Feb. 23, 1926. 1,574,703

R. W. SCOTT

LATCH OPENER FOR KNITTING MACHINES

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Fig. 2.

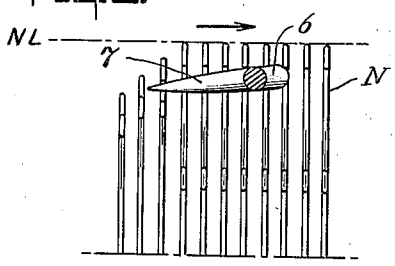


Fig. 1.

Fig. 3.

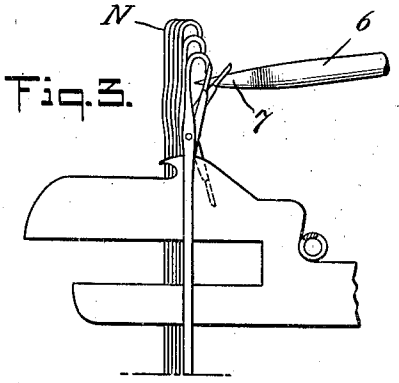
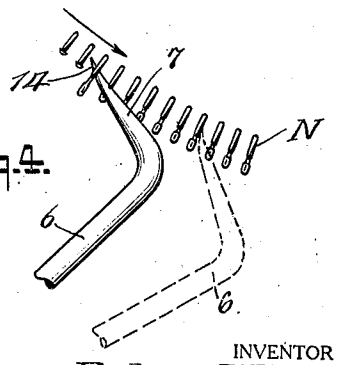


Fig. 4.



INVENTOR
Robert W. Scott
BY
Howson and Howson
HIS ATTORNEYS

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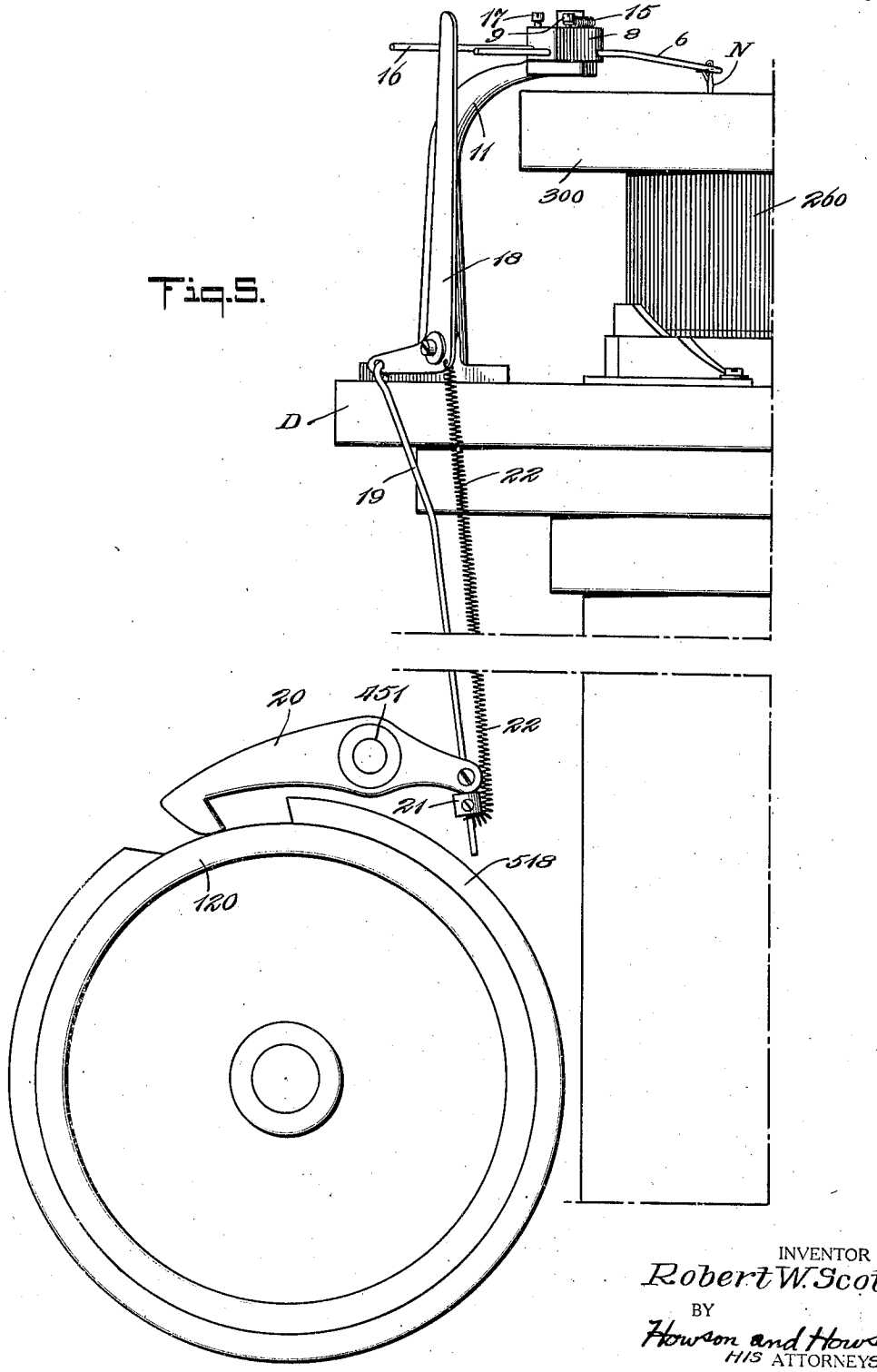
Fig.5.



