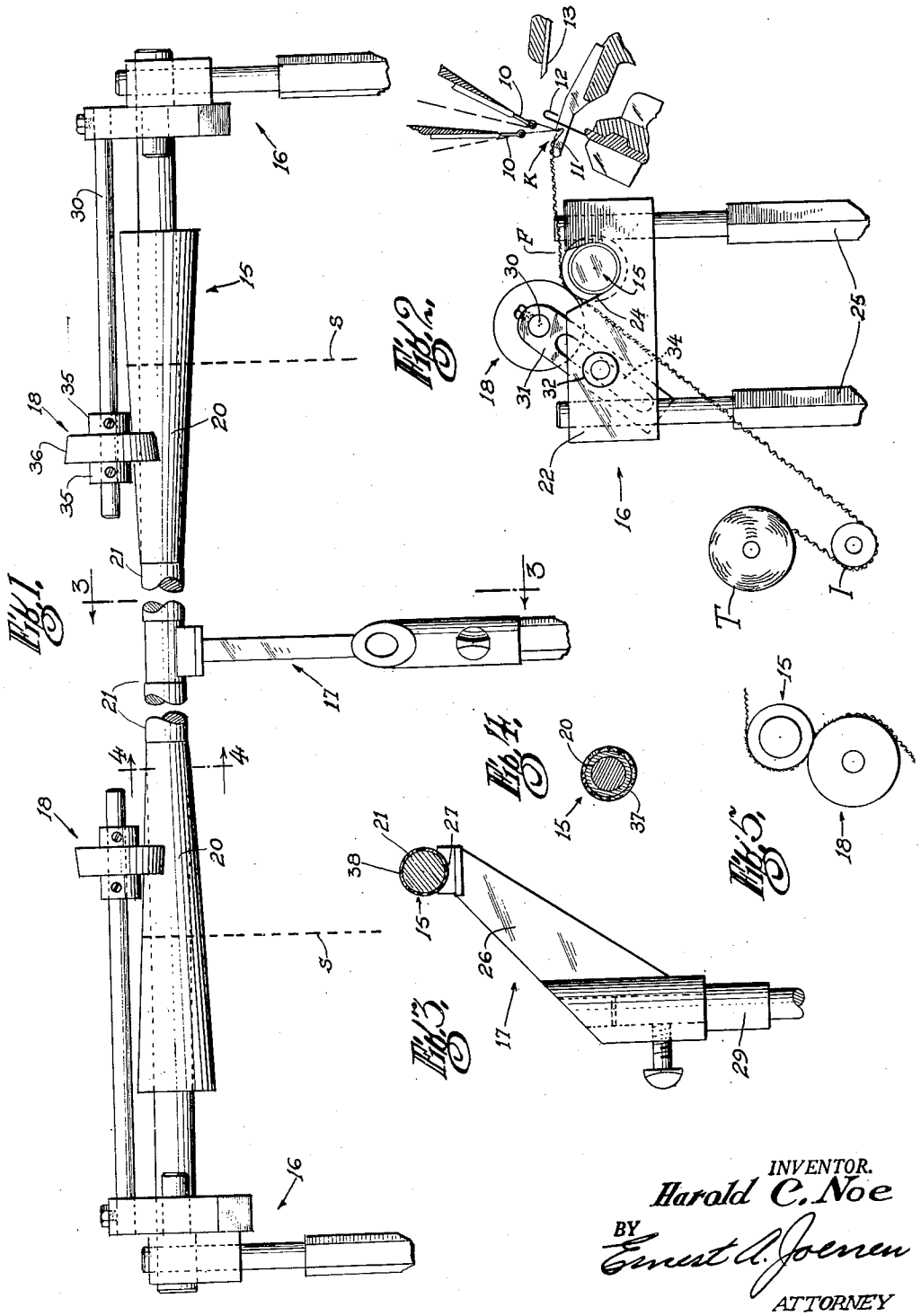
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FABRIC TAKE-UP ASSISTING APPARATUS FOR WARP KNITTING MACHINES

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FABRIC TAKE-UP ASSISTING APPARATUS FOR WARP KNITTING MACHINES

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The present invention relates to warp knitting machines, and, more particularly, to apparatus for assisting the take-up of the fabric produced on such machines.

It has been customary to take-up the fabric produced on various types of warp knitting machines by passing the fabric over a smooth bar or rod as it leaves the knitting elements and then winding the fabric on a power driven take-up roll operated by the drive of the knitting machine. In many instances, the inherent characteristics of the fabric, resulting from the knitting stitch and/or the material employed in its production, were such that the fabric, in leaving the knitting elements, tended to contract or curl inwardly crosswise at the selvages thereof, whereby the width of the fabric wound on the take-up roll was much less than that at the knitting line of the machine. For example, fabric knitted on a machine having a fourteen foot knitting line would contract as much as one foot or more at each selvage.

