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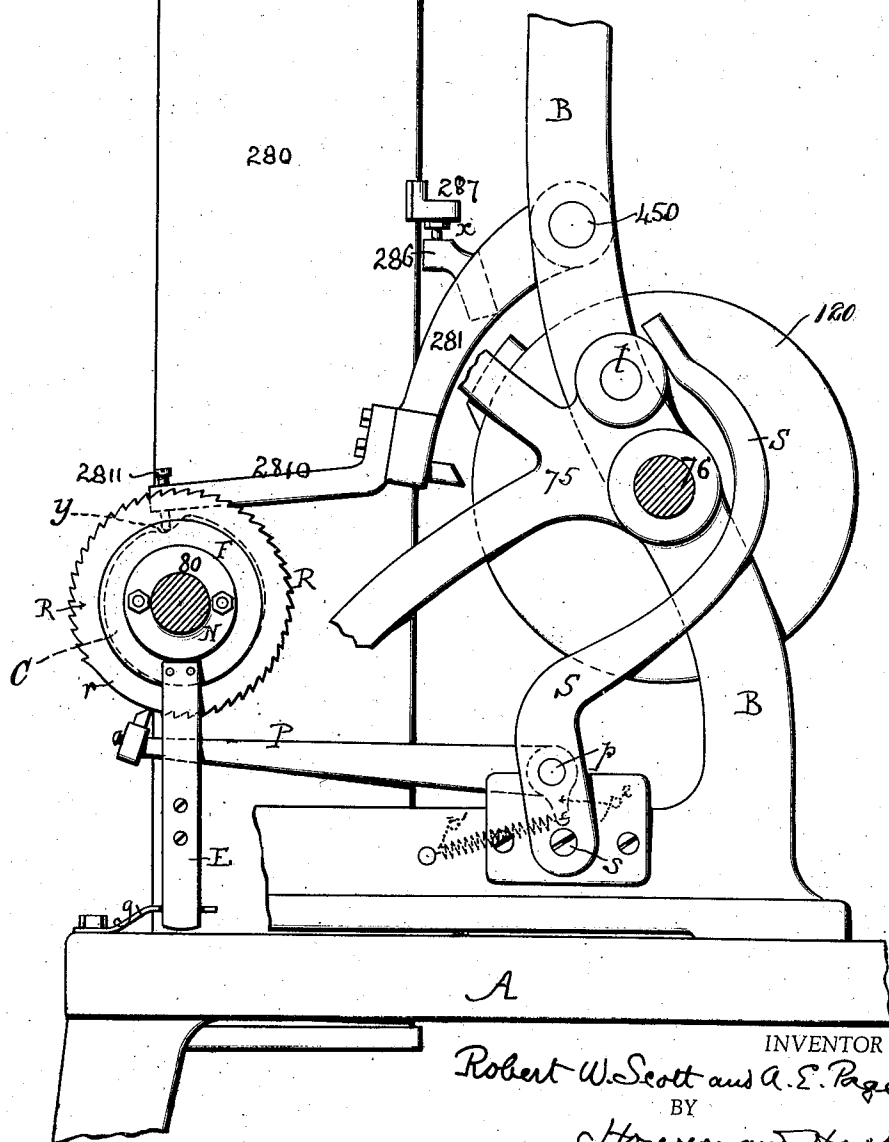
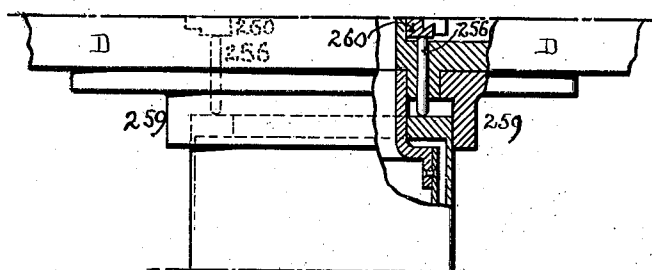
1,569,632

R. W. SCOTT ET AL

STITCH REGULATING MEANS FOR KNITTING MACHINES

Filed Dec. 21, 1922

3 Sheets-Sheet 1



INVENTOR

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Jan. 12, 1926.

