

(No Model.)

H. O. WITHERELL.
KNITTING MACHINE.

No. 547,193.

Patented Oct. 1, 1895.

Fig. 1.

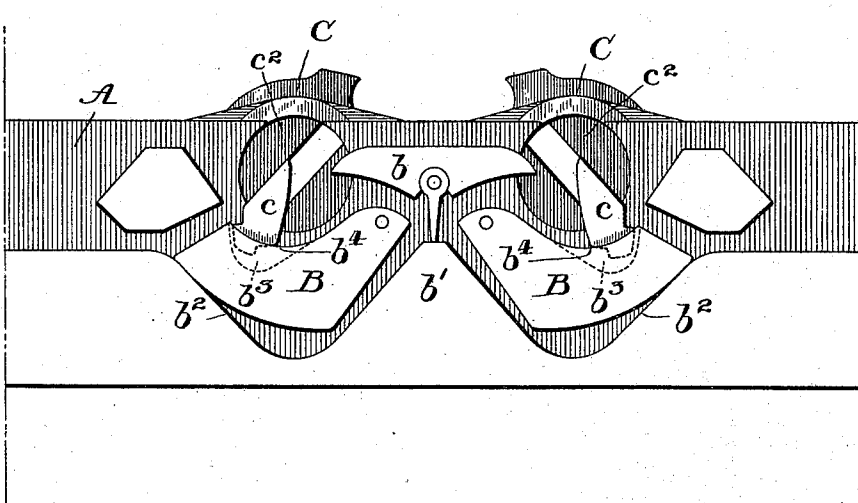


Fig. 3.

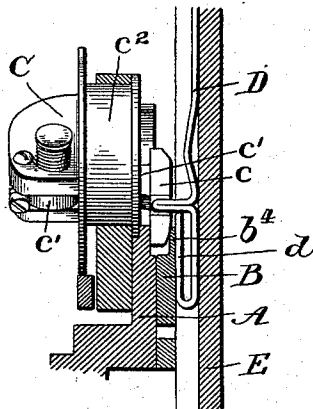


Fig. 2.

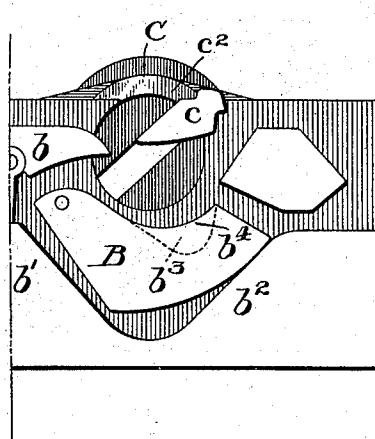
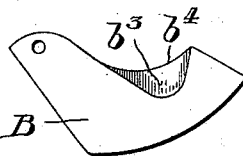


Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

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KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,193, dated October 1, 1895.

Application filed July 22, 1895. Serial No. 556,893. (No model.)

To all whom it may concern:

Be it known that I, HERMON O. WITHERELL, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to that class of knitting-machines in which the cam-carrier is provided with needle-picking devices—that is to say, means for throwing the needles into and out of action during the knitting of fashioned work, for example, as illustrated in Letters Patent of the United States No. 519,170, dated May 1, 1894.

In the patented machine referred to there are two needle-picking devices arranged above the lateral stitch-cams, respectively, which devices are brought alternately into play during the reciprocation of the cam-carrier. Each of these devices is adjustable in respect to the knitting-cams, so as to perform the function of a needle-raising cam to effect the narrowing operation, and subsequently that of a needle-depressing cam to effect the widening operation. The upper edge of each of the stitch-cams is cut away to permit the requisite action of the adjacent picker device, which cut-away portion has heretofore been objectionable by reason of the needles, when the picker is in the raised position, dropping into the depression in said cam and thereby locking the cam-cylinder, in consequence of which the heels of the needles or the ends of the cams, or both, have been broken. To overcome this objection I provide the stitch-cam with a wall or bridge, which spans the cut-away or depressed edge of the cam, as hereinafter explained. This bridge also serves to prevent the needles being carried laterally by the picker device into a position to strike the edge of the opening in the cylinder through which the device extends, as will hereinafter appear.