Accordingly, an object of the present invention is to overcome the foregoing difficulties in a simple and practical manner.

Another object is to provide fabric take-up assisting apparatus which minimizes contraction of the fabric at the selvage zones.

Another object is to provide such apparatus which maintains the fabric in a condition to facilitate smoother and more even winding thereof on the take-up roll.

Another object is to provide such apparatus which enables the knitting elements and the take-up roll to be synchronized more readily and accurately whereby knitting at higher speeds is made possible.

Another object is to provide such apparatus which is extremely simple and economical in construction.

A further object is to provide such apparatus which can be installed on existing knitting machines as well as newly constructed machines.

A still further object is to provide such apparatus which is sturdy, practical and reliable and requires a minimum of supervision or servicing to maintain the same in operation.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

In accordance with the present invention, the foregoing objects are accomplished by providing fabric take-up assisting apparatus for warp knitting machines which generally comprises an elongate roll adjacent and parallel to the knitting line over which the fabric passes and having a section adjacent each end thereof of increased diameter or of increasing diameter towards the respective end of the roll where it is located, means for rotatably supporting the roll, and means such as a roller adjacent each of the sections for engaging the fabric adjacent the selvages thereof to hold the fabric against the sections to prevent crosswise contraction thereof.

A preferred embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a fragmentary front elevational view of the take-up assisstng apparatus in accordance with the present invention.

Fig. 2 is a fragmentary schematic end view of the apparatus shown in Fig. 1, illustrating its relation to the knitting elements and the take-up roll of a knitting machine, the take-up roll being shown on a reduced scale.

Fig. 3 is a sectional view taken along the line 3—3 on Fig. 1 illustrating the manner in which the take-up assisting roll is supported between the ends thereof.

Fig. 4 is a sectional view taken along the line 4—4 on Fig. 1 illustrating the means on the surface of the end sections of the take-up assisting roll for frictionally gripping the fabric.

Fig. 5 is a schematic view illustrating a modification of the invention.

Referring to the drawing, and, more particularly, to Figs. 1 to 3 thereof, take-up assisting apparatus is shown which can be installed on warp knitting machines. In the illustrative embodiment, the knitting machine has knitting elements comprising guides **10**, sinkers **11**, bearded needles **12** and a pressure bar **13** adapted to produce fabric F at the knitting line K (Fig. 2). However, it will be understood that the apparatus can also be utilized in connection with warp knitting machines having other arrangements of knitting elements. The warp knitting machine shown is provided with conventional fabric take-up means including an idler roll I and a take-up roll T.

The apparatus in accordance with the present invention generally comprises an elongate roll **15** adjacent and parallel to the knitting line K, end supports **16** for the roll, intermediate supports **17** for the roll, and rollers **18** adapted to cooperate with the roll in the manner described hereinafter.

The roll **15** has a section **20** adjacent each end thereof which increases in diameter towards the respective end of the roll where the section is located. These sections are generally conical as shown, but, instead of tapering along a straight line, may be flared along a curved line disposed in a plane passing through the longitudinal axis of the roll. These sections are positioned in the zone along the bed of the knitting machine where the respective ends of the knitting line are located, whereby the selvages of the fabric, indicated in broken lines S, and the portions of the fabric adjacent thereto pass over the sections (Fig. 1). The sections **20** may be formed integral with the roll **15** or may be in the form of sleeve-like elements, as shown herein, which are secured to the roll by suitable means to permit lengthwise adjustment thereof on the roll, so that, the sections can be positioned to receive the selvages in the event only portions of the knitting elements are utilized to produce fabric of various widths.

The roll **15** also has a smooth cylindrical section **21** intermediate the conical sections **20** over which the fabric is adapted to pass. While only a small portion of the section **21** is shown, the length of this section is almost equal to the length of the knitting line K which may be from eight to fourteen feet or more, for example.

The end supports **16** include a plate **22** having a bearing **24** for rotatably receiving the ends of the roll **15** (Fig. 2), and upright rod structure **25** mounted on the base of the knitting machine frame (not shown) for supporting the plates **22** thereon.

The intermediate supports **17** include a bracket **26** having a bearing **27** at the upper end thereof (Fig. 3), and upright rod structure **29** mounted on the base of the knitting machine frame (not shown) for supporting the

bracket 26 thereon. The bearing 27 has an upwardly facing arcuate surface for receiving a portion of the cylindrical roll section 21 to rotatably support the same. While only one support 17 is shown herein, it will be understood that a number of such supports are utilized which are so spaced that the section 21 cannot sag anywhere along its length when pressure is applied thereon by the fabric in passing thereover from the knitting line to the take-up means.

