Aug. 26, 1941. K. ANTON 2,254,131

KNITTED ELASTIC FABRIC

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Fig. 1

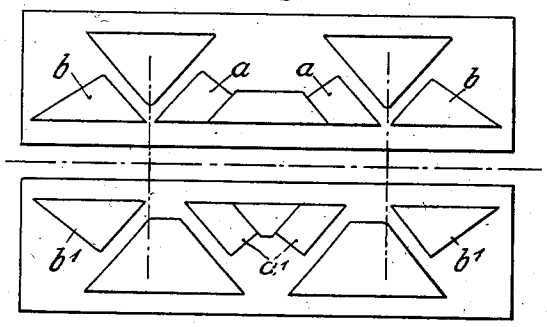


Fig. 2

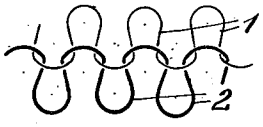


Fig. 3

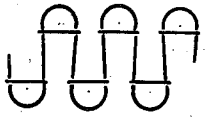


Fig. 4

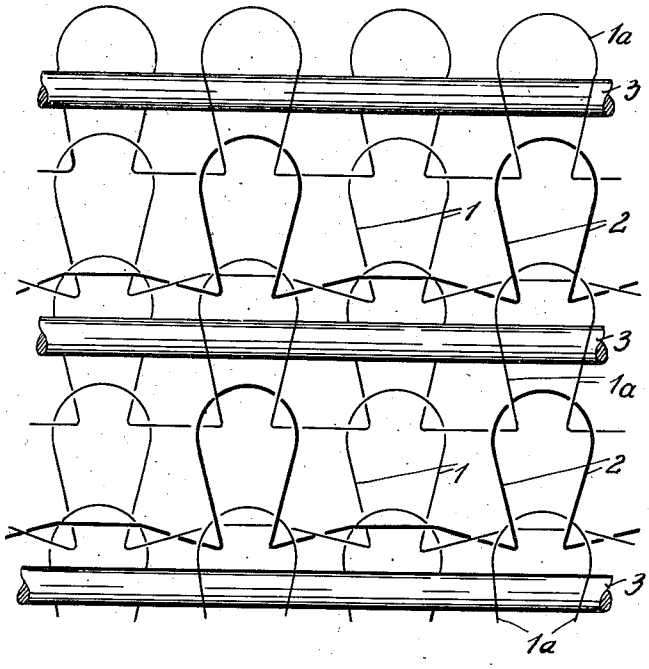
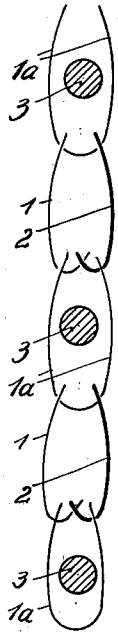


Fig. 5



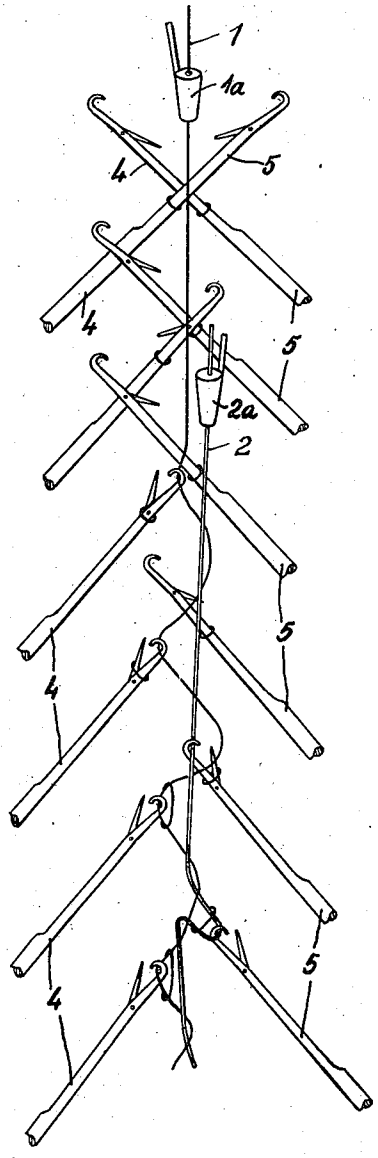
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Fig. 6



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UNITED STATES PATENT OFFICE

2,254,131

KNITTED ELASTIC FABRIC

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In Germany February 11, 1939

4 Claims. (Cl. 66—190)

This invention relates to certain improvements in knitting machines and has particular reference to a special cam box or lock of the two-system type and a composite elastic looped fabric produced thereby.

It is the object of the invention to provide a cam box for the production of a combined looped fabric which is similar to the known ribbed goods and the two sides of which can be made to differ from each other as to their material and color. Hitherto, this was only possible with double rib or cardigan goods.

The character of the invention may be understood by reference to certain of its structural forms, as illustrated by the accompanying drawings in which:

Fig. 1 is a schematic view of a special lock or double cam box having the invention applied thereto.

Fig. 2 is a diagrammatic view showing a combined stitch course.

Fig. 3 is a diagrammatic view showing a ribbed course (one and one ribbed course).

Fig. 4 is a scheme showing the complete structure of the stitches of an elastic fabric including a rubber weft and being elastic in several directions.

Fig. 5 is a cross sectional view of Fig. 4.

Fig. 6 is a diagram showing the various phases in the formation of a combined stitch course in accordance with the invention.

Similar reference numerals denote similar parts in the different views.

