

July 3, 1928.

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J. A. WILLARD

YARN DIRECTOR FOR KNITTING MACHINES

Filed April 14, 1927

2 Sheets-Sheet 1

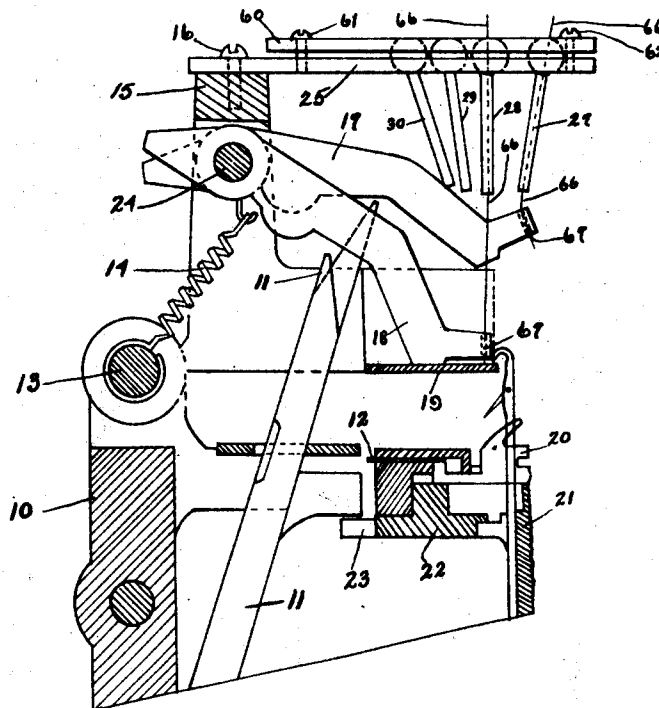


Fig. 1

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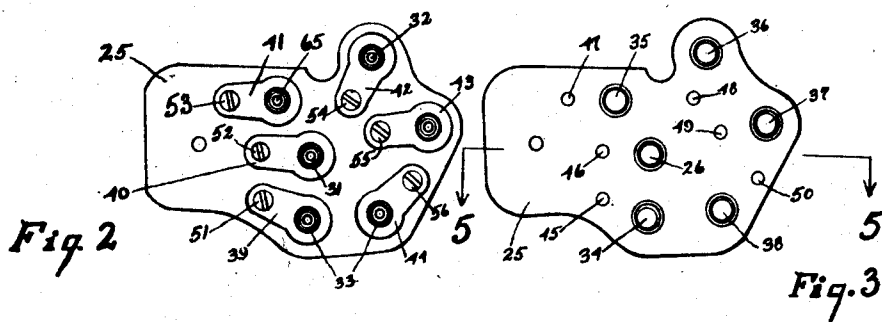
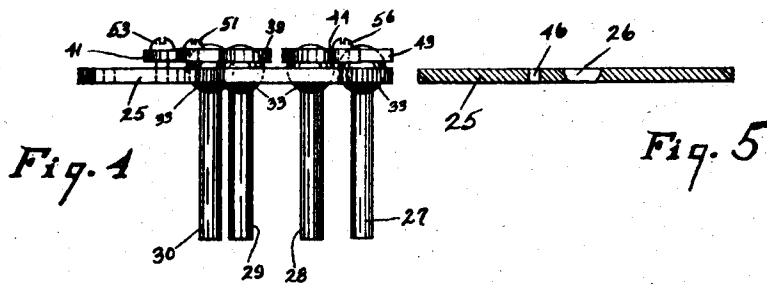
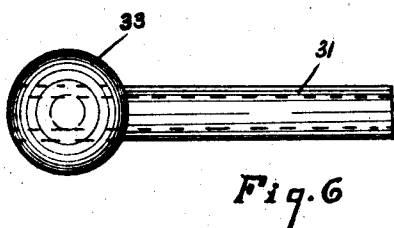
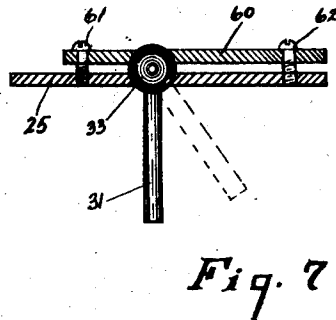
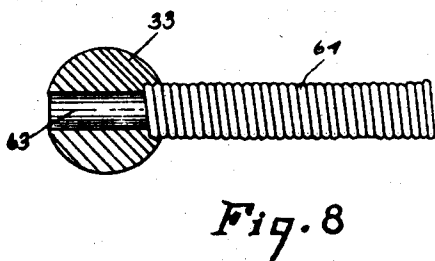
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YARN DIRECTOR FOR KNITTING MACHINES

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2 Sheets-Sheet 2



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Patented July 3, 1928.