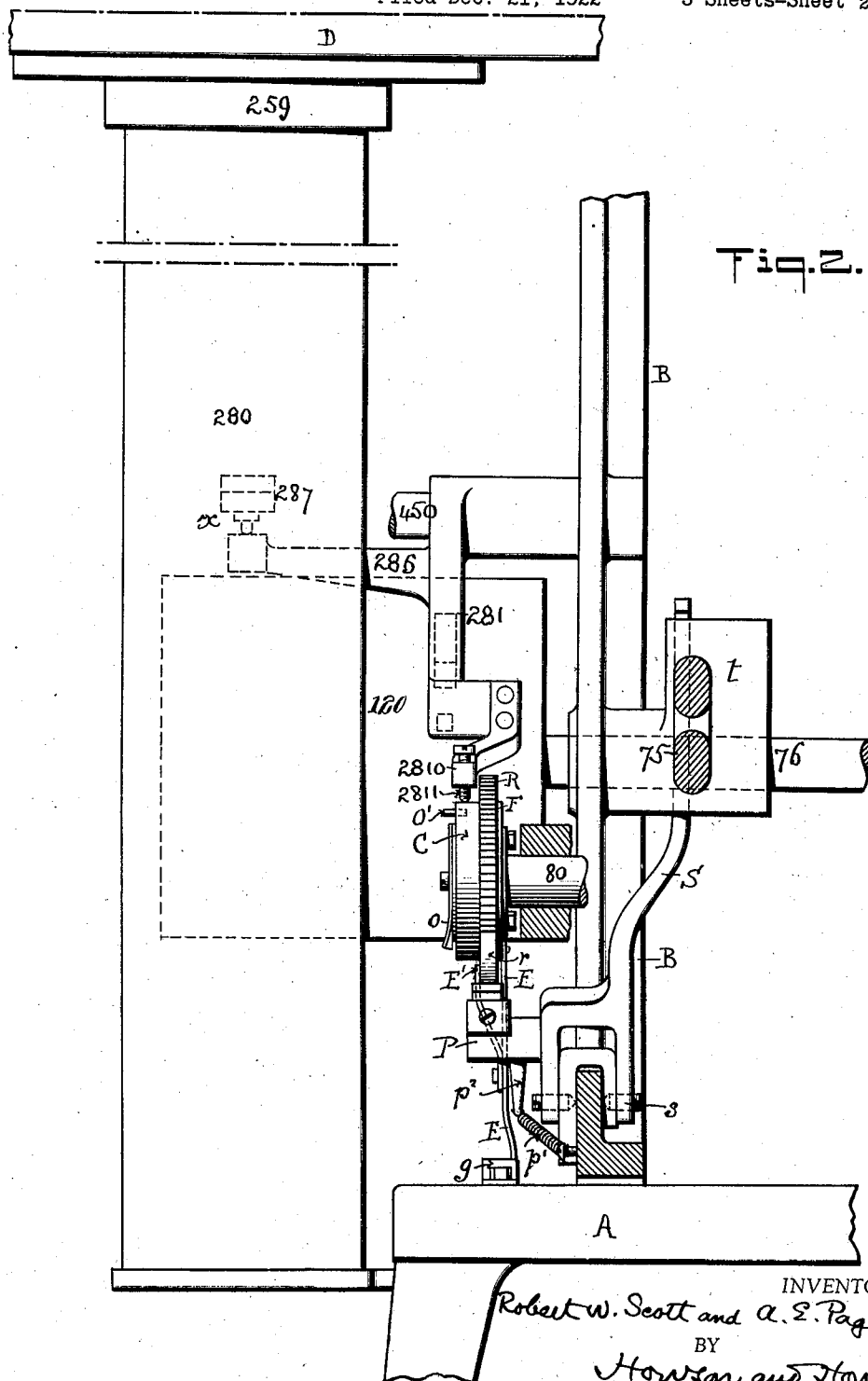
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STITCH REGULATING MEANS FOR KNITTING MACHINES

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3 Sheets-Sheet 2



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STITCH REGULATING MEANS FOR KNITTING MACHINES

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3 Sheets-Sheet 3

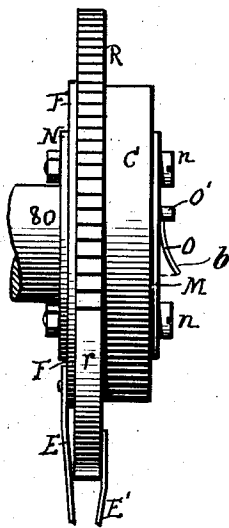


Fig. 5.

