R. W. SCOTT.

LATCH OPENER FOR KNITTING MACHINES.

APPLICATION FILED JUNE 18, 1914.

1,303,823. Patented May 13, 1919.

Fig. 1.

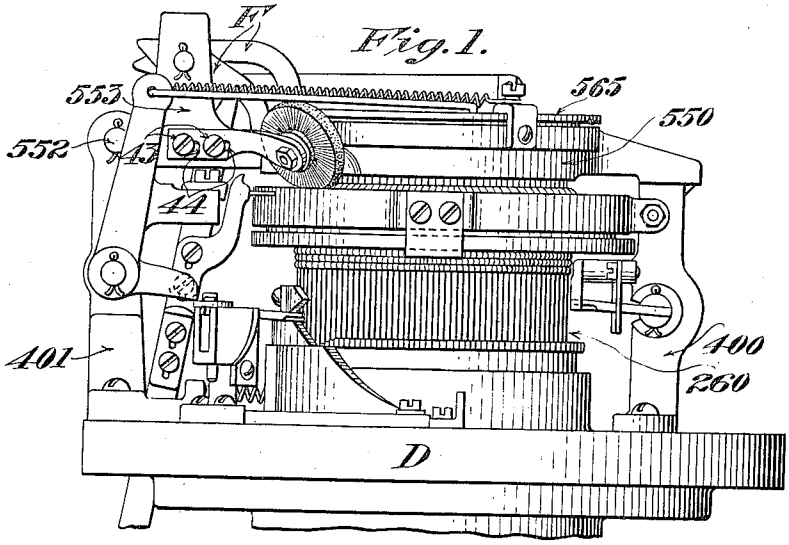
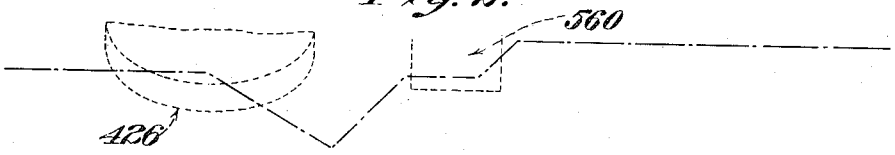


Fig. 2.



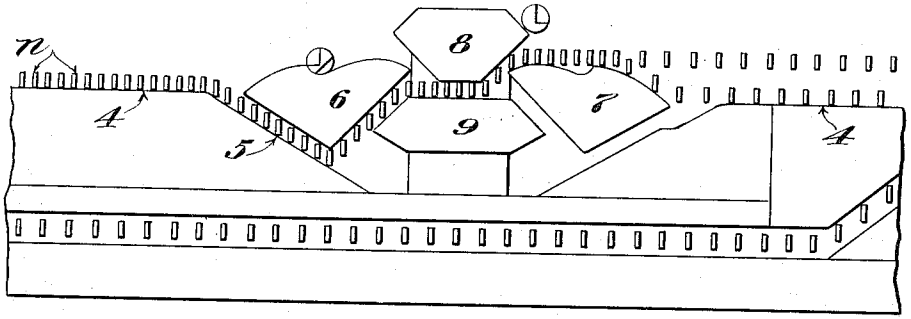


Fig. 4

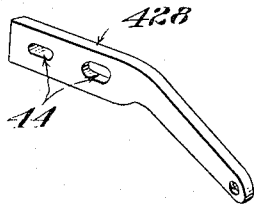


Fig. 3.

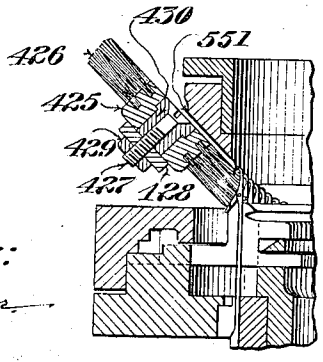
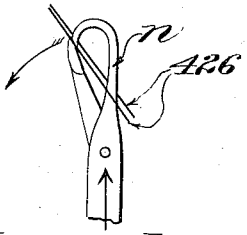


Fig. 5



Witnesses:
M. E. Crozier
Mary J. Griffin

Inventor:
Robert W. Scott
by Robert C. Ciles
his attorney

UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO SCOTT & WILLIAMS, INCORPORATED, A CORPORATION OF MASSACHUSETTS.

LATCH-OPENER FOR KNITTING-MACHINES.

1,303,823. Specification of Letters Patent. Patented May 13, 1919.

Original application filed February 3, 1913, Serial No. 746,070. Divided and this application filed June 18, 1914. Serial No. 845,845.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Latch-Openers for Knitting-Machines, of which the following is a specification.

My invention relates to latch openers for opening the latches of independently movable latch needles employed in a knitting machine, and especially to devices capable of coöperating with needles bare of a previous loop, to open their latches with certainty preparatory to knitting upon said needles.

In the accompanying drawings,

Figure 1 is a side elevation of a knitting machine provided with my new devices;

Fig. 2 is a diagram development of the cam ring of such a machine, showing that part of the needle cams coöperating with the latch opener;

Fig. 3 is a radial section through the latch ring and the upper part of the needle cylinder showing one form of my said latch opener;

Fig. 4 is a detail showing an adjustment;

Fig. 5 is an enlarged diagram showing a needle and a part of one of the brush tufts.

I have illustrated my invention in connection with a machine of the character described and claimed in my application Serial No. 746,070, filed February 3, 1913, of which this application is a division.

Above the bed-plate D upon which the knitting head, comprising in this instance a rotary needle-cylinder 260, is mounted, I support at fixed diametrically opposite positions the standards 400, 401, and a latch guard ring 550, which may be pivoted to the standard 401 on a horizontal pivot 552 for movement to an upper idle position.

