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E. ST. PIERRE ET AL

2,308,121

KNITTED FABRIC

Filed Nov. 16, 1938

FIG. 1.

FIG. 2.

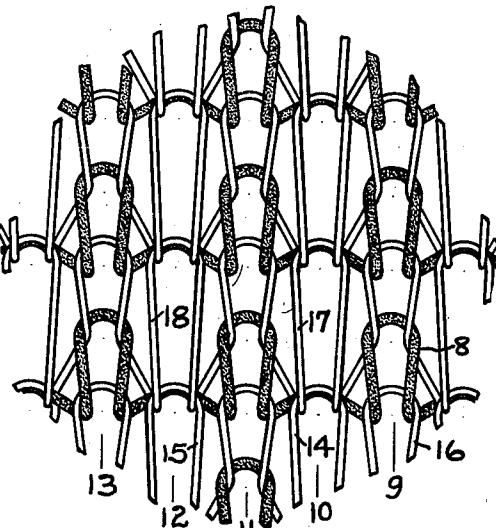
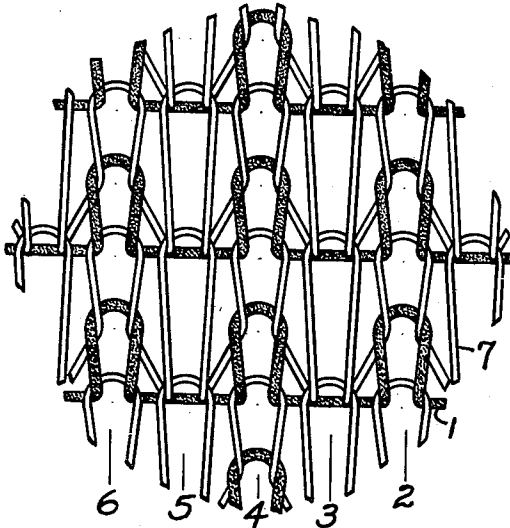


FIG. 3.

FIG. 4.

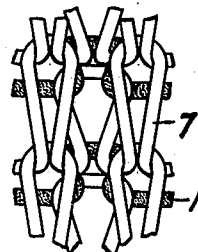
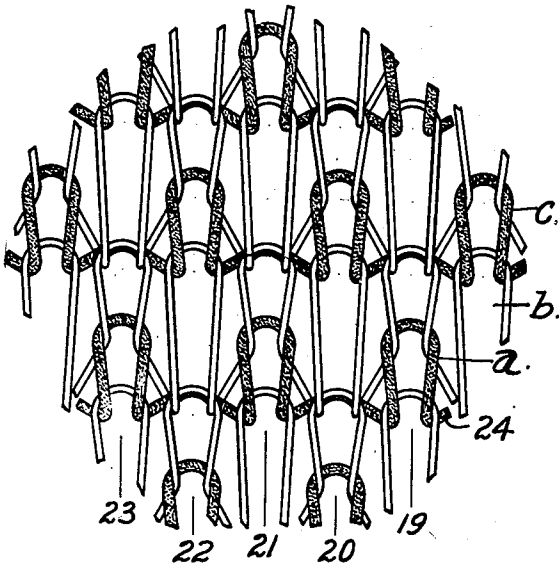
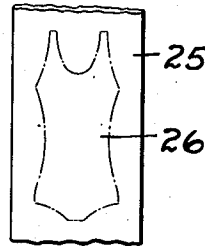


FIG. 5.



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# UNITED STATES PATENT OFFICE

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## KNITTED FABRIC

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Application November 16, 1938, Serial No. 240,638

2 Claims. (Cl. 66—202)

This application deals with knitted fabrics, such as the so-called body fabrics, more especially such fabrics in which elastic yarn is incorporated in a manner more fully described hereinafter.

In the figures of drawing:

Figs. 1, 2 and 3 are conventional showings of sections of fabric knitted in accordance with the invention, each of the figures showing a slightly different form thereof although each has similar characteristics and is possessed of the same advantages with respect to the specific purposes for which used;

Fig. 4 is a small section of fabric showing the same contracted and in very much the form it appears when taken from the machine; and

Fig. 5 is a diagrammatic view showing the flat section of fabric and indicating the manner in which a part for a garment has been cut therefrom.