Referring now to the drawings in greater detail, and first to Fig. 1, it will be seen that the inner pairs of wing cams *a*, a^1 are arranged differently with reference to the center line of the double cam box, while the outer pairs of wing cams *b*, b^1 are arranged symmetrically with reference thereto. The wing cams *a*, a^1 therefore respectively cause a non-symmetrical withdrawal of the needles, while the wing cams *b*, b^1 cause a like withdrawal of the needles. The non-symmetrically arranged wing cams *a*, a^1 operate always with two thread carriers or yarn guides spaced by a short interval in operation, one thread carrier feeding the knitting thread 1 to the rear needle row while the other feeds the knitting yarn 2 to the front needle row. The symmetrically arranged pairs of wing cams *b*, b^1 operate with a yarn guide which feeds knitting yarns 1*a* to both of the needle rows at the same time, in known manner. In this manner, two different types of stitch courses are produced alternately, i. e., one combined type of course, Fig. 2, formed by two yarn guides and consisting of two plain courses (one-needle-bed-plate-courses) which are interlaced with each other after the manner of warped web, while the second type of course, Fig. 3, is formed by one yarn guide and is a normal ribbed course (one-and-one course). The interlacing of the two plain courses forming together the combined stitch course, Fig. 2, results from the fact that the needle rows of the two needle beds are brought forward simultaneously, owing to the particular arrangement of the cams, but drawn off at different times. The various steps or phases in the formation of the combined stitch course (Fig. 2) are represented schematically in Fig. 6, in which the two cooperating needles are designated with 4 and 5, resp., and shown in their various positions taken up in the successive steps of the knitting operation, while 1, e. g., is a textile thread, 1*a* the thread guide for the textile thread, 2 a rubber thread and 2*a* the thread guide for the rubber thread.

The needle lifters of the cam box may consist of one piece or of a plurality of parts, in the form of a tube lock.

Since the combined stitch course is formed by two yarn guides operating simultaneously, owing to the particular arrangement of the wing cams, the two needle rows may be fed with quite different threads, whereby a wide variety of different stitch and color effects may be attained. For example, if in the formation of the combined stitch course the front row of needles is fed with a wool thread while the rear row is fed with an artificial silk thread and the rib in turn is formed by a wool thread, a fabric will be obtained the front side of which consists entirely of wool thread stitch courses, while on the back wool thread stitch courses are produced in alternation with stitch courses of artificial silk thread.

Where it is intended to produce any color effects, for instance, a black thread is supplied to the front row of needles in the combined stitch course while a white thread is supplied to the rear row of needles and the rib course in turn is formed of a black thread. Thus, the front side of the fabric consists entirely of black stitch courses while the rear side is formed of alternate black and white stitch courses. Again, by feeding, for example, a blue thread to the front needle row in the combined course instead of a black thread, a front side having blue and black stitch courses and a rear side having white and black stitch courses may be obtained.

It is also contemplated, within the purview of the invention, that one or more non-elastic knitting threads 1 may be fed to one needle row, in the combined stitch course, while an elastic knitting thread 2 is used for feeding the opposite needle row, as indicated in Fig. 6. In this case and with the aid of rubber wefts an elastic fabric is obtained, Fig. 4, which is elastic in two directions and is suitable for the production of orthopedic stockings or hose, socks, knee caps, hip and breast formers and the like.

In addition, if the needle lifters of the lock or cam box are made as hose locks, it is possible each time to put out of action the lagging pair of locks with the associate thread guide, so that one combined stitch course only is produced in each operation and all rib courses are disposed of. This renders it possible, by the use of different knitting threads for each row of needles, to produce a type of ribbed goods the two surfaces of which consist of different materials throughout. For example, the front side may consist entirely of stitch courses of wool, while the rear course consists entirely of stitch courses of cotton etc.

The above mentioned combinations could not be produced in the ribbed goods heretofore known, since the two sides thereof always turn out similar. Therefore, such combinations could be produced by pearl stitch knitting only, which, however, is thicker than ribbed goods and less elastic.

The operation is as follows:

For example, the combined stitch course, Fig. 2, is formed on a stroke of the carriage to the right by the leading or forerunning pair of locks, owing to the diverging withdrawal of the needles of the inner wing cams a, a^1, Fig. 1, while the lagging pair of locks owing to the corresponding needle withdrawal of the outer wing cams b, b^1, Fig. 1, effects the formation of the rib course, Fig. 3. As will be readily understood, the stitches are formed in the same manner on a stroke of the carriage to the left. Hence, the combined stitch course, Fig. 2, is always formed by the leading or forerunning pair of locks while the rib course, Fig. 3, is always formed by the lagging pair of locks.

The method and apparatus of the present invention have been described in detail with reference to specific embodiments. It is to be understood, however, that the invention is not limited by such specific reference but is broader in scope and capable of other embodiments than those specifically described.

I claim:

1. A combined looped fabric, comprising a network of stitches consisting of combined stitch courses and normal ribbed courses, all stitch courses of one side of the fabric consisting of a uniform thread material while on the opposite side the thread material changes with each succeeding stitch course.

2. A combined looped fabric, comprising a network of stitches consisting of combined stitch courses and normal ribbed courses, all stitch courses of one side of the fabric consisting of a uniform thread material while on the opposite side the thread material changes with each stitch course, said fabric comprising knitting threads of rubber.

3. A combined looped fabric, comprising a network of stitches consisting of combined stitch courses and normal ribbed courses, all stitch courses of one side of the fabric consisting of a uniform thread material while on the opposite side the thread material changes with each stitch course, said fabric comprising wefts of rubber.

4. A rubber-elastic looped fabric for bandages and the like, in whose manufacture elastic thread is used to form loops as well as being laid in as weft, consisting of ribbed courses containing the rubber weft alternating with double-faced stitch courses each formed of two plain courses, one of the two plain courses consisting of an elastic thread, and the two plain courses having their sinker loops interlaced.

KURT ANTON.