Sept. 30, 1941. W. L. SMITH, JR 2,257,718

KNITTED FABRIC AND METHOD

Filed Feb. 5, 1940

FIG. 1.

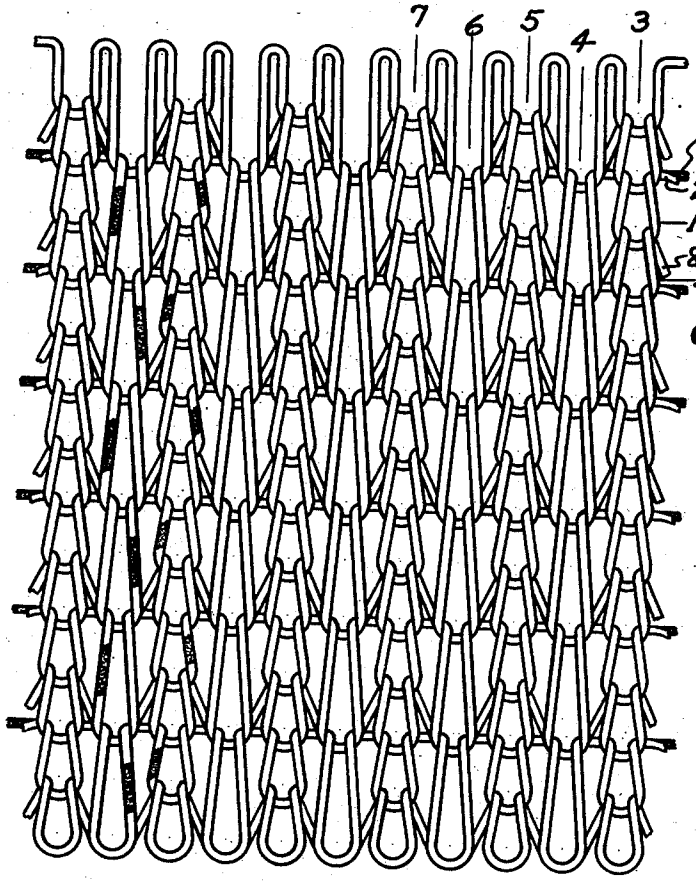


FIG. 2.

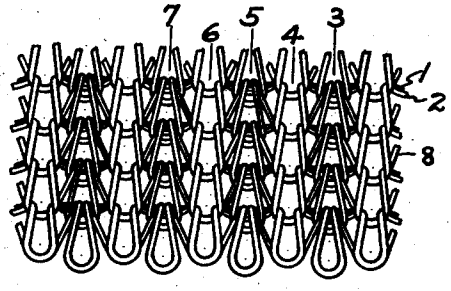
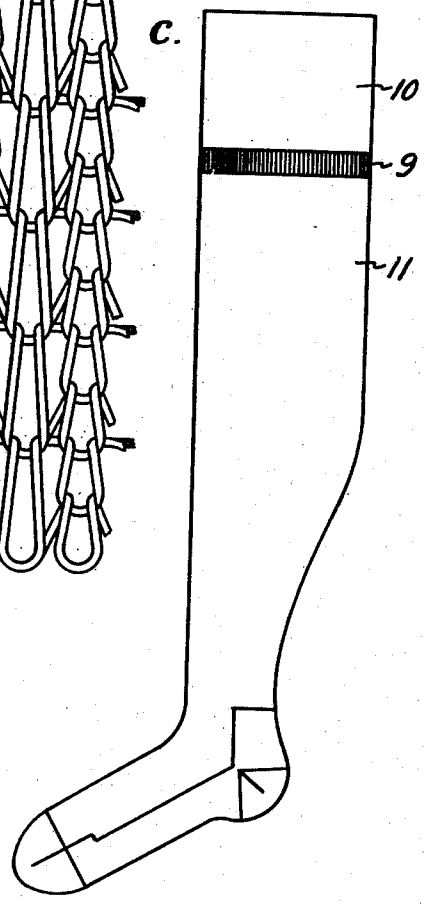


FIG. 3.



