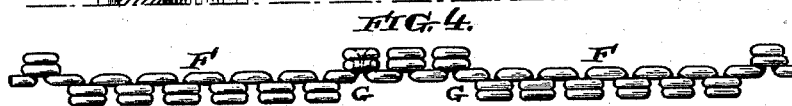
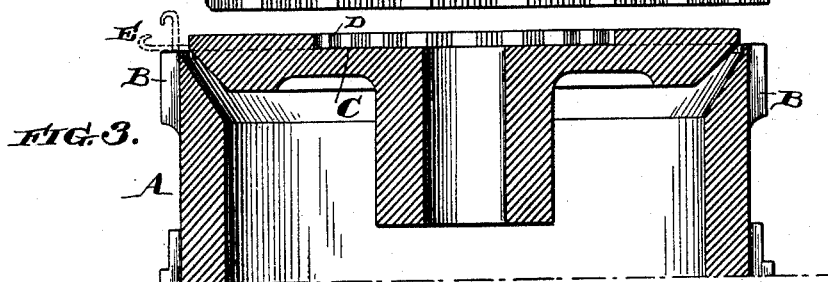
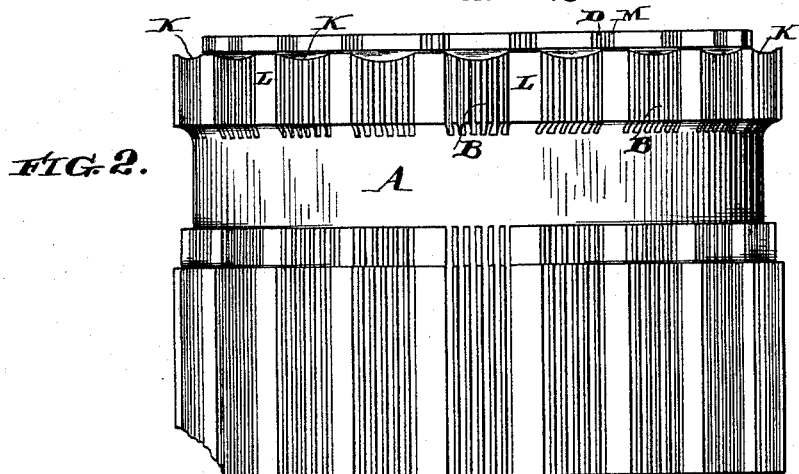
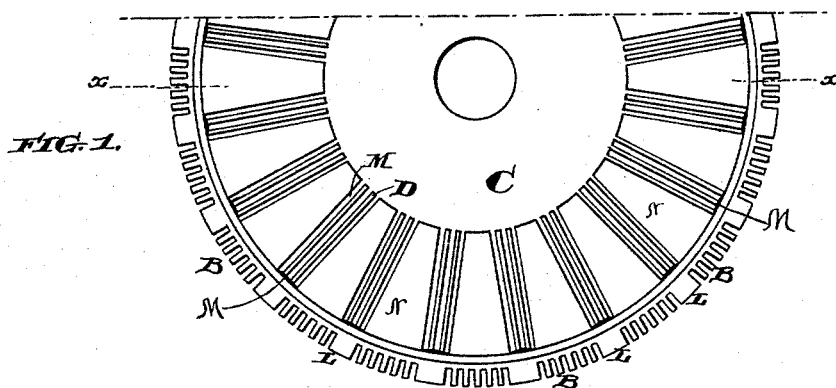


(No Model.)

A. McMICHAEL.
CYLINDER FOR KNITTING MACHINES.

No. 456,496.

Patented July 21, 1891.



Witnesses:

Henry D. Dwyer
S. T. Myerkes.

Inventor:

Alfred McMichael
By *W. H. Allen*

UNITED STATES PATENT OFFICE.

ABNER McMICHAEL, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR TO
McMICHAEL & WILDMAN, OF SAME PLACE.

CYLINDER FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 456,496, dated July 21, 1891.

Application filed November 14, 1890. Serial No. 371,401. (No model.)

To all whom it may concern:

Be it known that I, ABNER McMICHAEL, of Norristown, county of Montgomery, and State of Pennsylvania, have invented an Improvement in Cylinders for Knitting-Machines, of which the following is a specification.

My invention has reference to knitting-machines; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

This improvement relates to that class of knitting-machines especially adapted for knitting rib-work, the details of such machines being shown in the application of Frank B. Wildman and myself, filed February 10, 1890, Serial No. 339,836.

