(No Model.)

P. W. COCHRANE.

CIRCULAR RIB KNITTING MACHINE.

No. 420,772. Patented Feb. 4, 1890.

Fig. 1.

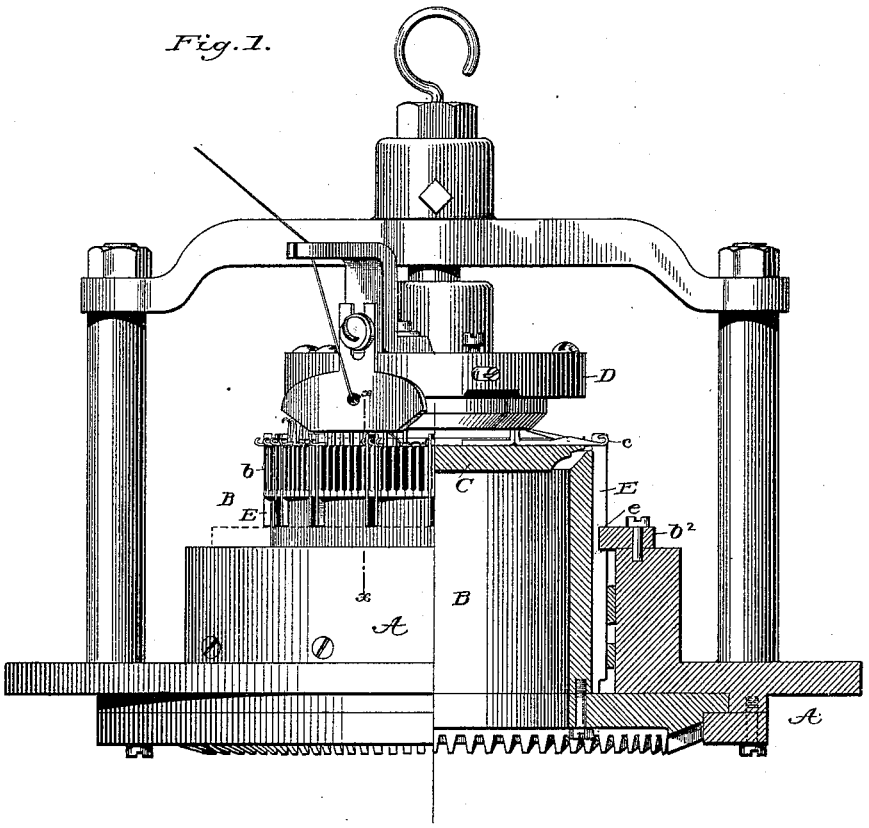


Fig. 3.

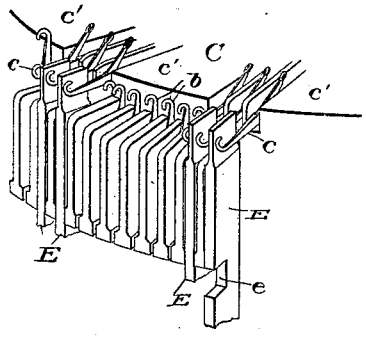
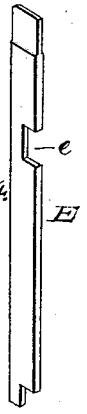


Fig. 4.



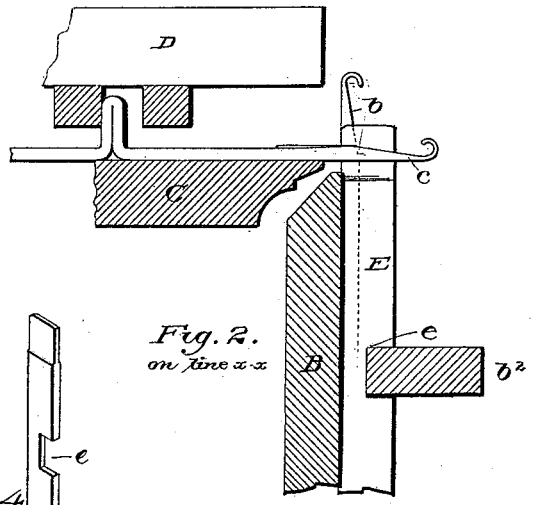


Fig. 2.
on line x-x

Witnesses:
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W. B. Kennedy

Inventor:
P. W. Cochrane
By Phil. T. Dodge
Atty

UNITED STATES PATENT OFFICE.

PHILIP WILLIAM COCHRANE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NYE & TREDICK, OF SAME PLACE.

CIRCULAR-RIB-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 420,772, dated February 4, 1890.

Application filed October 15, 1889. Serial No. 327,058. (No model.)

To all whom it may concern:

Be it known that I, PHILIP WILLIAM COCHRANE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Circular-Rib-Knitting Machines, of which the following is a specification.

My invention relates to those machines in which vertical needles in a cylinder are employed in connection with horizontal needles in a dial-plate, and it relates particularly to machines of this type constructed or adjusted for the production of ribbed fabrics.

In knitting fabrics with wide ribs it is the custom to divide the dial-needles into groups and operate the same in connection with intermediate groups of needles in the cylinder. As machines are commonly operated for this purpose there is nothing to hold the loops or stitches of the dial-needles inward as the needles are thrust outward. It therefore follows that the loops or stitches of these dial-needles are frequently carried outward with the needles beyond the desired point, so that the latches occasionally fail to pass completely through the loop. The result is inequalities in the length of the stitches and the cutting of the yarn by the open latches passing through the same on the inward stroke of the needles. It is also found that the threads are frequently cut or mutilated by the dial-needles dragging them across the corners or edges of the cylinder-ribs at points where the cylinder-needles are omitted.