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KNITTED FABRIC AND METHOD

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6 Claims. (Cl. 66—172)

This case involves an invention in knitted fabrics and the method of producing the same. The fabric is of the type having elastic yarn incorporated therein which serves to impart a great degree of elasticity to the fabric both in a lateral and longitudinal direction. The fabric is preferably to be used in hosiery, one example of a part of hosiery to which the said fabric may be applied is that of the knee section of ladies' stockings, either circular knit or full-fashioned, for the purpose of imparting elasticity especially in a lengthwise direction as for eliminating strain in that part of the knitted article and avoiding runs.

In the figures of drawing:

Fig. 1 is a conventional showing of a section of fabric, greatly enlarged, according to the invention;

Fig. 2 is a somewhat similar view but showing the fabric more as it actually appears as the elastic yarn has contracted to a certain extent thereby distorting the stitch structure and creating an appearance different from that which might be imagined from a purely theoretical consideration as illustrated in Fig. 1; and

Fig. 3 is a conventional view of a ladies' type stocking, circularly knit, to which the invention has been applied.

Referring to Fig. 1, a section of fabric is shown in which the course A is the first course having elastic incorporated therein. The elastic 1 is knitted in alternate wales as is also a non-elastic yarn 2. These alternate wales are indicated by the numerals 3, 5, 7 while intermediate wales 4 and 6 have the elastic as well as the non-elastic yarn incorporated therein but in a different manner. Both the elastic and non-elastic yarns have been taken in the hooks of needles and drawn through previously drawn loops in the course A. The same applies to the elastic and non-elastic yarns in the intermediate wales such as 4 and 6. However, in the next course B, knitted at a different feeding station, another non-elastic yarn 8 is fed to all needles and is immediately knitted through stitches which were drawn in the alternate wales in course A. In the intermediate wales such as 4 and 6 the stitches of elastic yarn 1 and non-elastic yarn 2 were not cleared below latches and the yarn 8 is taken in the hooks of those intermediate needles so that three yarns are held at one time in their hooks.

In the next course C the yarns 1 and 2 are again taken by all needles and are knitted through previously held stitches so that in the alternate wales 3, 5, 7 etc., stitches are immediately drawn through the last drawn stitches of the yarn 8. In the intermediate wales 4, 6, etc., stitches are drawn through previously held stitches of the three loops above mentioned. Thus in the intermediate wales tuck stitches are knitted, intermediate needles knitting off only on every other course. In the alternate wales stitches are knitted off in every course.

The method by which the above described fabric is knitted will be briefly described. Preferably a circular type machine is to be employed although that is not entirely essential as the method may be practiced on other types such as full-fashioned machines. If a circular machine is employed it is convenient to have two feeding stations, at one of which a non-elastic yarn such as 8 is to be fed and at the other of which an elastic yarn 1 and a non-elastic yarn 2 are fed. At the first mentioned feed selection of needles is to be provided wherein all needles will be elevated high enough to take the yarn 8 in their hooks, only alternate needles such as those knitting in wales 3, 5 and 7 being raised to a latch clearing position. At the second mentioned feed all needles are raised to a clearing position and all needles take both yarns 1 and 2 in their hooks. Needles are drawn downwardly to a knitting level at each of these feeds. Since at the first feed alternate needles alone cleared their latches, those needles only cast off their last drawn stitches and knit. The intermediate needles merely take yarn at that feed, that yarn being the yarn 8 which, as above stated, tucks in combination with yarns 1 and 2 drawn at the other side of the machine.

Now referring to Fig. 2, the same numerals as employed in Fig. 1 are used to designate the yarns and also the wales. It may be seen how in the alternate wales 3, 5, 7 etc., the elastic yarn has contracted and has drawn the courses together longitudinally or lengthwise of the wales. It is natural that the elastic contracts more in these wales 3, 5 and 7 since the tuck wales 4 and 6 tend to be tighter anyway. Of course, the elastic contracts all of the wales to some extent and in the wales 3, 5 and 7 that contraction leaves certain of the non-elastic yarn loops loosely connected to adjacent loops. Thus a fabric results which, upon being released from the machine, will contract to a marked extent along the lengthwise direction of knitting, this contraction being useful for the purpose herein described since the fabric will be highly extensible in a direction along its wales. The

fabric is also very elastic laterally and serves the purpose illustrated in Fig. 3 since it may be employed at the knee section of a stocking without constricting that part of the stocking unnecessarily. The elasticity lengthwise is at least 100% or more, that being quite satisfactory for preventing runs at the knee section of a stocking, those runs resulting largely from excessive tension in non-elastic parts of the fabric.