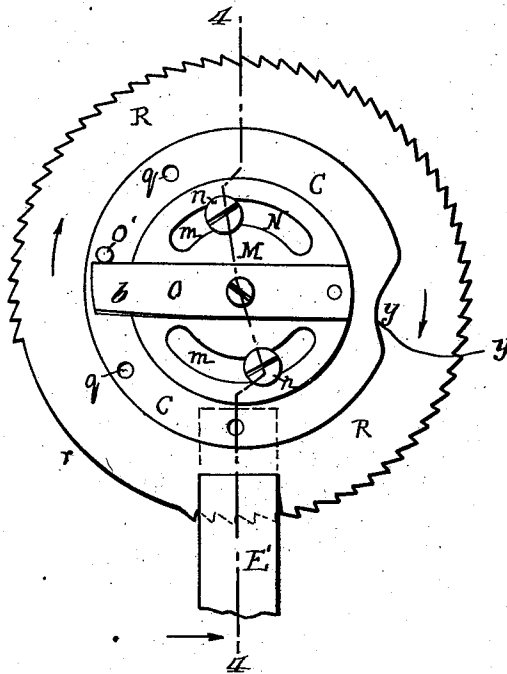


Fig. 3.

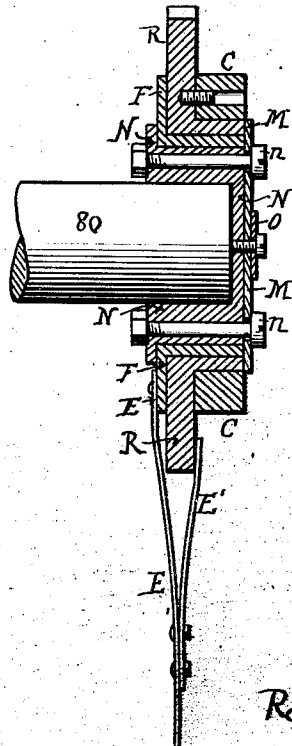


Fig. 4.

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UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF BABYLON, AND ALBERT E. PAGE, OF BROOKLYN, NEW YORK,
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STITCH-REGULATING MEANS FOR KNITTING MACHINES.

Application filed December 21, 1922. Serial No. 608,196.

To all whom it may concern:

Be it known that we, ROBERT W. SCOTT, a citizen of the United States, residing at Babylon, in the county of Suffolk and State of New York, and ALBERT E. PAGE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Stitch-Regulating Means for Knitting Machines.

The main object of our invention is to provide a simple and effective means for automatically regulating the length of the stitches or knitted loops in the formation in the knitting on a knitting machine, independently of the main pattern means, which control the other automatic movements of the machine. Our invention has been designed more particularly for use on circular knitting machines and is especially useful in such machines for knitting seamless hosiery for women's wear, in which it is important to shorten the length of the stitches or knitted loops from the upper part of the leg down to the ankle, in order to give the desired shaping or fashioning to the stocking below the calf of the leg.

In the well-known Scott and Williams circular hosiery knitting machine, of which an example is illustrated in the Scott Patent No. 1,152,850, Sept. 7, 1915, this change in stitch length is brought about by a vertical adjustment of the needle cylinder effected from the main pattern drum. In the machine shown in the mentioned Scott patent this adjustment of the needle cylinder was accomplished through the medium of a lever acting upon the vertical hollow column, through which the knitted fabric passes down from the knitting, the needle cylinder being supported vertically in part by this hollow column.