The object of my invention is to overcome these difficulties, secure a proper and positive action of every needle, and produce smoother and more uniform ribs.

To this end the invention consists in providing the cylinder with pressers or ribs projecting at their upper ends between and above the paths of the dial-needles, so that as the dial-needles are thrust outward between these pressers the latter act to hold their loops or stitches inward.

I commonly construct the needle-cylinders with the full complement of needle-grooves, as usual, and make my pressers in the form of bars, which are adapted to fit into the cylinder-grooves, from which the needles are omitted—that is to say, into the grooves opposite the dial-needles. The bars or pressers thus inserted rest movably in the cylinder and revolve therewith, their upper ends projecting above the cylinder adjacent to the outer edge of the dial so as to stand between the projected dial-needles. It is to be understood, however, that I believe myself to be the first to employ, in a ribbing-machine, pressers projecting upward between the dial-needles to prevent the loops from being carried outward by the latter, and that I intend by my claim to cover such pressers in any form the mechanical equivalent of that herein shown.

As the knitting-machine may be in all other respects of ordinary construction, I have given in detail in the drawings only those parts which are necessary to a proper understanding of my invention.

In the accompanying drawings, Figure 1 represents an elevation of an ordinary knitting-machine provided with my improvement, one side being shown in vertical section on a plane passing through the center. Fig. 2 is a vertical cross-section through one side of the cylinder and dial in the line *x x*, Fig. 1, with my presser in position. Fig. 3 is a perspective view showing one edge of the cylinder and dial with the pressers in place. Fig. 4 is a perspective view of one of the presser-plates.

Referring to the drawings, A represents the bed or frame of the machine, B the rotary needle-cylinder provided, as usual, with a series of vertical sliding needles *b*, actuated by cams on the inside of the frame.

C is the rotary dial-plate suspended from a cross-bar, forming part of the main frame, and containing a series of radial needles *c*, which are actuated by the usual cams on the under face of a stationary overlying plate D.

As shown in Fig. 3, the dial-needles are arranged in groups with wide intervening spaces between them. The dial-plate is commonly provided with such grooves only as are required to receive the needles, the intervening surfaces *c'* being left unbroken. The cylinder-needles are also divided into groups, which fill the spaces between the groups of dial-needles. In other words, the groups of dial and cylinder needles are alternated.

The arrangement so far described is the same as in ribbing-machines now in general use, the needles of each set knitting independently of those of the other set, and the result being a tubular fabric, with inside ribs formed by the dial-needles and outside ribs formed by the cylinder-needles.

In applying my improvement I commonly provide the cylinder with a full complement of grooves for the needles, and, omitting the needles from the grooves which are opposite the dial-needles, I insert into each of said said grooves a presser-blade such as shown at E, Fig. 4. This blade is adapted to fit snugly into the needle-groove of the cylinder and to extend upward somewhat above the upper end of the cylinder and above the level of the dial-needles. I slightly reduce the upper ends of the presser-blades in thickness and round the corners that they may not cut the threads. I also provide each blade near its lower end with a notch *e*, adapted to receive the edge of the usual ring b^2, fixed to the top of the bed-plate, whereby the pressers are held to their places in the grooves and prevented from moving vertically.

The machine is provided, as shown in Fig. 1, with the usual thread-guiding arm, by which the thread is laid to the cylinder and dial needles. The thread is laid to the dial-needles between the upper ends of the pressers or sinkers and the outer edge of the dial, the space for the introduction of the thread being clearly shown in Fig. 3. As there are no sinkers between the cylinder-needles, their upper ends are exposed that the thread may be laid freely to them. When the dial-needles are thrust outward, they pass, as shown in Figs. 2 and 3, between the upper ends of the pressers, which retain the stitches in their positions close to the edge of the dial. The result, as before stated, is an absence of the objectionable cutting action, the production of a smooth closely-knitted fabric of uniform texture, and a fullness and roundness of the ribs not attainable in ordinary machines. The pressers are also advantageous, in that they prevent those cylinder-needles which stand next to the dial-needles from being carried outward and impaired in their action by the outward thrusts of the dial-needles through the fabric.

Having thus described my invention, what I claim is—

1. In a knitting-machine having a cylinder and dial provided with alternated groups of needles for producing a ribbed fabric, pressers carried by the cylinder and projecting upward between the projected dial-needles, said elements combined substantially as described.

2. In a knitting-machine, the combination of the dial and its needles arranged in groups, the cylinder provided with a full complement of needle-grooves, and with needles in those grooves only which are between the dial-needles and presser-blades, substantially as described, inserted in the remaining needle-grooves of the cylinder and projecting above the cylinder.

3. In a knitting-machine, the combination of the dial and its needles arranged in groups, the cylinder and its needles arranged in groups intermediate of the groups of dial-needles, the presser-blades E, inserted in the cylinder adjacent to the groups of dial-needles, and the retaining-ring by which said pressers are held in position.

4. A presser-blade, substantially as described, adapted to fit within and project above the needle-grooves of a knitting-machine cylinder.

5. The notched presser-blade E, adapted, as described, for introduction into the grooves of a needle-cylinder.

In testimony whereof I hereunto set my hand this 5th day of October, 1889, in the presence of two attesting witnesses.

PHILIP WILLIAM COCHRANE.

Witnesses:

CARROLL R. WILLIAMS,

JOHN C. BREWIN.