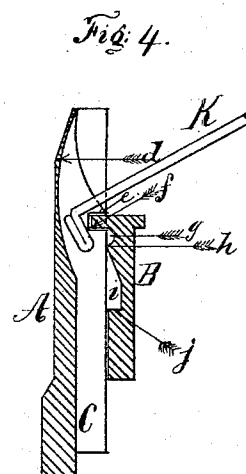
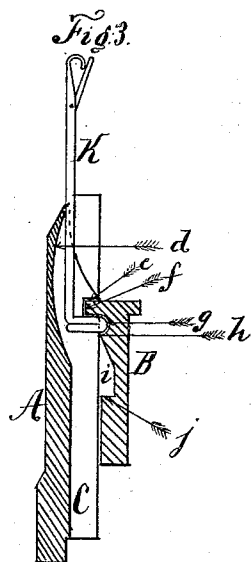
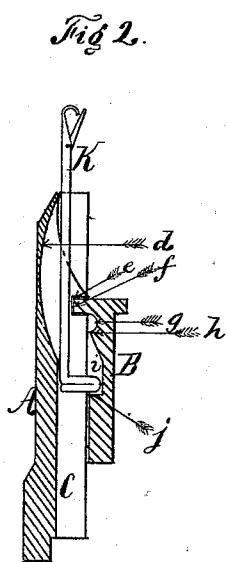
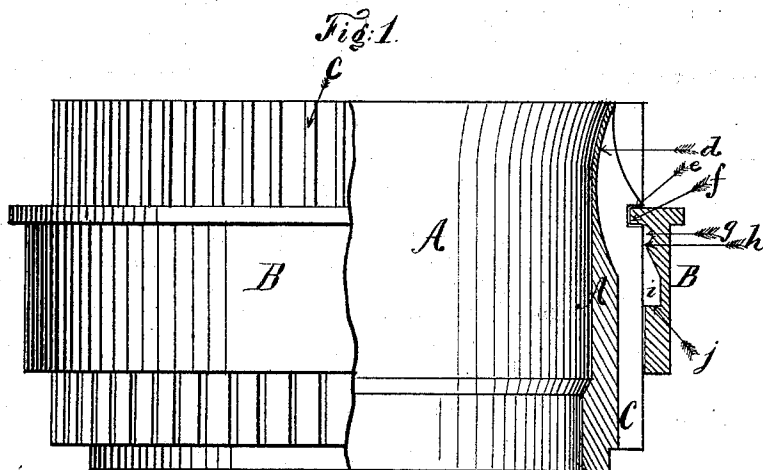


R. D. LEECH.
Cylinders for Knitting-Machines.

No. 150,965.

Patented May 19, 1874.



Witnesses.
Franklin Barritt
Richard Gerner.

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UNITED STATES PATENT OFFICE.

ROBERT D. LEECH, OF NEW YORK, N. Y.

IMPROVEMENT IN CYLINDERS FOR KNITTING-MACHINES.

Specification forming part of Letters Patent No. **150,965**, dated May 19, 1874; application filed April 28, 1874.

To all whom it may concern:

Be it known that I, ROBERT D. LEECH, of New York city, county and State of New York, have invented certain Improvements in Knitting-Machines, of which the following is a specification:

The object of my invention is to provide an improved means for raising out of action and taking out needles at any point of a cam-cylinder, except at that part occupied by the cams.

In the knitting of heels, toes, &c., it is necessary to raise some of the needles above the cams, so that the raised needles shall not knit, but shall still retain their stitches until again lowered into action.

In automatic knitting-machines now in use, the needles, when raised out of action, are held up, either by means of the friction of the yarn on the shank of the needle, or by means of a nick or projection in the shank of the needle. Both methods I consider objectionable. When the needle is held up by friction of the yarn only, it is liable to drop, especially in loose knitting; and when the nick or projection is used, the needle is weakened, and the fabric is liable to be torn.

In order to overcome these difficulties, it is necessary to hold the needles up more positively, and yet admit of their being readily lowered at any required point.

In order to take the needles out of their grooves, there are different methods in use, all of which I consider objectionable. One is by means of a ring, which encircles the needles and requires to be unclasp; another is where the flange of the cam-cylinder merely touches the needle-cylinder, leaving the needles unsteady in their grooves.

By my improved means, the needle is held sufficiently firm when in action, and yet can be readily raised or taken out at any point.

My invention consists in making the needle-groove deeper, in the form of a curve, just opposite the annular groove, ordinarily occupied

by a ring-clasp, or its equivalent, and forming on the inside of the cam-cylinder a projection, and immediately above which is a slight annular groove formed between the projection and the cam-cylinder flange.

By this arrangement, when the needle is raised, its butt occupies the annular groove in the cam-cylinder, and is held positively elevated, and when the butt of the needle is below the projection, it is held firmly in position by the aid of the inner flange of the cam-cylinder, and yet loosely enough to be worked readily up and down by the cam.

In taking out the needle, it is raised until the butt is arrested by the flange of the cam-cylinder, when the needle is turned outward, the curved needle-groove allowing the butt readily to pass the inner flange of the cam-cylinder.

In order to describe more fully my invention, I refer to the accompanying drawing, forming a part of this specification.

A is the needle-cylinder; B, the revolving cam-cylinder; and C C are the needle-grooves in the cylinder A. *d* is the curved groove on the back of the grooves C, and opposite the annular groove *e*. *f* is the inside flange of the cam-cylinder, fitting into the groove *e*. *g* is the slight annular groove on the inside of the cam-cylinder. *h* is the projection, forming the lower wall of the annular groove *g*. *i* is the annular space above the needle-shelf *j*. K is a needle.

Having thus described my invention, I claim—

The needle-cylinder provided with the curved groove *d* and the annular groove *e*, in combination with the cam-cylinder B, provided with the flange *f*, the annular space *i*, the projection *h*, and the annular groove *g*, substantially as and for the purpose set forth.

ROBT. D. LEECH.

Witnesses:

ANTON C. CRONDAL,
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