

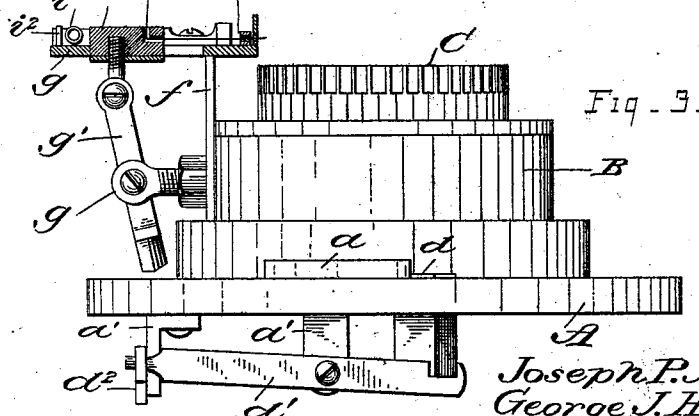
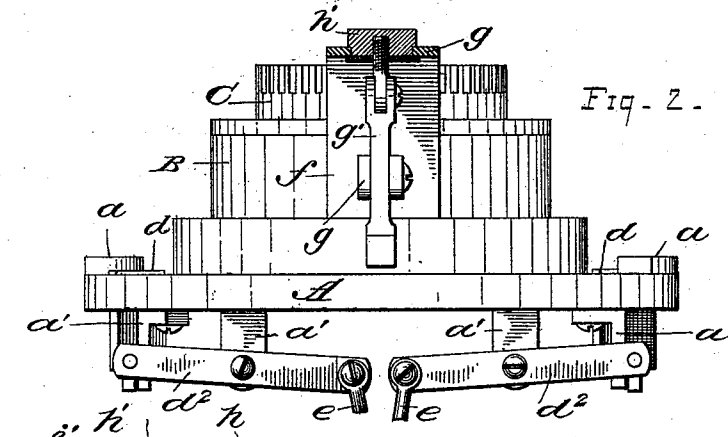
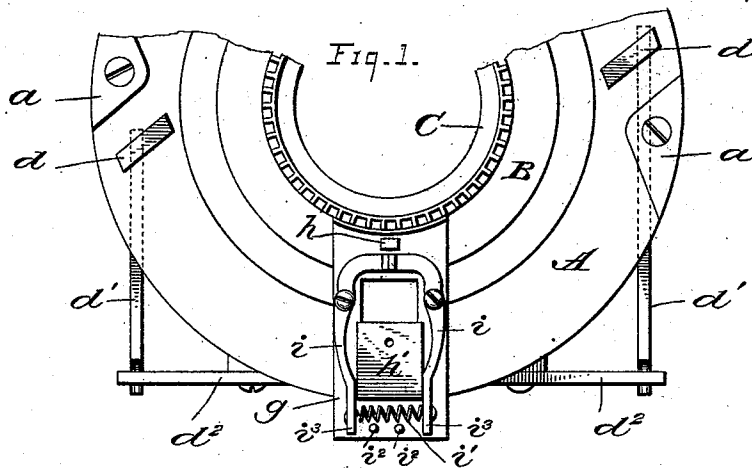
(No Model.)

2 Sheets—Sheet 1.

J. P. MORIN & G. J. H. JACQUES.
CIRCULAR KNITTING MACHINE.

No. 531,553.

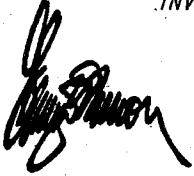
Patented Dec. 25, 1894.