INVENTOR
Robert W. Scott
BY
Howson and Howson
HIS ATTORNEYS

Patented Feb. 23, 1926. 1,574,703

UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF BABYLON, NEW YORK, ASSIGNOR TO SCOTT AND WILLIAMS, INC., OF NEW YORK, N. Y., A CORPORATION OF MASSACHUSETTS.

LATCH OPENER FOR KNITTING MACHINES.

Application filed August 4, 1923. Serial No. 655,593.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States of America, residing at Babylon, in the county of Suffolk and State of New York, have invented new and useful Improvements in Latch Openers for Knitting Machines.

My invention relates to knitting machines having latch needles and the object of my invention is to provide therefor a reliable and efficient latch opening means.

In the drawings Fig. 1 is a skeleton plan view of part of the head of a knitting machine having my latch opener attached thereto;

Fig. 2 is an elevation on an enlarged scale of a portion of the circle of needles showing how the latch opener acts upon the latches;

Fig. 3 is a radial section on an enlarged scale through the circle of needles on the line 3—3, Fig. 1;

Fig. 4 is a plan view of the same portion of the circle of needles as shown in Figs. 2 and 3; and

Fig. 5 is a skeleton elevation of the left side of the knitting machine to show the means controlling my latch opener.

It is well known that when latch needles on circular knitting machines are bare and it is desired to feed yarn to those needles to commence knitting, some means must be provided to open any latches which may happen to be shut. One common type of latch opener which has heretofore been used, especially on hosiery machines, is the rotary brush latch opener, but this type has certain disadvantages which I have overcome by the latch opener which will now be described, and which for convenience may be termed a mechanical latch opener. While my invention may be applied to various types of knitting machines using latch needles, it is especially useful in connection with high speed circular knitting machines, such as for hosiery. In the accompanying drawings I have for illustration shown the invention in the form of an attachment for a circular knitting machine of that type in which there is a revolving needle cylinder 260, carrying latch needles N.

For the latch opening member proper I provide a swinging arm 6 with a pointed tip 7 bent at about a right angle to the main portion of the arm. This swinging arm 6, lies horizontally above the sinker cap 300 with its tip 7 pointing toward the needles N as they approach it, the point of the tip just projecting under the hooks of the needles, almost up to a line drawn between the pivot point of the arm and the needle nearest thereto. I prefer to locate the tip at the point on the circle of needles where the needles in rising from the knitting wave have almost reached the normal level NL (Fig. 2), though it should be understood that I do not limit myself to that circumferential position.

The swinging arm 6 may conveniently be in the form of a wire, mounted in a block 8 and adjustably held therein by a set screw 9, the block 8 being pivoted about a center 10 on the top of a bracket 11 mounted on the bedplate D of the machine. It will now be apparent that as the circle of needles travels past the latch opener, and the tip 7 comes under the hook of any needle whose latch is closed, the latch will be thrown open quickly and positively. I prefer that the arc described by the tip should be such that it would not cross the needle circle if extended, but be tangential thereto.

To accurately adjust the position of the point of tip 7 under the hooks of the latch needles a lug 12 is provided on the swivel block 8 which acts in conjunction with an adjustable eccentric pin 13 on the top of the bracket 11 to form a stop when the tip has been swung far enough into the needle circle. The eccentric pin forms an accurate means of adjusting the point with relation to the needle circle. I prefer to form the point of the tip with a curved surface 14 (Fig. 4) such in relation to the pivoting center of the swinging arm, that if the point is hit by a bent needle or any other obstruction the latch opener will swing yieldingly before the movement of the needles and away from the needle circle on a line P (Fig. 1), the obstruction sliding across the curved surface 14 clear of the needle or other obstruction.