In the development of the modern hosiery circular knitting machines, so many different automatic motions have to be effected or controlled by cams on the main pattern drum that it is difficult to get a sufficient number of cams on the drum properly timed with reference to each other. By our invention we relieve the pattern drum of the duty of regulating the stitch length and this we accomplish by providing a simple mechanism which is actuated independently of the drum to automatically effect the vertical ad-

justment of the needle cylinder to change the length of stitches at the desired times during the operation of the machine, as we will now describe.

In the accompanying drawings we have shown our invention as applied to a Scott and Williams hosiery knitting machine of the same general construction as is disclosed in the above mentioned Scott patent, but it will be understood that the invention may be embodied in other constructions of knitting machines.

Figure 1 is a side elevation, partly in section, of sufficient of such a machine to illustrate our improvements:

Fig. 2 is a front view, partly in section:

Fig. 3 is an end view of the ratchet feed wheel for the stitch control:

Fig. 4 is a sectional view of the ratchet wheel:

Fig. 5 is a side view of the same.

In these views, a part of the lower framework of the machine is represented at A, while at B is indicated one of the side frames supporting at their upper ends the bed plate D, in which is mounted the rotary knitting head, and at 120 is indicated the pattern drum all of which may be of the same general character as disclosed in the above mentioned Scott patent, and more fully in the Scott Patent No. 1,189,220, dated June 27, 1916. In these drawings, we have used the same letters and numerals of reference which were used for the like parts in both those Scott patents.

The tubular column 280, through which the knitted fabric passes down from the knitting head, is guided at its upper end in a pendent flange 259 in the under side of the bed plate D and can be vertically adjusted therein, in order to impart vertical adjustment to the needle cylinder through the medium of vertical supporting pins 256 as indicated in Fig. 1, and as fully shown and described in both the before mentioned patents of Scott.

The immediate means for raising the column 280, includes a lever 281 pivoted at 450 to the side frames B and having a laterally projecting arm 286 on which rests a lug 287 secured to the exterior of the hollow column 280, through an adjustable screw 288.

This supporting lever 281 has in the present instance an extension 2810 with an ad-

justable bearing screw 2811 to rest upon the periphery of a cam C which is carried by, but is free to turn with reference to the intermittently rotated shaft 80 which in the Scott and Williams machine is known as the pattern cam shaft.

This pattern cam shaft 80 is racked intermittently through a pawl and an irregular toothed rack wheel whose effective action is determined by the lugs on the pattern chain, as described in the above mentioned Scott Patent 1,152,850.

Attached to this cam C is a ratchet wheel R, by means of which this cam may be rotated intermittently. Such intermittent feed motion may be imparted to this ratchet wheel R and therefore to the cam C by means of a reciprocating feed pawl P, which is pivoted at *p* to a rocking arm S, this latter being pivoted to the side frame B at *s*. A spring *p'*, connected at one end to the side frame and at the other to an arm *p''* of the pawl P, tends to press the acting end of the pawl P into engagement with the periphery of the ratchet wheel at all times.

The free end of the rocking arm S bears against a hub *t* on the usual rocking quadrant 75 of the Scott and Williams machine. This quadrant 75 is oscillated on the center 76 in the side frames B of the machine in the usual manner. The spring *p'* tends to keep the end of the arm S thus in contact with the rocking arm 75.

The periphery of the ratchet wheel R has a long tooth or idling space *r*, on which the acting end of the pawl P can idle back and forth at the time when desired, as for example, during the knitting of the foot of the stocking.

In order to thereafter bring the toothed part of this ratchet wheel R into the path of the reciprocating pawl P, we provide the following means:—

To the end of the intermittently rotated pattern cam shaft 80 is secured a cap N, to the outer end of which is secured a plate M carrying a spring blade O, whose free outer end projects beyond the plate M, and is adapted to contact with a pin O' on the side face of the cam C. When the ratchet wheel R is stationary during the time the pawl P is idling on the face *r* of the ratchet, this spring blade O turning with the shaft 80 will come into contact with the pin O' on the cam C and turn the latter and the ratchet wheel R in the direction of the arrow, Fig. 3, until the reciprocating pawl P engages the first teeth beyond the idling part *r* and begins to turn the ratchet and cam away from the blade O. The pattern cam shaft 80 is racked around at irregular intervals in unison with the pattern drum 120, each making one complete revolution for one revolution of the pattern chain, i. e., for each article knit. Since the pattern

drum is racked only when changes in the knitting are desired and therefore may not be moving when changes in stitch length are desired, the shaft 80 cannot be availed of to drive the cam. However, the shaft can be used to bring the toothed part of the ratchet wheel into the path of the reciprocating pawl at the proper time and then the pawl P can be used to produce the faster and regular drive of the cam necessary to produce the proper change of stitch length of the leg.