The fabrics which form the subject matter of this case are similar in many respects to that of St. Pierre Patent No. 2,131,720 and to that shown in the recent application of Eugene St. Pierre, Serial No. 238,462, filed November 2, 1938. The said fabrics are knitted, generally speaking, by knitting at a plurality of feeds, at least two, but in respect to body fabrics, on machines having a greater number of feeds in practical instances. The elastic yarn is to be fed at spaced feeds, at least, no closer than at every other feed and probably for many purposes at every third, fourth, or feeds spaced to a greater extent. The said elastic is to be fed to selected needles, for instance, to alternate needles or to needles spaced a greater distance. The plain yarn or yarns will be fed separately at other feeds such as the intermediate feeds and will be knitted upon all needles. There are to be described slightly different modifications in respect to this general method, and it is to be understood that the invention is not limited as to the particular arrangement of elastic stitches with respect to stitches of plain yarn, although preferred embodiments of the same are herein illustrated. By the term elastic yarn, it is intended to include the various commercially practical elastic or rubber threads, either covered or uncovered. By the term plain yarns, it is intended to include the various strands commercially employed such as cotton, silk, wool or yarns constructed of the various artificial filaments.

It is well known that at this time many so-called body fabrics include elastic yarn incorporated in some manner. These yarns tend to enhance the appearance of the fabric, or at least

the garments made therefrom and to impart to them more satisfactory characteristics such as increasing the restraining effect thereof or in improving the fit. In contrast to such advantages in the finished garment, the presence of the elastic knitted under some degree of tension and tending to contract the fabric and in other manners to distort the same, renders these fabrics harder to handle, less satisfactory with respect to a selvage, and much more likely to roll or curl at the edges. All this is a disadvantage in the construction of garments in which the various parts thereof are to be cut according to some pattern and later sewed. Among the advantages inherent in the present fabrics are a marked decrease in tendency to curl when cut, a greater degree of resistance to running, pleasing appearance and a very satisfactory stretch which assists in imparting proper restraining characteristics without rendering the fabric exceedingly difficult to handle.

Referring to Fig. 1, a section of fabric is illustrated in which an elastic yarn 1 is fed to every other or alternate needles knitting in wales 2, 4, 6, etc. These needles will be divided or selected to take this elastic yarn only, such dividing mechanism being well known at this time and not necessary of detailed description in this case. In the particular form of the invention illustrated in Fig. 1 this elastic yarn is fed at every other feed of a multi-feed machine. In such instance it would not be the same elastic yarn fed in consecutive courses. For example, if the machine were a four feed type, one elastic yarn would be fed at feed number one and another elastic at feed number three. A plain yarn would be fed at each of feeds numbered two and four. Of course, in other forms of the invention the elastic might be fed at more widely spaced points, and for machines having many more feeds, the number of elastic yarns fed would be greater.

A plain yarn is indicated at 7 being knitted on all needles so that said plain yarn is actually knitted in wales 2, 4, 6 and in addition thereto the intermediate wales 3, 5, etc. The elastic will be fed under a suitable knitting tension; this tension is preferably exceedingly slight when compared with the amount of tension generally employed in incorporating elastic by other methods. The result of such knitting is that in the even numbered wales 2, 4, 6, there will be stitches of plain and elastic yarn in alternation, while in the intermediate wales 3, 5 etc., stitches of plain yarn only will be evident. Floats of the elastic will pass in back of these stitches in

said odd numbered wales. Depending upon the amount of tension, the fabric will contract to more or less the form shown in Fig. 4. There it is illustrated at about what degree the elastic loops decrease in size with respect to the original size of loop drawn by the needle. This will depend greatly upon the size of stitch being drawn at these elastic yarn feeds as well as the tension under which the elastic is actually incorporated. The contraction of the elastic which affects both the size of stitch and length of float between stitches will draw the wales 2, 4 and 6 together projecting the wales 3, 5 etc., to the front of the fabric and will thus constitute a fair resemblance of rib work. The subsequent stretch of the fabric when worn depends upon the amount of stretch permitted by the base fabric, that is, the fabric knitted from the so-called plain yarn. By knitting that portion of the fabric more loosely it is possible to provide for an exceedingly great amount of stretch without any appreciably rapid tightening of the material up to the point of maximum enlargement.