The tip is normally held in this operative position against the movement of the needles by a tension spring 15 which I have shown stretched between the eccentric pin 13 and the set screw 9 on the swivel block (Fig. 1), the spring being adapted to quickly return the device to operative position after allowing an obstruction to pass.

I prefer to make this spring 15 very light in order that any object such as a misplaced needle coming in contact with the surface 14 will knock the tip of the opener away from the needles rather than wedge around the tip. The angle of the surface 14 combined with the opposition of the needle to being pulled away from its trick are sufficient to swing the tip away against the slight tension of the spring. One position of the tip while being knocked clear of the needles is shown in dotted lines in Fig. 4.

A latch opener is not needed as long as the machine is knitting on needles which already have loops on them, and therefore I provide mechanism such as shown in Fig. 5 to withhold the latch opener from operative position except when yarn is about to be fed to bare needles, though other pattern controlled means can be employed. A rod 16 mounted in the swivel block 8 and held by a set screw 17 projects into the path of the vertical arm of a bell crank lever 18 pivoted at its elbow to the bracket 11. A connecting rod 19 pivoted to the end of the lower arm of this bell crank lever has a swivel connection with the arm of a lever 20 pivoted at 451 to the frame of the machine. This rod 19 passes through an opening in the lever 20 and has a collar 21 fastened on it for the actuation of the lever. The forward end of this lever 20 is adapted to ride on a cam 518 on the main pattern drum 120. A tension spring 22 may be stretched between the collar 21 and the elbow of the bell crank lever 18 in such a manner that it tends to withdraw the upper arm of the bell crank lever from contact with the rod 16 and to raise the rod 19.

It will be apparent that the pressure thus caused by tension spring 22 will tend to raise the back end of the lever 20 and keep the forward end down on the cam 518, with the result that as long as the lever 20 is riding on the cam 518 the rod 19 is depressed and the upper arm of the bell crank lever 18 is pressing against the rod 16 and holding the latch opener out of action. When the revolution of the pattern drum permits the outer end of the lever 20 to drop down off the cam 518 and onto the drum 120, the spring 22 will swing the bell crank lever 18 over causing the latch opener to swing into operative position under the tension of spring 15, (Fig. 1). By appropriate spacing of the drum cam or cams 518 the latch opener can be put into operative position at any desired point in the knitting.

It will be apparent that my device is positive, sure and efficient in action and adaptable to any kind of knitting with latch needles.

What I claim is:—

1. A knitting machine having latch needles, and a latch opener in combination with a mount for said opener permitting it to swing yieldingly before the movement of the needles and away from the needle circle.

2. A knitting machine having latch needles, and a latch opener adapted to swing in an arc tangential to the movement of the needles in combination with spring means tending to keep the latch opener in operative position against the movement of the needles.

3. A knitting machine having latch needles in combination with a latch opener adapted to pivot on an axis parallel to the length of the needles and light spring means tending to keep the latch opener in operative position against the movement of the needles.

4. A latch opening attachment for knitting machines having latch needles, the attachment including an arm having a pointed tip adapted to enter under the hooks of the needles, in combination with a mount for said opener permitting it to swing yieldingly before the movement of the needles and away from the needle circle.

5. In a knitting machine having latch needles, a latch opener for the latches of said needles having a tip pointing towards the needles as they approach the opener, in combination with a mount for said opener permitting it to swing yieldingly before the movement of the needles and away from the needle circle, and spring means tending to keep said tip under said hooks.

6. In a knitting machine having latch needles, a pivoted latch opener having a tip to enter under the hooks of said needles, said tip having a curved surface adapted to aid in freeing the tip from any obstruction when it swings away from said needles, substantially as described.

7. In a knitting machine having latch needles, a latch opener having a tip to enter under the hooks of said needles in combination with means permitting said tip to swing in an arc tangential to the movement of the needles.

8. A knitting machine having latch needles, and a latch opener having a point adapted to enter under the hooks of the needles, in combination with a mount for said opener permitting it to swing in an arc tangential to the movement of the needles, and eccentric means adjusting the extent to which the tip penetrates under the hooks of the needles.

9. A knitting machine having latch needles, and a latch opener having a point adapted to enter under the hooks of the needles, in combination with a mount for said opener permitting it to swing in an arc tangential to the movement of the needles, and eccentric means adjusting the extent to which the tip penetrates under the

hooks of the needles and the circumferential position on the needle circle of said tip, substantially as described.

10. A latch opening attachment for knitting machines having latch needles, the attachment having an arm pivoted to swing in an arc tangentially to the movement of the needles, and including a tip pointing toward the needles as they approach the opener almost up to a line drawn between the pivot point of the arm and the needle nearest thereto.

In testimony whereof I have signed my name to this specification.

ROBERT W. SCOTT.