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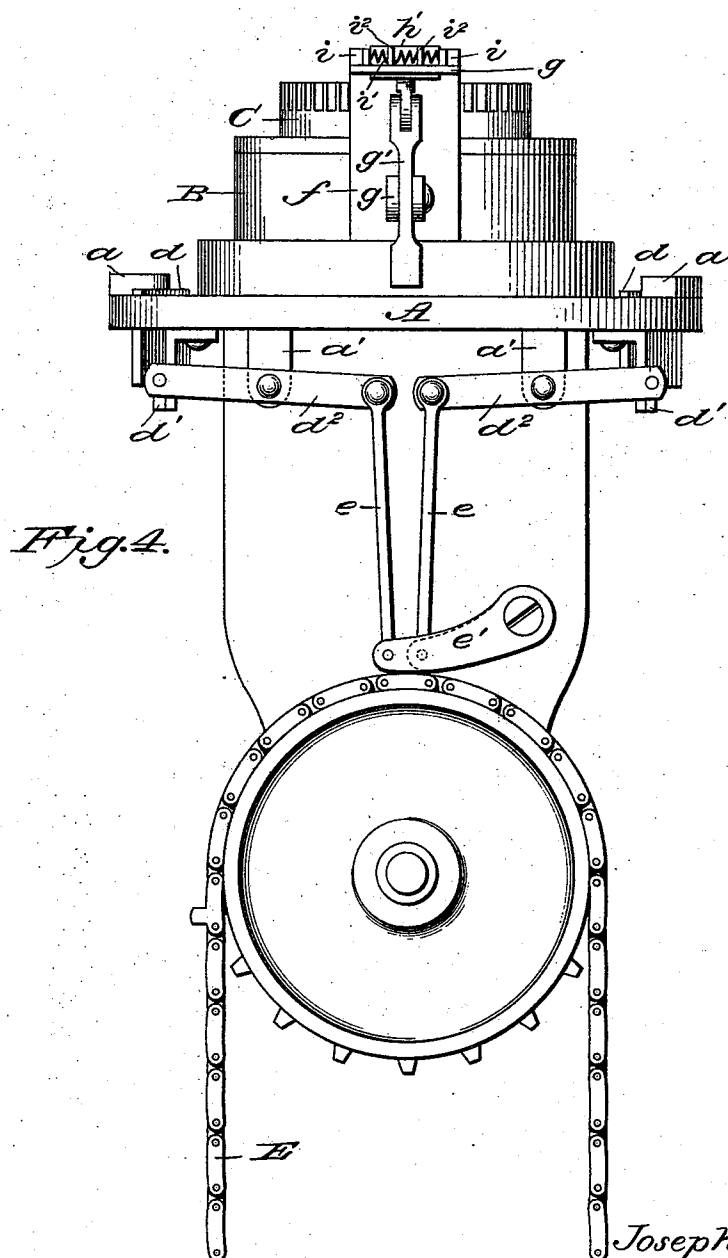
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UNITED STATES PATENT OFFICE.

JOSEPH P. MORIN AND GEORGE J. H. JACQUES, OF LACONIA, NEW HAMPSHIRE.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,553, dated December 25, 1894.

Application filed December 21, 1893. Serial No. 494,339. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH P. MORIN and GEORGE J. H. JACQUES, citizens of the United States of America, residing at Laconia, in the county of Belknap and State of New Hampshire, have invented certain new and useful Improvements in Circular-Knitting Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide improved means for introducing a reinforcing thread into the web of knitted goods at those parts where the greatest wear is likely to come; for instance, in hosiery, at the knee and just above the heel.

The invention consists in the construction and combination of the parts, as will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view showing the improvements applied. Figs. 2 and 3 are side elevations, partly in section, and Fig. 4 is a side elevation showing the manner of operating the movable cams.

A designates the bed-plate of a circular-knitting machine which is fixed to a suitable support or frame, and upon this bed-plate is mounted the needle cylinder C and revolving cam or ring B, which parts are of the usual construction.

Upon the bed-plate A and at the outer edge thereof are rigidly secured blocks or cams *a*, the inner faces of which are inclined as shown, and adjacent to these blocks or cams the bed-plate is apertured for the passage of vertically movable blocks or cams *d* which are so positioned with respect to the stationary cams that they will project beyond the inner ends of the same when moved above the surface of the bed-plate. The cams *d* are moved above and below the surface of the bed-plate by means of levers *d'* which are pivoted to hangers *a'* and engage said cams at one end while the other end of each lever is raised and low-

ered from a pattern-chain E by means of pivoted levers *d''*, connecting rods *e* and levers *e'*, the levers *e'* being pivoted to the frame of the machine and operated upon by a pattern-link 55 of the chain E.

