

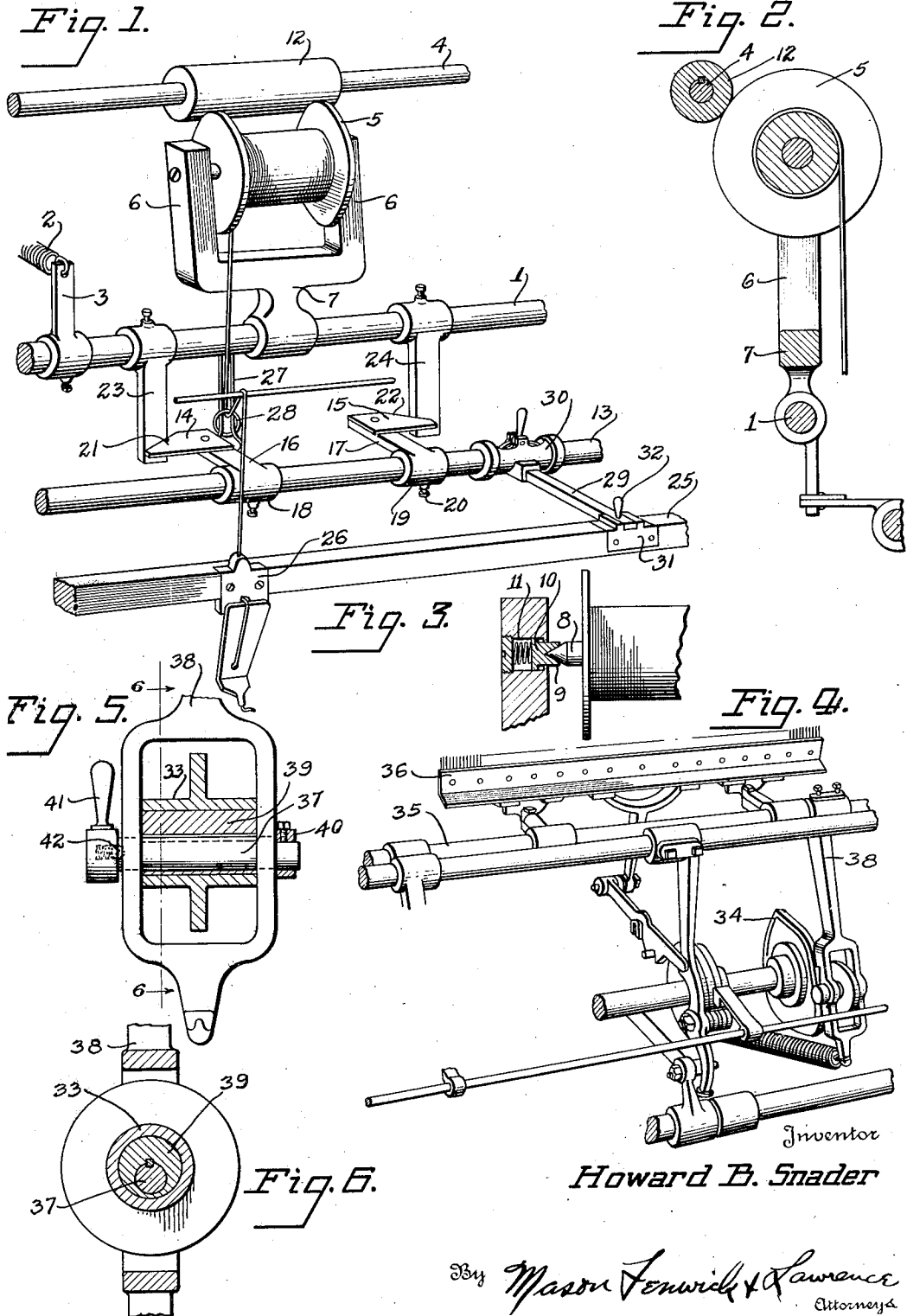
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FULL FASHIONED HOSIERY KNITTING MACHINE

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FULL FASHIONED HOSIERY KNITTING MACHINE

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679,805, now Patent No. 1,929,006. Divided and
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690,451

1 Claim. (Cl. 66—82)

This invention relates to improvements in full fashion hosiery knitting machines and it is a division of my co-pending application Serial No. 679,805, filed July 10, 1933.

