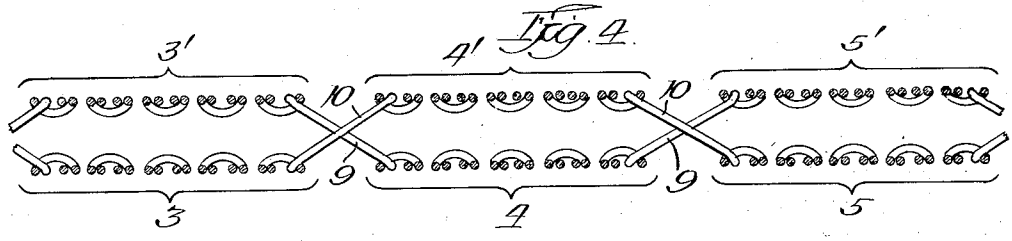


Fig. 4



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Patented Sept. 8, 1925. 1,552,483

UNITED STATES PATENT OFFICE.

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KNITTED FABRIC AND METHOD OF MAKING SAME.

Application filed September 1, 1922. Serial No. 585,726.

To all whom it may concern:

Be it known that I, RALPH HINCHLIFF, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Knitted Fabrics and Methods of Making Same, of which the following is a specification.

This invention relates to knitted fabrics and the method of making the same and aims to produce a fabric comprising a plurality of plies structurally independent of each other but so united, by the crossing of the yarns of each ply from face to face of the fabric, that a unitary double ply fabric is produced.

In the production of this fabric one or more courses of yarn are knitted alternately on opposite sides of a median plane of the fabric producing a series of longitudinally disposed webs each containing any desired number of wales, the webs being disposed in alternation on opposite sides of said median plane. A series of these webs thus formed and arranged constitute one ply of the fabric.

The other ply is similarly formed by knitting one or more courses of yarn alternately with the courses of the first ply so as to produce a series of webs similar to the webs of the first ply and also disposed in alternation upon opposite sides of the median plane of the fabric. The webs of the second ply are opposed to the companion webs of the first ply and between adjacent webs, where the web-connecting yarns of one ply extend from one face of the fabric to the other, the web-connecting yarns of the other ply also extend in the opposite direction from one face to the other of the fabric, with the result that the web-connecting yarns of the two plies cross between adjacent webs.

This construction produces therefore a double ply fabric the opposed webs of which, together with the crossed web connecting yarns between them, form a series of parallel tubes extending longitudinally of the fabric. Each tube is produced by two opposed webs each incorporated in its individual ply or fabric and the webs of each ply appear in alternation upon opposite faces of the fabric with the result that each face presents the appearance of being made up of a series of connected webs whereas, as a matter of fact, adjacent webs on both faces of the fabric are not connected one to the other but are united, by the web-connecting yarns, only with adjacent webs on the opposite face of the fabric.

My fabric therefore comprises two structurally independent webs which intersect each other at intervals and along the lines of such intersection groups of yarns extending from front to back of the fabric are disposed in alternation with similar groups of yarns extending from back to front of the fabric. This arrangement of grouping of the web-connecting yarns gives the appearance of openings between the groups of web-connecting yarns of each ply through which the web-connecting yarns of the other ply extend.

A fabric constructed in accordance with and embodying my invention is capable of many uses such as for scarfs, neckties, hat bands, belts, sweaters and other wearing apparel and, if the plies be knit of different colored yarns or of different characters of yarns or comprise combinations of the suggested differences, very beautiful and attractive results may be secured.

In order to facilitate an understanding of my invention, I have illustrated on the accompanying drawings a preferred embodiment thereof.

Referring to the drawings:

Fig. 1 is a fragmentary plan view of a fabric knitted in accordance with my invention;

Fig. 2 is an exaggerated view showing the yarn arrangement, a portion of one ply being removed to more clearly illustrate the arrangement of the yarn;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is a similar view on the line 4—4 of Fig. 2.

Referring to Fig. 1 of the drawings, it will be observed that the fabric presents the appearance of a series of parallel webs arranged in proximity to each other. Alternate webs 1, 3, 5, 7, etc., appearing on one

face of the fabric, together with the intervening connected webs disposed on the opposite face of the fabric constitute one ply of the fabric, whereas the other ply is composed of webs 2, 4, 6, 8, etc., together with the intervening connecting webs which appear on the opposite face of the fabric.

While my novel fabric may be knit on any machine capable of producing the same, my invention may be very practically carried out on a straight machine. In producing my fabric on such a machine the needles on each bed are divided into groups, each group containing as many needles as there are wales desired in each web of the completed fabric. The yarn as it is carried across the machine is knitted by the first group of needles on one bed, then carried across to the other bed and knitted by the second group of needles, thence back to the first bed where it is knitted by the third group of needles, thence to the fourth group of needles on the opposite bed, and so on across the machine, each group of needles producing a web and the webs being formed alternately on opposite beds of the machine. Upon the return course the same procedure is followed. As many courses may be knitted in this manner as may be desirable, although I have found that very satisfactory results are obtained when four courses are knitted in this manner before changing.

The other ply of the fabric is knitted by the needles which remained idle during the knitting of the first ply, i. e., as the yarn is carried across the machine, the first group of needles on the bed opposed to the first group previously employed, are thrown into operation, the yarn is then crossed over to the opposite bed and knitted by the second group of needles opposed to the second group employed in knitting the first ply, whereupon the yarn is carried across to the third group of needles on the first bed, and so on in alternation across the machine. As many courses may be knitted in the same manner in this ply of the fabric as may be desirable, although preferably equal numbers of courses are knitted alternately in the respective plies as the knitting of the fabric progresses.