Referring to Fig. 2, a similar fabric is shown but the elastic in this instance is taken not only by alternate needles at that feed knitting said elastic, but is also taken in the hooks of intermediate needles. However, only alternate needles knit the elastic at that feed. The remaining needles tuck and do not knit until they reach the next plain yarn feed at which a loop of plain yarn is drawn through each accumulated loop of plain and elastic yarn. The elastic yarn 8 is shown actually being knitted into individual stitches in wales 9, 11 and 13, but is taken in the hooks of needles in the intermediate wales 10 and 12 in addition to stitches 14 and 15, for example, which were drawn from a plain yarn 16 at the previous plain yarn feed. At the next course knitted from plain yarn, loops 17 and 18 in wales 10 and 12 are drawn through the accumulated loops above mentioned. The result is that this form of the invention does not have floats which are as perceptible at the back of the fabric, tends to lie flat, and is not quite so easily raveled at the edges where cut before being sewed or upon being subjected to some subsequent garment forming operation. When cast from the needles, this fabric will contract and will assume a somewhat similar appearance to that assumed by the first mentioned form, Fig. 4.

In Fig. 3 there is illustrated a still different form of the invention wherein the individual loops of elastic yarn are arranged in a staggered form. This is easily accomplished in a multi-feed type of machine since subsequent elastic feeds may be arranged so that the said elastic yarn is fed first to alternate needles and thereafter at the next following feed, to intermediate needles. In this form of the invention the immediate needles for any particular course of elastic miss the yarn as in Fig. 1 or may take it to tuck as in Fig. 2. For example, it has been shown in Fig. 3 tucked as previously described with respect to Fig. 2. In wales 19, 21 and 23, course a, the elastic 24 has been taken and intermediately knitted by alternate needles. The intermediate needles in wales 20 and 22 have tucked the elastic along with the previously drawn plain yarn and in the next course b knitted at a subsequent feed and from plain yarn, these individual loops will have stitches of plain yarn drawn through them and also, as in Fig. 2, the tucked or accumulated loops will be knitted off as other loops are drawn through them. In the next course c

of elastic, a similar process has been resorted to except that knitting is upon intermediate needles while tucking is upon alternate.

In this form of the invention as illustrated in Fig. 3, the same tendencies to preserve the selvage and for the fabric to resist curling and lie flat are apparent. Furthermore, it is a fact that each of these fabrics is locked against running in the direction of knitting—from bottom to top as illustrated herein. The first two forms will run in the opposite direction, but it is exceedingly difficult to run the wales in which the elastic loops have been drawn. Since elastic loops are drawn in all wales in the form of fabric illustrated in Fig. 3, the fabric is substantially run-resistant in both directions. The stretch in the first two forms is more or less limited to lateral stretch. The fabric is not perceptibly more stretchable lengthwise than plain fabric would be. To the contrary, the third form of the fabric is capable of being extended in either direction and is thus unusually adaptable to knitting of fabric such as for bathing suits, corsets or girdles in which this two-way stretch characteristic is so desirable. The individual elastic loops in each wale make it perfectly easy to stretch this fabric lengthwise through a much greater extent than in any other fabric of which applicants are aware except for fabric knitted entirely from elastic yarn or of courses in which elastic yarn appears throughout the entire course to the exclusion of the plain yarn.

In Fig. 5 we have shown diagrammatically a flat piece of fabric such as will be taken from a circular, body type machine, the said fabric being knitted as a tube but thereafter being slit prior to cutting therefrom various shaped pieces as for subsequent garment tailoring. The fabric is generally indicated at 25 and the portion 26 shows the manner in which a piece may be cut therefrom in accordance with any desired pattern for the purpose above indicated. It is at this point that certain difficulties have been experienced heretofore and which as previously explained are practically overcome with fabrics knitted as herein described. The invention is defined in the following claims.

We claim:

1. In a plain knitted fabric of the so-called body fabric type, recurrent and closely adjacent courses knitted from inelastic yarn and formed into loops at every wale and an elastic yarn at said courses formed into individual loops knitted through plain loops in some of the wales and tucked with other loops in intervening wales, said elastic yarn lying in the fabric under a relatively light tension, the elastic yarn loops and tucked loops of that elastic yarn being staggered in adjacent courses.

2. In a plain knitted fabric of the so-called body fabric type, a plurality of courses knitted from inelastic yarn and in which there is a loop of said inelastic yarn drawn at every wale in each said course wherein that yarn appears, an elastic yarn knitted to be incorporated in each of said courses and formed into individual loops of said elastic yarn knitted through loops of said inelastic yarn at alternate wales in said courses and tucked at intermediate wales in those courses, said elastic yarn being incorporated in the fabric under relatively light tension and at consecutive courses being knitted and tucked in staggered relation.

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