The cam ring B which revolves around the stationary needle-cylinder C carries the yarn guide which is supported upon the upper end of a plate or bracket *f*. The yarn guide consists of a horizontal plate *g* to the inner end of which is fixed an eye *h* through which both the main and reinforcing yarns are fed from bobbins or cops to the needles, the said plate being apertured to receive a sliding block *h'* 65 having an eye through which the reinforcing thread or yarn passes to the eye *h* and a clamp *i* the jaws of which shut upon the reinforcing thread or yarn and are opened by means of the sliding block *h'* as hereinafter described. 70 The jaws of the clamp *i* are pivoted upon the plate *g* on either side of the movable block *h'* so that the clamping ends thereof will engage the reinforcing thread or yarn just before it enters the eye *h*, and these clamping ends of the jaws are opened by means of a helical spring *i'* interposed between the opposite ends as shown, the opening of the jaws being limited by the stops *i''*. The jaws are of such peculiar construction that when the sliding 80 block *h'* is moved between the straight portions *i'''* thereof the ends will clamp the reinforcing thread or yarn between them so that said thread or yarn will be broken at the needles, while the movement of the block 85 away from the straight portions and toward the eye *h* will permit the clamp to release the reinforcing thread or yarn by the action of the spring and at the same time feed slack thread or yarn to the web. This act of feeding the yarn or thread to the web and breaking the same permits the device to be used to reinforce only a part of the web. 90

The block *h'* is moved in and out of engagement with the clamp *i* by means of a pivoted lever *g'* which is supported by a lug *g* projecting from the plate *f* and is attached to said block and engaged by the cams *a* and *d*. 95

In operation, when the knitting has reached that point at which it is desired to introduce or insert the reinforcing threads the pattern-link of the chain E operates the levers 100

connected to one of the movable cams d and elevates said cam above the surface of the bed-plate, so that when the thread guide which is carried by the revolving cam ring B reaches the same the lever g' will be thrown to move the block h' out of engagement with the clamp and toward the eye h which movement will release the reinforcing thread or yarn and feed the same along with the other yarn to the web, and when the thread guide moves to the other side of the bed-plate where the stationary cam a is located said cam will throw the lever and cause the block h' to operate the clamp to close upon the reinforcing thread or yarn, the movement of the shell and guide breaking the thread or yarn at the needles. When the guide, by the revolution of the shell, again comes in contact with the elevated cam d the reinforcing thread or yarn is again released and drawn into the web by the constant friction of the yarn of the web pulling the free end of the reinforcing thread or yarn, and by the constant suction created by the rotary motion of the revolving cam ring. As the reinforcing thread or yarn is fed to the web with the yarn at each half revolution of the cam ring B the said reinforcing thread or yarn will be introduced or inserted in only one side of the circular web, and when it is desired to insert the thread on the other side the pattern chain depresses the elevated cam and operates the other levers to elevate the other cam. When both cams are depressed the reinforcing thread is held and the knitting proceeds with but the one yarn.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a thread-feeding mechanism for knitting-machines, the combination, of a reciprocating block having an eye through which passes a reinforcing thread, a stationary eye for the main thread on a line with the eye of the reciprocating block and a clamp consisting of a pair of jaws pivoted so that the clamping ends will close upon the reinforcing thread, the opposite ends of the jaws being drawn together by a spring and separated by the reciprocating block, of a lever which engages with the reciprocating block and means for actuating said lever, the means being carried by the bed-plate, for the purpose set forth.