My improvement forming the basis of this application relates to the construction of the needle-cylinder adapted for use with the ordinary cams, and is such that the pull of the needles upon the loops is varied to produce uniform loops in the resulting fabric.

Heretofore in knitting rib-work of various patterns, including what is known as the "broad rib," upon machines of this class the outer vertical rows of loops of the rib were invariably drawn more tightly than those portions of the rib constituting its middle. This was objectionable, and was defective, in that it prevented the proper elasticity and also impaired the beauty of the design. My present improvement is designed to overcome this defect, and in carrying out my invention I notch or curve the upper edge of the needle-cylinder above the vertical grooves in which the needles play, so that the middle needles of those forming the rib may draw the loops farther down with reference to a horizontal plane than the needles adjacent to the edge of the rib. The same construction may be employed in connection with the horizontal dial in which the radial needles are arranged, and which needles are employed to form that portion of the tubular knitted fabric arranged between the ribs.

In the drawings, Figure 1 is a plan of the dial and needle-cylinder with a portion cut away. Fig. 2 is an elevation of same. Fig. 3 is a sectional elevation on line *xx* of Fig. 1. Fig. 4 is a view illustrating the nature of the

fabric knitted upon my improved machine, and Fig. 5 is a view illustrating the nature of the fabric knitted upon the old construction of machine.

A is the needle-cylinder, and is provided about its circumference with the vertical grooves B for the needles and the interposed smooth parts L, which parts are arranged between the groups of needle-slots B and in line with the horizontal needle-grooves D of the dial C. The smooth parts N of the dial likewise come in line with the slotted or grooved portions B of the vertical needle-cylinder. The upper edge of the vertical cylinder A, above the vertical grooves B, is curved, as at K, so that the middle slots or grooves are shorter than those adjacent to the parts L. This same principle of construction may be carried out with the dial by forming the curved parts M on the ends of the portions constituting the grooves D.

E represents the needles, which operate at right angles to each other in the well-known manner, the needles of the needle-cylinder A operating to form the face of the rib F and the needles of the dial C operating to form the depressed portion G of the fabric interposed between the ribs.

Referring to Fig. 4, it will be seen that all of the loops F and G are uniform and make a perfect fabric, such being the result of the improvements in the needle-cylinder and dial embodying my invention. In Fig. 5 this uniformity is lacking, showing that the loops of the rib adjacent to the interposed part G of the fabric are drawn more tightly than the loops I, forming the middle portion of the rib. Likewise the loops G are drawn more tightly than the intermediate loop J. It is evident that, if desired, the curved or depressed portions may be arranged alone upon the needle-cylinder A and not upon the dial C, or vice versa. In cases where the number of grooves B is great the necessity of this depressed or curved portion will be greater. As a rule, the rib portions produced by the needles of the grooves B are far greater in width than the intermediate portions of the fabric produced by the needles of the grooves D in the dial, and consequently in the majority of cases there would be no necessity for forming the

curved or depressed portions in the edge of the dial.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A circular needle-support for a knitting-machine having a series of grooves for the needles, the edge of said needle-support being formed with depressed or curved portions
10 at the termination or ends of the grooves.

2. In a knitting-machine, a cylinder A, having a series of vertical grooves B for the needles, the upper edge of which is formed with depressed curved portions K at the termination or ends of the grooves.
15

3. In a knitting-machine, a cylinder A, having series of vertical grooves B for the needles, the upper edge of which is formed with depressed or curved portions K, said cylinder, having solid intermediate portions L interposed between the several series of vertical
20 grooves B.

4. In a knitting-machine, a cylinder A, having series of vertical grooves B for the needles, the upper edge of which is formed with depressed or curved portions K, in combination with a dial having series of radial grooves for needles, the cylinder A and the dial being arranged with reference to each other so as to bring the grooves of the dial between the depressed curved portions K of the cylinder.
25 30

5. In a knitting-machine, a cylinder A, having series of vertical grooves B for the needles, the upper edge of which is formed with depressed curved portions K, in combination with a dial having series of radial grooves for needles and having its edges adjacent to said grooves provided with curved depressions M.
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In testimony of which invention I have hereunto set my hand.

ABNER McMICHAEL.

Witnesses:

EUGENE D. EGBERT,
GEO. W. GROFF.