It will be apparent therefore that in the production of a fabric in accordance with my invention two structurally independent plies are knitted progressively in alternation and that each ply comprises a series of webs knitted by groups of needles arranged in alternation on the two beds of the machine so that the webs are disposed alternately on opposite sides of the median plane of the fabric. The web-connecting yarns, i. e., the yarns which during the knitting are crossed from one bed to the other of the machine are, in the completed fabric, crossed from one face of the fabric to the other, and the web-connecting yarns of one ply are disposed in crossed relation with respect to the web-connecting yarns of the other ply.

Referring now again to the drawings, it will be observed that, in the fabric illustrated, four courses are knitted in each ply before the knitting is shifted to the other ply; for instance, the courses produced by yarns 6, 7, 8 and 9 are knitted forming webs 2, 4, etc., on the face presented of the fabric, and webs 1′, (not shown) 3′, 5′, etc., on the opposite face of the fabric, these webs 1′, (not shown) 2, 3′, 4, 5′, 6, etc., with their connecting yarns forming one ply of the fabric.

Four courses are then knitted in the other ply of the fabric producing webs 1, 2′ (not shown) 3, 4′, 5, 6′, etc., the web-connecting yarns 10, 11, 12 and 13 being disposed in crossed relation with respect to the yarns 6, 7, 8 and 9 of the other ply.

The web-connecting yarns of both plys in this particular fabric therefore extend from one face to the other in groups of fours, those extending from back to front being alternated with those extending from front to back, and since the grouping of the threads draws them together to a considerable extent an appearance is presented in each ply of an opening or eyelet through the ply in proximity to the stitches 14 in each web. As a matter of fact the cross connecting webs become somewhat distorted by the adjacent groups of yarns, as is illustrated on a somewhat exaggerated scale in Fig. 2, wherein a portion of web 3 is removed and the yarns extending from web 3 on one face of the fabric to web 4′ on the opposite face are illustrated.

The progressive production of the two plies in the manner explained produces in the completed fabric a series of tubes as illustrated in Fig. 4, each tube being formed by the opposed webs of the respective plies in conjunction with the crossed web-connecting yarns joining the adjacent webs of each ply and extending from one face of the fabric to the other. The resultant fabric is therefore composed of a series of contiguously arranged tubes and is formed from two structurally independent plies of fabric intersecting each other at the edges of the various tubes.

The fabric herein shown is illustrative merely, and a greater or less number of courses may be knitted in a ply before shifting the yarn to the other ply. The number of web-connecting yarns in each group will of course be dependent upon the number of courses knit before changing from one bed to the other.

The fabric therefore is composed of a plurality of plies or layers structurally independent of each other but united together into a unitary structure and in which each

ply has the appearance of being provided with openings through which the yarns of the other ply extend from one face to the other of the fabric. Two separate interlocking fabrics are thereby produced each of which comprises a series of parallel webs or panels in which the stitches are reversed as the yarn is carried from one face to the other of the fabric.

I claim:

1. A knitted fabric comprising a plurality of plies each consisting of a series of webs arranged in alternation on opposite sides of the median plane of the fabric, the webs of each ply being connected together by yarns crossing said median plane, and the web connecting yarns of each ply being disposed in groups alternating with similar groups of web connecting yarns of the other ply, whereby eyelets are formed by the said connecting yarns of said groups.

2. A knitted fabric comprising a plurality of plies each ply being formed of yarn courses knitted into multi-wale webs disposed in alternation on opposite sides of the median plane of the fabric and united by connecting yarns, the connecting yarns of each ply being arranged in groups and disposed in alternation longitudinally of the fabric with similar groups of the other ply, whereby eyelets are formed by the said connecting yarns of said groups.

3. A knitted fabric comprising a plurality of intersecting plies, each consisting of multi-wale webs disposed in alternation on opposite sides of the median plane of the fabric and connected together by cross-connecting yarns, the opposed webs of the plies together with the cross connecting yarns forming a series of parallel longitudinally extending tubes, the cross connecting yarns of each ply being disposed in groups arranged in alternation with and crossing the similar groups of the other ply, whereby eyelets are formed by the cross-connecting yarns of said groups.

4. A multi-ply knitted fabric each ply of which comprises a series of multi-wale longitudinally extending webs disposed in alternation on opposite faces of the fabric and in opposition to similar webs of the other ply so as to form a series of inter-connected tubes, the adjacent webs of each ply being secured together by cross-connecting yarns arranged in groups longitudinally of the fabric and disposed in alternation with similar groups of the other ply, whereby eyelets are formed by the cross-connecting yarns of said groups.

5. The method of knitting a multi-ply fabric each ply of which comprises a series of multi-wale longitudinally extending webs disposed in alternation on opposite faces of the fabric and in opposition to similar webs of the other ply so as to form a series of interconnected tubes, the adjacent webs of each ply being secured together by cross-connecting yarns, consisting in progressively knitting plural courses, each course being knit with opposed alternating groups of needles so as to provide said longitudinally extending webs disposed in alternation on opposite faces of the fabric, and in knitting plural courses with alternating groups of needles opposed to those above mentioned whereby to produce webs in opposition to similar webs of the other ply.

6. The method of knitting a multi-ply fabric consisting in progressively knitting plural courses, each consisting of a series of webs extending longitudinally of the fabric disposed alternately on opposite sides of a median plane of the fabric, the adjacent webs of each ply being secured together by cross-connecting yarns.

RALPH HINCHLIFF.