Said application describes and claims a full fashioned hose having a strain absorbing zone between the knee and welt comprising courses of covered elastic rubber thread integrally knit with the adjacent portions of the stocking and which are knit from a different and less elastic thread. The change from inelastic to elastic and back to inelastic thread necessitates that a covered elastic rubber thread be presented to the needle bar periodically and withdrawn therefrom at points corresponding to the beginning and ending of the rubber elastic courses, and that the stitch length be adjusted at the beginning of the knitting of the elastic courses, and adjusted back again when the knitting of the relatively inelastic thread is resumed. Known knitting machines are not adapted for this purpose. They must be stopped and a slow adjustment made before any change in the length of the stitch can be effected. This makes it impracticable to knit the hose of my aforementioned application with a knitting machine as at present constructed, but by the present invention the knitting of such hosiery becomes eminently practicable.

One of the objects of the invention is to provide means for feeding the elastic rubber thread to the needle bar and means for determining the limits of the courses through which it is fed.

Another object of the invention relates to quick means for adjusting the stitch length at the beginning and end of the elastic courses.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawing which accompanies and forms a part of the following specification, and throughout the several figures of which the same characters of reference have been employed to denote identical parts:

Figure 1 is a perspective view showing the feeding mechanism for the elastic rubber thread;

Figure 2 is a cross section through certain parts of the feeding mechanism;

Figure 3 is a detail view partly in section and partly in vertical elevation showing the yielding spool holding mechanism;

Figure 4 is a perspective view showing the means for making quick adjustment of the stitch length and appurtenant parts;

Figure 5 is a cross section through the adjusting mechanism; and

Figure 6 is a section taken along the line 6—6 of Figure 5.

Referring now in detail to the several figures, Figure 1 shows means for automatically feeding the covered latex rubber thread and for controlling its tension and for bringing it into and out of action. This mechanism which is applied as an adjunctive to the regular knitting machine comprises an oscillating bar 1 which extends longitudinally of the entire knitting machine, but only enough of which is shown here to serve one station. This bar is kept normally biased in the unreeling position by means of a spring 2 anchored at one end to any fixture and at the other to a lever 3 secured to the bar 1. A constantly rotating shaft 4 extends lengthwise of the entire machine, the function of which is to effect the positive unreeling of the covered elastic thread from the spool 5, it being understood that a spool is provided for each station. The spool is journally mounted between the arms 6 of a bracket 7 connected to the bar 1 and partaking of the oscillatory movements thereof. The spool may be provided with a spindle, the projecting ends 8, one of which is shown, being received in seating recesses 9 on the inner faces of the arms 6 of the bracket. One of these recesses is provided in a depressible seat member 10 so that the spool may be readily inserted between the arms of a bracket by first pressing the extended end 8 of the spindle against the depressible seat member 10 until clearance is obtained for the opposite end of the spindle, whereupon pressure upon the end 8 may be released and the spring 11 behind the depressible seat 10 will hold the spool from accidental displacement. A driving element 12 on the shaft 4 imparts rotation to the spool.

The knitting machine is provided with a shaft 13 reciprocating endwise through a distance corresponding to the width of the stocking blank. For the purpose of the present invention, cam plates 14 and 15 are mounted on said shaft at the ends of lugs 16 and 17 formed on the sleeves 18 and 19 which are adjustably secured to the shaft by means such as the set screws 20. The cam plates have inclined edges 21 and 22 adapted to engage levers 23 and 24 adjustably mounted on the oscillating bar 1. When the shaft 13 moves to the leftward the lever 23 is rocked, which oscillates the bar 1 and draws the conical spool out of contact with the driving element 12. This interrupts the feeding of the latex thread from the spool 12 and takes place at one of the limits of the elastic zone of the stocking. When the shaft 13 has reciprocated to its limit in the oppo-

site direction, the inclined edge 22 of the cam engages the lever 24 and again oscillates the bar 1 withdrawing the spool from its operative relation to the element 12 and interrupting the feed at the opposite end of the elastic zone of the stocking. Between these limits the bar 1 is drawn back under the bias of the spring 2 maintaining the rotating mechanism for the spool 5 in engagement with the element 12, feeding the latex.