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UNITED STATES PATENT OFFICE.

JAMES A. WILLARD, OF GREENSBORO, NORTH CAROLINA.

YARN DIRECTOR FOR KNITTING MACHINES.

Application filed April 14, 1927. Serial No. 183,794.

My invention relates to means for directing the thread in knitting machines to the yarn guides in such a manner as to prevent the threads from becoming entangled.

5 Heretofore certain knitting machines of the rotary type which are used for knitting hosiery have been provided with means for guiding the yarn to the yarn guides which feed the same to the needles of the knitting machine, but these have failed to prevent the
10 yarn from becoming entangled with other strands of yarn, and as a result causing seconds in the manufactured article.

During the knitting process by proper
15 manipulation of the yarn feeding fingers different types and colors of yarn are fed to the needles, and when there is a change made in the color of the yarn supplied to the needles or in changing from straight knit-
20 ting to the heel or toe, certain yarn guides are raised out of communication with the needles, and when the yarn guides are raised the yarn becomes slackened and will fall over and become entangled in another strand
25 of yarn and the triple strand of yarn will then be drawn to the needles and defects in the knitted article will result.

It is an object of my invention to provide means for directing the yarn to the yarn
30 feeding fingers in such a manner as to prevent the different threads of yarn from becoming entangled with each other.

Some of the objects of my invention having been stated, a brief description of the
35 different figures of the drawings will now be given in which—

Figure 1 is a cross sectional view through a portion of a knitting machine, showing the yarn guides, and showing my yarn directing means attached to the machine;
40

Figure 2 is a plan view of a modified form of my invention showing the yarn directing members individually secured in position;

Figure 3 is a plan view of Figure 2 with the yarn directors and the fastening means therefor removed;

Figure 4 is a side elevation of the structure shown in Figure 2;

Figure 5 is a cross sectional view taken
50 along the line 5—5 in Figure 3;

Figure 6 is an enlarged view of one of the yarn directing tubes and the ball associated therewith;

Figure 7 is a cross sectional view of one of the yarn directors secured in position be-
55 tween the upper and lower plates;

Figure 8 is an enlarged view of one of the yarn directors partly in cross section showing the directing means made of a coil spring.

Referring more particularly to the draw-
60 ings in Figure 1 I have shown the upper portion of a circular knitting machine of one of the standard makes which has the standard 10 thrust bar 11, and cam 12, the latchguard ring pivot 13, the latch ring finger springs
65 14, the latchguard ring 15, the latch ring yarn director screws 16, the yarn guides 17 and 18, the throat plate 19, the web holder 20, the rotary needle cylinder 21, the web holder bed 22, the cam 23, and the yarn
70 finger pin 24.

These parts which have been enumerated are the conventional parts and are not a part of my invention, hence a further description of the same is not deemed necessary.

To the latch guard ring 15 I secure the plate 25 by means of the screw 16 which projects outwardly over the yarn guides 17 and 18. In Figure 1, I have shown only two
80 yarn guides, but I desire to be understood that my yarn directing means may be used with a machine having any given number of yarn guides. This plate 25 has a plurality of holes 26, which are semispherical in contour with their poles flattened as is clear in
85 Figure 5. Into these holes 26 I drop a plurality of tubes 27, 28, 29, 30, 31, and 32. These tubes pierce balls such as 33, and are rigidly secured in these balls. These balls
90 such as 33 rest in the holes 26, 34, 35, 36, 37, and 38, and fitting over these balls are the smaller plates 39, 40, 41, 43, 43, and 44. Holes 45, 46, 47, 48, 49, and 50 are drilled in the plate 25, and are interiorly threaded to receive the bolts 51, 52, 53, 54, 55, and 56,
95 which bolts pierce the smaller ends of the plates which holds the balls in place. These plates 39 to 44 have semispherical cavities with their poles flattened similar to the cavity 26 shown in Figure 5. These semi-
100 spherical cavities fit over the upper portions of the balls as shown in Figures 2 and 4.