In Fig. 3 a section 9 knitted as described with reference to Figs. 1 and 2, has been inserted below the welt 10 of a circularly knitted stocking, although it is to be understood that this fabric whether knitted circularly or by reciprocatory work is equally applicable to the product of full-fashioned hosiery machines. In such cases the fabric may be knitted on the full-fashioned machine directly or may be knitted on a circular machine and transferred in a known manner, the remainder of the article being knitted on the full-fashioned machine. The section 9 may be of varying lengths according to the amount of elasticity which it is desired to incorporate in the fabric. It may be conveniently located beneath the welt and above the leg 11 of a stocking, or may extend into the welt and serve to some extent as a garter.

The yarn 2 may be referred to as a plating yarn in that it is preferably fed in such a manner as to cover the elastic yarn 1 as illustrated. The yarn 2 will evidently be of the same material and will match as nearly as possible the yarn 8. This will assure that the elastic section 9 appears outwardly very little different from the plain knitted fabric either at the leg or at the welt of the stocking. The yarn 2 may be omitted in which event the elastic yarn will approach as nearly as possible the appearance of yarn 8. If the yarn 2 is omitted the lengthwise extensibility of the section will be greatly increased.

The welt 10 may be knitted in any satisfactory way and may be of single or double thickness. It may be knitted, or at least a portion thereof may be knitted in the same manner as above described with respect to the section 9. In that case a non-elastic yarn will be substituted for the elastic yarn 1. Alternatively, the elastic yarn 1 may merely be omitted and yarns 2 and 8 knitted by the method disclosed. This will result in a type of mock rib fabric which serves fairly well for a welt structure, or at least for a connecting fabric between a turned or other welt and the elastic section 9. The elastic yarn is fed under a light tension so that the whole section will not contract laterally more than enough to present a somewhat ribbed appearance. The greater part of the contraction is evidenced in lengthwise shortening of the fabric. Certain modifications and other uses to which the fabric and method of knitting herein disclosed may be applied will occur to those skilled in the art. The invention is to be limited only by the scope of the appended claims.

I claim:

1. A knitted fabric having elastic yarn incorporated therein along with non-elastic yarns knitted in alternating courses, the elastic yarn and one non-elastic yarn being drawn into knitted stitches at alternate wales in a course and tucked at intermediate wales and the other non-elastic yarn being knitted in alternate wales and combined in intermediate wales with the tuck stitches of the two yarns aforesaid.

2. A knitted fabric having therein an elastic yarn and two non-elastic yarns knitted in combination in such a way that one of the non-elastic yarns is knitted independently while the other non-elastic yarn knits with the elastic yarn but in such a manner as to plate it, the elastic and one non-elastic yarn being knitted in spaced wales and tucked in intermediate wales with stitches of the other non-elastic yarn.

3. A knitted fabric having therein an elastic yarn and two non-elastic yarns knitted in combination and in such a manner that one of the non-elastic yarns plates the elastic yarn, said elastic yarn and its plated non-elastic yarn being knitted in alternate wales and tucked in intermediate wales.

4. A stocking having an elastic stretch section in the knee portion thereof knitted from an elastic and two non-elastic yarns, the elastic being knitted in alternate courses at every other wale and being tucked at intermediate wales and having one non-elastic yarn knitted in plating relation thereto.

5. A method of knitting a fabric having an elastic yarn incorporated along with two non-elastic yarns including the steps of feeding a non-elastic yarn and knitting the same at every wale in a course, feeding and knitting a second non-elastic yarn in an adjacent course so that in alternate wales the said two non-elastic yarns will be knitted into independent stitches but at intermediate wales said yarns will be knitted as tuck stitches, and knitting an elastic yarn along with one of said non-elastic yarns so that the same will be plated by that non-elastic yarn.

6. A stocking having an elastic section at the knee portion adapted to relieve strain on that section of the fabric and including courses knitted from an elastic yarn combined with two non-elastic yarns, the construction being such that each non-elastic yarn forms a knitted stitch in alternate wales and both combine to form tuck stitches in intermediate wales, stitches of elastic yarn being knitted at each alternate wale and combined in the tuck stitches at intermediate wales and plated at all wales by one of the non-elastic yarns.

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