A bar 25 is mounted in front of the sinker heads of the knitting machine, slidable longitudinally and supports a carrier 26. Thread from the spool 5 is passed through a tensioning device 27 of usual construction, including the weight 28 in the form of a ring through which the covered latex thread is looped, the thread then passing through suitable apertures in the carrier. The bar 25 is disconnectably coupled to the reciprocating shaft 13 by means of a latch 29 mounted on a friction sleeve 30 which surrounds the shaft 13 and is displaceable both circumferentially and longitudinally of said shaft, but which normally is held frictionally to said shaft so as to reciprocate therewith. The latch 29 fits into a keeper 31 on the sliding bar 25 from which it may be lifted by means of a handle 32 when it is desired that the bar 25 shall not operate. The carrier passes along the row of needles in the needle bar and supplies the covered latex thread to said needles.

The mechanism which changes the length of the stitch at the beginning and end of the elastic courses is shown in Figures 4, 5 and 6, inclusive, and it concerns itself with the adjustability of the cam roller 33 relative to the actuating cam 34 by means of which the range of oscillation of the shaft 35 is varied, giving greater or less forward movement to the needle bar 36. It is of course elemental to those skilled in the art that it is the forward movement of the needles which lengthens the loops of the thread. Customarily, the adjustment is made by moving the cam roller toward or away from the cam by loosening certain nuts at the ends of the pin on which the roller revolves and translating said pin forwardly or backward through the action of certain set screws.

In the ordinary operation of knitting full fashioned hosiery, it is never necessary to change this adjustment unless the looseness or fineness of the mesh has to be changed, that is to say, for different lots or styles of stocking and the complication of the adjustment is not vital in view

of the infrequency within which it has to be made. In the present instance however where it is necessary to start out with a relatively small stitch length, to increase this stitch length at the beginning of the knitting of the covered rubber thread, and to decrease it again at the end of the knitting of the rubber thread, the need for a quick adjustment becomes imperative.

The present invention therefore contemplates a simple and efficient adjusting mechanism comprising a pin 37 adapted to pass through aligned apertures in the sides of the eye of the needle bar arm 38. An eccentric bushing 39 is fixed to said pin within said eye and affords a journal for the cam roller 33. The collar 40 is exemplary of any known means for retaining the pin 37 against slipping endwise through the apertures in the sides of the eye of the needle bar arm, and a handle 41 on the opposite end of said pin permits rotation of the pin so as angularly to displace the eccentric bushing 39 bringing its throw closer to or farther away from the cam 34 and thus advancing or retracting the cam roller 33 with respect to said cam. A ball detent 42 or other equivalent detaining means may be provided for fixing the handle in any desired position of adjustment.

While I have in the above disclosure described what I believe to be preferred and practical improvements in knitting machines and in the knitted product for which the improvements are particularly designed, it is to be understood that the specific details of construction as shown and described are merely by way of example and not to be construed as limiting the scope of the invention as claimed.

What I claim is:

Stitch length adjusting means for knitting machines comprising in combination, an actuating cam, a needle bar arm having an eye with its opening in the plane of rotation of said actuating cam, of a journal mounted eccentrically in the eye of said needle bar arm, a cam roller revolvably mounted on said journal, and a handle including a detent for holding the handle in any position to which it may be shifted, for shifting the throw of said eccentric journal to vary the distance of the axis of rotation of said roller from the cam which determines forward and backward movement of said needle bar.

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