2. In a thread-feeding machine for knitting-machines, a reciprocating block having an eye for the passage of the reinforcing thread, a fixed eye through which pass both the main and reinforcing threads, and a clamp which is adapted to engage with the reinforcing thread on the outward movement of the reciprocating block and hold the same so that it will be broken at the needles, together with a spring for opening the jaws of the clamp, a lever carried by the cam ring for reciprocating the block through which the reinforcing thread passes, stationary and movable blocks which

project above the surface of the bed-plate, and a pattern-chain having projections which actuate the movable cams through the interposition of levers pivoted to the bed-plate, substantially as shown, and for the purpose set forth.

3. In a knitting machine, the combination, of a thread guide having an eye through which is threaded the main and reinforcing threads, a clamp having jaws between which the reinforcing thread passes, and a reciprocating block having an eye for the reinforcing thread said block moving between the long ends of the pivoted jaws to close the clamping ends of said jaws upon the reinforcing thread, substantially as shown and for the purpose set forth.

4. In a knitting machine a thread guide comprising a stationary eye, a reciprocating block with an eye through which the reinforcing thread passes, and a clamp having separable jaws which are spring-actuated in one direction and operated by the movable block in the other direction, substantially as shown and for the purpose set forth.

5. In a knitting machine, a ring provided with cams a thread guide comprising a stationary eye, a reciprocating block with an eye through which the reinforcing thread passes, a clamp having separable jaws which are spring-actuated in one direction and actuated in the other direction by the movable block, and a lever carried by the cam-ring, and connected to the reciprocating block and operated upon by cams, substantially as shown and for the purpose set forth.

6. In a knitting machine, a bed-plate having on one or more sides a stationary block or cam a and a movable block or cam d , of a thread guide consisting of a reciprocating block and clamp having jaws which are positioned between the fixed thread-guide and the reciprocating block, and a pivoted lever for reciprocating the block, one end of said lever being adapted to engage the blocks or cams, substantially as shown and for the purpose set forth.

7. In a knitting-machine, the combination, of a bed-plate supporting the needle-cylinder and cam ring, fixed cams secured on the bed-plate and cams movable above and below the surface of the latter, means for operating the movable cams from a pattern-chain and a lever pivoted to the cam ring and adapted to be operated upon by the cams, together with a thread-guide comprising a reciprocating block through which the reinforcing thread passes and clamping jaws which are operated by the reciprocating block to close them upon the reinforcing thread, the reciprocating block being connected to the lever carried by the cam ring, substantially as shown and for the purpose set forth.

8. In a feeding-mechanism for knitting-machines, the combination, of a bed-plate having a stationary cam or cams a and a movable cam or cams d , means for raising the movable

cam or cams above the surface of the bed-plate, a cam-ring and a thread-guide carried by said cam-ring, the thread-guide comprising a stationary eye, a clamp and a reciprocating block for operating the clamp, the reciprocating block having a thread-eye, together with a lever pivoted to the cam ring and engaging at one end the reciprocating block and at the other the stationary and movable cams, substantially as shown and for the purpose set forth.

9. In a knitting machine, a thread-guide having a reciprocating block with an eye, clamping jaws and a lever connected to the reciprocating block, in combination with stationary cams located on the bed-plate and cams which are movable above and below the surface of the bed-plate, together with a lever which operates said cams, rods *ee* connected to the movable cams, levers connected to the rods *ee* and a chain having pattern-links which actuate the levers, substantially as shown and described.

10. In a knitting machine, the combination,

of a bed-plate having stationary blocks or cams *a*, with inclined sides, and vertically movable blocks or cams *d*, means for elevating the movable blocks or cams, a thread-guide carried by the cam-ring B of the machine, the thread-guide comprising a plate *g*, clamping jaws *ii* pivoted thereupon, helical spring *j* for connecting the outer ends of the levers *ii* the tendency of which is to open the jaws, a reciprocating block with an eye located between the levers, a pivoted lever connected to the reciprocating block and operated upon by the blocks or cams *a* and *d*, said reciprocating block engaging the clamping levers to clamp them upon the reinforcing thread, substantially as shown and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH P. MORIN.

GEORGE J. H. JACQUES.

Witnesses:

SAMUEL H. MARTIN,

FRED E. HELSON.