During the time that the feed pawl P is idling on the part *r* of the ratchet wheel R, the pin 2811 of the pivoted arm 281 may be resting in the depression *y* of the cam C, permitting the needle cylinder to occupy its lowest position for the formation of the short stitches. When the blade O has turned the ratchet R and cam C to bring the feed pawl P to engage the teeth of the ratchet, the pin 2811 on the arm 281 will be resting on the highest part of the cam C and the needle cylinder will be raised to its highest position to form long stitches at the top of the stocking. This arrangement is predicated upon the assumption that the stocking is to be knit from top to toe, but of course, the reverse arrangement may be provided, and the cam C constructed accordingly. As shown, the cam C is arranged to let the needle cylinder descend and so shorten the stitches, as will readily be understood.

The plate M with its blade O is preferably made rotarily adjustable on the cap N, by having headed clamping screws *n*, *n* passing through segmental slots *m*, *m* in the plate and secured to the cap N. Likewise the pin O' is made adjustable, by threading its inner end so that it may be fitted into any one of a series of holes *q* in the side face of the cam C.

We prefer to bend the free outer end of the blade O to produce a bevel *b*, Figs. 3 and 5, so that in case the parts get out of time and it becomes necessary to turn the ratchet wheel by hand, the pin O' may pass under the beveled end of this spring blade O, and raise the latter until the pin O' has passed beyond the blade to its proper position.

Instead of mounting the ratchet wheel R and cam C to turn directly on the shaft 80 or its cap N, we prefer to interpose between this cap N and the cam and ratchet a flanged friction collar F (Fig. 4), to which is attached a pair of flat blades E. The free end E' of these blades bears against the side of the ratchet wheel R to prevent over-running of the latter. The blades are held stationary in any suitable way, as by having their lower end fitted into a notched plate *g*, secured to the table A of the machine.

We claim as our invention:

1. A circular knitting machine, having a frame and vertically adjustable supporting means for the knitting head to vary stitch length, in combination with a cam and devices whereby the latter acts upon said adjustable means, a pawl and ratchet feed in connection with said cam, a pattern cam shaft upon which said cam and ratchet are mounted to turn, the ratchet having idling means and devices by which said shaft may bring the ratchet feed into action again.
2. A circular knitting machine having a frame, vertically adjustable supporting means for the knitting head to vary the stitch length, an intermittently racked pattern drum and a shaft turning in unison with said drum, in combination with a cam turning freely on said shaft and devices whereby said cam acts upon said adjustable means, a pawl and ratchet feed in connection with said cam, the ratchet having an idling space, and devices fast on said shaft adapted to move said ratchet from its idling position.
3. A circular knitting machine, having a frame and vertically adjustable supporting means for the knitting head to vary stitch length in combination with a cam and devices whereby the latter acts upon said adjustable means, a pawl and ratchet feed in connection with said cam, the ratchet having an idling part, a rotating shaft on which the ratchet may turn, a blade carried by the shaft and a pin carried by the cam and ratchet, whereby the said shaft may act upon the ratchet to move it from its idling position for the purpose described.
4. A circular knitting machine, having a frame and a vertically adjustable supporting means for the knitting head to vary stitch length in combination with a cam and devices whereby the latter acts upon said adjustable means, a pawl and ratchet feed in connection with said cam, the ratchet having an idling part, a rotating shaft on which the ratchet may turn, a spring blade with a beveled end on said shaft and a pin carried by the cam and the ratchet, whereby the said shaft may act upon the ratchet but the ratchet may be turned independently of the shaft for the purpose described.

In testimony whereof we have signed our names to this specification.

ROBERT W. SCOTT.
ALBERT E. PAGE.