If desired, instead of using the individual plates for adjusting and holding the balls on the yarn directing tubes in place, I can use
105 a unitary plate 60 which is secured to the plate 25 by means of the bolts 61 and 62, but the advantage of the individual plate is that one of the plates may be loosened and the angle of the yarn directing tube adjusted
110 without interfering with the adjustment of any of the other yarn directing tubes. In

Figure 7, I have shown in dotted lines how the yarn directing tubes may be swung and adjusted in the dotted line position or in any other position.

5 In Figure 6 and also in the other figures with the exception of Figure 7 I have shown the yarn directing tubes made of a continuous steel tube, but I desire to be understood that the tube and the ball may be
10 made of one piece out of porcelain or any other suitable material, and in case of the tube and balls being made of porcelain, then I find it preferable to have the plates 25, 60, 39 to 44 made of fibre rubber or other
15 suitable material which will have some resiliency thereto to prevent the porcelain balls from being broken.

In Figure 8, I have shown the ball 33 made of steel with a hole 63 therethrough, which hole is enlarged at its lower end, and in the enlarged portion there is secured by welding or other suitable means the coil spring 64, and when this coil spring is used, the yarn directing means may extend into
25 closer proximity to the yarn guides without interfering with the operation of the yarn guides.

The interior of the tubes can be seen in Figure 2, such as is indicated by the numeral 65. The thread 66 is received from the tensioning means of the knitting machine and runs through the yarn directing means to the eye 67 in the yarn guides.

It is thus seen that I have devised means
35 for directing yarn to the yarn guides in knitting machines so as to prevent the yarn from intermingling when a change occurs in the knitting process, and one in which it is practically impossible for a machine so
40 equipped to produce seconds due to this common occurrence of the yarn becoming entangled with other strands of yarn and drawing both strands through the wrong yarn guide.

45 In the drawings and specification I have set forth a preferred embodiment of my invention, and altho specific terms are used, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. A yarn directing device for knitting machines adapted to be secured above the
55 yarn changers, comprising a plate having a plurality of bowl-shaped perforations therein, balls adapted to rest in the bowl-shaped holes, a hole through the balls, a tube secured to the lower portion of the balls and extending downwardly, a plate
60 having inverted bowl-shaped holes therein and being adapted to fit over the balls and having means for being adjustably secured to the lower plate.

65 2. In a knitting machine, means for in-

70 suring an uninterrupted and unaccompanied travel of each strand of yarn to the yarn changing fingers, said means comprising a plurality of tubes, said tubes being pivotally secured at their upper ends to a plate and being capable of being swung laterally in any direction.

3. In a knitting machine, means for individually receiving the strands and guiding them to the eyes of the yarn, changing devices, said means comprising a plurality of tubes pivoted at their upper ends for universal lateral movement, and being capable of being adjusted in any desired position.

4. A yarn directing device for knitting
80 machines, comprising a plurality of downwardly projecting laterally adjustable hollow members through which the yarn is adapted to pass on its way to the yarn feeding means, said hollow members being
85 adapted to be independently adjusted in any desired position to deliver the yarn to the proper yarn changing device.

5. In a knitting machine, means for directing the yarn into close proximity with the eyes of the yarn feeding device, said means comprising a plate, bowl-shaped cavities in the upper side of the plate, a hole in the bottom of each bowl-shaped cavity, tubes adapted to fit into said hole, a ball on the upper end of the tubes, a plate having an inverted bowl-shaped cavity therein adjusted to fit over the upper side of said ball, means for securing the last named plate to the first plate to hold the tubes in adjusted position.

6. In a knitting machine a horizontally disposed member secured to the latch guard ring and having a plurality of bowl-shaped holes therein, a plurality of tubes having a ball secured around their upper end and adapted to fit into the bowl-shaped holes individual means for applying pressure to the upper face of the balls to hold the tubes in adjusted position.

7. In a knitting machine, a plate secured to the latch guard ring, a plurality of holes in said plate, a plurality of vertically disposed tubes mounted in said holes, the lower ends of the tubes being adapted to project into close proximity with the yarn changing devices, a ball secured to the upper ends of the tubes, means for securing the tubes to said plate to allow universal lateral movement to the lower ends of the tubes, and means for adjusting the tubes after the same have been swung to any desired position.

8. In a knitting machine, a plurality of vertically disposed and universally laterally adjustable tubes mounted in a plate secured to the latch guard ring and means associated with said plate for holding the tubes in adjusted position.

In testimony whereof I affix my signature.
JAMES A. WILLARD.