Each roller 18 is mounted on a shaft 30 which is parallel to the axis of the roll 15, the shaft being supported at its outer end by an arm 31 fastened to the plate 22 by bolt means 32. The arm may have a slot 34 therein for receiving the bolt means to facilitate adjusting the roller 18 with respect to the roll sections 20. The rollers are mounted for rotation, preferably about their shaft, but, if desired, the shafts may be rotatably supported by the arms 31 and the rollers may be rotatable with their shaft. However, as shown, each roller 18 is rotatably retained between a pair of collars 35 secured to the shaft 30 in a manner to facilitate adjusting the lengthwise position of the roller on its shaft to properly bear against the section 20 adjacent thereto.

In the event the sections 20 are conical as shown, the rollers 18 may be formed with fabric engaging surface 36 which is parallel to the surface of the adjacent section 20 (Fig. 1).

In operation, the fabric F, in leaving the knitting line K, passes over the roll 15, under the idler roll I and is wound on the take-up roll T. The portion of the fabric adjacent its selvages S passes over the conical sections 20, and the rollers 18 engage and bear against the fabric along a line adjacently spaced from the selvages, whereby the fabric is pinched at the line of engagement between rollers 18 and the sections 20 to prevent crosswise contraction of the fabric and to maintain the width of the fabric about equal to the width of the fabric produced at the knitting line. In practice, it has been found that contraction of fabric produced on a fourteen foot length of knitting elements can be reduced to a few inches at each selvage. As a result of so minimizing contraction of the fabric, the zones of the fabric adjacent the selvages are maintained smooth, and the thickness of these zones is substantially the same as the thickness of the intermediate fabric, whereby even winding of the fabric on the take-up roll is facilitated and prior winding difficulties are overcome.

As the fabric is taken up, the roll 15 and the rollers are rotated freely by the fabric frictionally engaging the same without any tendency to impair the fabric at the points of engagement by the rollers 18 and the sections 20.

In order to further minimize the tendency of the fabric to contract crosswise, the sections 20 preferably are covered with a material or are provided with a surface 37 (Fig. 4) which promotes the frictional grip between the fabric and the sections 20, but without impairing the fabric, whereby the tendency of the fabric adjacent the selvages to slide inwardly on the conical sections is overcome. Such a surface may be provided by a layer of cork, plastic or tape having a relatively high coefficient of surface friction. If desired, the rollers 18 may have similar friction means on the surface 36 thereof to further minimize any tendency of the fabric to slip inwardly at the pinch points between the rollers 18 and sections 20.

Preferably, the roll section 21 is provided with a surface or covering 38, similarly to the surface 37. However, the surface 38 is interrupted at the zones along the length of the roll section 21 which are supported by the bearings 27.

As shown in Fig. 5, the rollers 18 may be positioned below the roller 15 so that the fabric is wrapped around the roll 15 for at least about a half turn, whereby the selvages are held even more effectively to prevent inward contraction thereof.

From the foregoing description, it will be seen that the present invention provides novel and useful fabric take-up assisting apparatus for warp knitting machines which can be economically installed on new machines or can serve as a replacement for the conventional rod on existing machines.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

I claim:

1. In a warp knitting machine, the combination of knitting elements providing a knitting line, an elongate fabric supporting roll adjacent and parallel to the knitting line of said elements over which the fabric passes, said roll having a section at each end extending beyond an end of the knitting line, said sections increasing in diameter from adjacent the selvages towards the respective end of the roll where such section is located, means for rotatably supporting said roll, and means at only each of said sections for engaging the fabric adjacent the selvages thereof and being positioned to hold the fabric against said sections.

2. The structure according to claim 1, wherein said sections have means thereon for frictionally gripping the fabric.

3. The structure according to claim 1, wherein a cylindrical section is located intermediate said end sections, and bearing means are providing for rotatably supporting said cylindrical section.

4. The structure according to claim 1, wherein said fabric engaging means are located beneath said roll and in nearly vertical alignment therewith, and fabric taking-up means are located below said fabric engaging means, whereby, when the fabric is passed over said roll, between said roll and said fabric engaging means and about said fabric engaging means, the fabric is wrapped around said sections for at least about a half turn.

5. The structure according to claim 1, wherein said fabric engaging means are rollers.

6. The structure according to claim 5, wherein the axes of rotation of said rollers are located below the axis of rotation of said roll and in nearly vertical alignment therewith, and fabric taking-up means are located below said rollers and outwardly thereof with respect to the knitting line, whereby, when the fabric is passed over said roll, between said roll and said rollers and about said rollers, the fabric is wrapped around said end sections for at least about a half turn.

7. The structure according to claim 5, wherein said end sections are conical and said rollers have a surface parallel to the surface of said conical section adjacent thereto.

References Cited in the file of this patent

UNITED STATES PATENTS

1,005,801	Birch	Oct. 17, 1911
1,685,873	Evans et al.	Oct. 2, 1928
2,276,791	Palmer	Mar. 17, 1942

FOREIGN PATENTS

1,613	Great Britain	of 1866