Referring to the drawings, Figure 1 is a development of a cam-cylinder provided with stitch-cams embodying my invention, the needle-pickers being represented as in the down

position. Fig. 2 is a similar development of a portion of the cylinder, showing one of the pickers in the raised position. Fig. 3 is a partial section through the needle and cam cylinders, showing the picker as engaging a needle. Fig. 4 is an elevation of one of the stitch-cams detached.

A designates the cam-cylinder, in which are supported the knitting-cams comprising the upper and lower central cams b and b' , respectively, the lateral stitch-cams B , and the raising end cams b^2 . The cams B are herein shown as pivoted wing-cams of the character set out in Letters Patent of the United States No. 214,989, dated May 6, 1879—that is to say, these cams are pivoted at their upper ends to the wall of the cam-cylinder, so as to swing within certain limits during their action upon the needles, and thus perform the function of switch cams or tumblers, elevating-cams, and depressing or loop cams.

C C designate needle-controlling devices, which are brought into operation alternately during the reciprocation of the cam-cylinder in knitting fashioned work. These devices, which are arranged above the free ends of the stitch-cams, each comprise in this instance a notched cam c , formed on or secured to the inner end of a swinging spring-controlled arm c' , that is pivotally connected with a rotatable head c^2 , fitted to an opening in the wall of the cylinder, whereby when the head is adjusted to set the notched nose of the cam c in proximity to the leading end of the stitch-cam, as shown in Fig. 1, such nose will raise out of action the first needle it may encounter, and whereby when the head is adjusted so as to set the nose of the cam in the path of the heels of the raised needles, as shown in Fig. 2, such nose will depress into action the first needle it may engage. In either action the cam c is swung or moved laterally into the opening in the cam-cylinder to effect the release of the engaged needle.

The upper edge of the stitch-cam is depressed or cut away, as at b^3 , to permit the adjacent nose of the picker-cam to lie below the forward upper corner of the stitch-cam, and thus permit the proper engagement of the notched portion of the picker-cam with the needles, and also to permit the requisite

swinging movement of the stitch-cam when such picker-cam is in the down position.

Heretofore when the picker-cams have been in the raised or normal position the needles, particularly after the work has been removed therefrom, have dropped into the depressed portions of the stitch-cams, thereby locking the cam-cylinder fixedly to the needle-cylinder, in consequence of which the heels of the needles or the ends of the stitch-cams, or both, have been broken. To overcome this objection I provide each of the stitch-cams with a thin face-plate or bridge *b*⁴, that spans the cut-away portion of the cam in such a manner that the respective movements of the stitch and picker cams in the cut-away part are unaffected. In the present instance this wall or bridge is an integral part of the stitch-cam; but, instead, it may be a separate piece let into the face of the cam.

By the construction just described the needles rest upon the wall or bridge of each of the wing-cams, and are thus prevented from entering into the recesses in the latter.

The needles *D*, which are reciprocated vertically in the usual needle-cylinder *E* by the rotating knitting-cams, are provided with depending tails *d*, that are constructed to bear against the face-plate or bridge of the wing-cams during the raising or the depressing of the needles by the pickers, in consequence of which the needles are maintained within the grooves in the needle-cylinder, instead of being carried bodily therefrom by the receding pickers and broken by the opposed edges of the openings colliding with the heels of the needles during the traverse of the cam-cylinder. In the present instance the tail is formed on the needle by extending the shank below

the heel of the needle and then bending the extension upwardly to afford a bearing portion of sufficient length and breadth.

I claim—

1. The combination of the cam cylinder, the lateral stitch cam therein recessed on its upper edge and provided with a face-piece or bridge which spans or incloses the recess, and a needle-picker located above said cam, substantially as described.

2. The combination of the cam cylinder, the lateral, pivoted or swinging stitch cam therein having a recess on its upper edge which is closed by a face-piece or bridge, and a needle-picker located above said cam, substantially as described.

3. The described stitch-cam having its upper edge recessed or cut away and provided with a face piece or bridge which spans or incloses the recess or cut-away portion, substantially as described.

4. The cam cylinder, needle picker and lateral stitch cam of the knitting cams, said stitch cam being recessed on its upper edge and provided with a face piece or bridge which spans or incloses the recess, in combination with the needle cylinder and its needles, said needles being provided with depending bearing pieces that take against the said face piece or bridge of the stitch cam, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

HERMON O. WITHERELL.

Witnesses:

JOHN R. NOLAN,
FRED L. VESTER.