Said latch guard ring may carry yarn changing yarn guides F and may be provided with a device 565 for closing the gap through which the yarn guides work at such times as certain needles are thrown upward.

The latch guard ring or an attachment thereof will provide an opening or throat 560 at the relative position indicated in Fig. 2 from which knitting yarn will lead to the needles *n*. As fully disclosed in my said application, my machine may be used in such a manner as to remove all of the yarn from the needles, and thereafter again begin knitting by automatically feeding the yarns to the bare needles. This may occur between the end of one stocking and the beginning of the next and may involve a period of idle rotation of the machine.

To insure the opening of all of the needle latches whenever a needle without a previous loop is advanced to take yarn, for instance after or during the two or three revolutions of the machine which may occur between the end of one stocking and the beginning of the next, at which time the needles of the machine are bare and move idly, I provide a rotary brush latch-opener 425 at the relative position clearly indicated by Fig. 2, where it will encounter needles rising along the advancing slope 5 forming a part of the needle-cams 6, 7, 8 and 9. As shown in Fig. 3 said latch opener 425 comprises a thin brush wheel having radial tufts 426 mounted for rotation on a screw 427 projecting at an angle which may be a relatively acute angle to the vertical axis, from a threaded bore in an arm 428 in which it is locked by a jam nut 429. Said arm 428, see Figs. 1 and 5, is adjustably held by screws 43 in slotted openings 44, upon an arm 553 of the latch guard ring 550, which is cut away at 551 to permit the brush 426 to contact with needles at a point immediately above the upper part of their rise due to the following incline 5 of the needle cams in the direction for rotary work. The cut out portion 551 of the latch ring may be a mere enlargement of the cut usually made at this point to give the opening latches room to swing in. As usual in the art, the unbroken wall of the latch ring extends around all the needles whose butts are traveling on the ledge 4, at which level the needles will have cleared their latches through their previous loops, or in a more elevated position, to prevent the open latches from closing until the needle has been lowered beyond its influence.

The location and inclination of the latch opener is such as to cause it to coöperate with a needle advancing up the incline 5 to present a few of the ends, and then the sides of other of the bristles at one end of a tuft, against the inside of the spoon of the vertically movable latch needle, thus insuring

the operation of some of the bristles to open the latch whether the bristle points have or have not penetrated between the latch and the hook, as illustrated in Fig. 5. This effect is due to the fact that the latch is as usual equipped with a spoon wider than the material of the needle hook, and which thus when closed projects at the point of the latch upon each side of the needle hook. The overhanging spoon upon the penetration of the hook proper into the inclined series of bristles, the sides of which present virtual cam inclines, is strongly influenced outwardly to open.

The proper inclination of the brush has a relation to the angle of the needle latch with respect to the needle shank, to which the improved certainty of operation and durability found to flow from the described structure is attributed. If the brush tufts are nearly parallel with the line of motion of the needle, too many of the bristles are encountered at their points by the moving needle, to be destructively buckled or bent, and without securing the cam action on the needle latch above mentioned. But when the conditions are substantially as indicated in Figs. 3 and 5, the bristles 426 presenting an incline to the direction of motion of the needle greater than the angle of the latch and still much less than a right angle, the described coaction of the bristles takes place without buckling the bristles. Owing to the rotation of brush-wheel 425 and the relative movement of the needles with their carrier, as distinguished from movement in their carrier, the needle has a virtual relative rotation about a vertical axis with respect to the direction of the bristles 426, by reason of which the latch is acted upon first from one side and then from the other side of the needle during the engagement of the needle and the brush.

The provision of a rotary wheel brush is not essential, its use being chiefly for the purposes of increasing the length of wear and providing against accumulations of lint.

The latch ring 550 and the latch-opener are free to be elevated about the stud 552 as a center, to permit the transfer of a rib-top, or access to or removal of the needle-cylinder.

What I claim is:—

1. A knitting machine having latch needles having latches inclined to their shanks when closed, and knitting cams for moving said needles in the direction of their shanks, in combination with a latch opener comprising a brush tuft at a greater inclination than said latches in the path of movement of said needles due to said cams, whereby to cause the needle to penetrate the angularly disposed tuft in the direction of the length of the needle by proper motion of the needle.

2. A knitting machine having a needle cylinder and needles having hooks and latches at an angle to the vertical when closed, said latches having a part wider than said hooks, cams for moving the needles with respect to the cylinder comprising an advancing cam, and a latch opener coöperating with said advancing cam comprising a brush tuft inclined to the vertical at a greater angle than the closed latches and in the path of the hook and latch of a needle coacting with said advancing cam and moving in the direction of its length with respect to said brush tuft.

3. A knitting machine having needles with shanks and latches resting at an angle thereto when closed, knitting cams for said needles including an advancing cam, in combination with a brush having radial tufts rotating on an axis and inclined to the path of movement of said needle at said cam at a greater angle than the angle between said shanks and latches.

4. A knitting machine having a rotary brush latch opener having peripheral tufts and free to be rotated by relative movement between the needles and its axis of rotation, and means to move the needles against the brush to open their latches, said rotary brush lying in a plane inclined to the shanks of the needles at an angle greater than that of the closed latches of the needles and less than a right angle.

5. A knitting machine having a latch opener coöperating with needles advancing in a wave at the location of said latch opener, said latch opener comprising a rotary brush free to be driven on an axis and substantially inclined with respect to the direction of the advancing motion of the needles by contact with the needles.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT W. SCOTT.

Witnesses:
M. G. CROZIER,
MARY F. GRIFFIN.