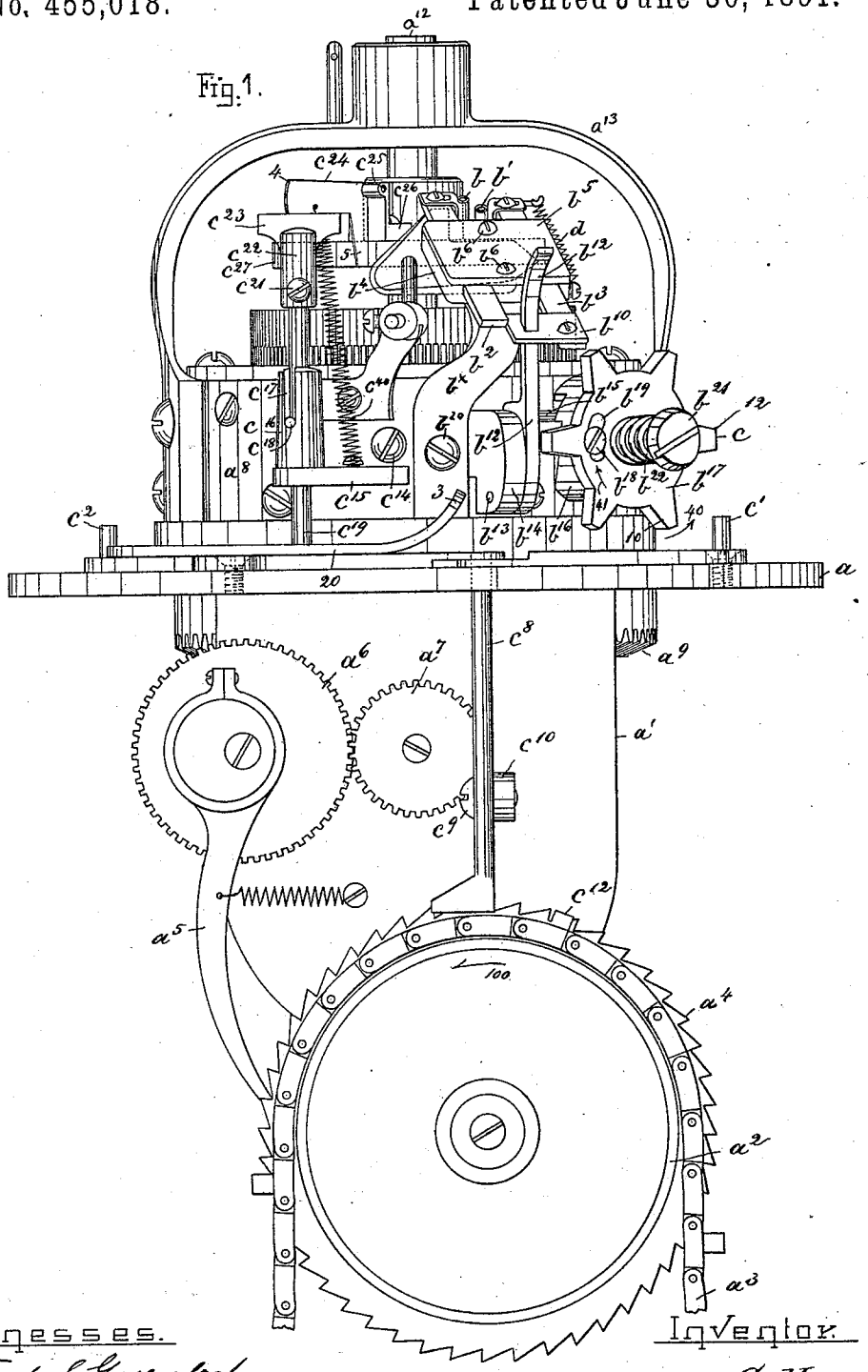
(No Model.) 2 Sheets—Sheet 1.

L. C. HUSE.

FEEDING MECHANISM FOR CIRCULAR KNITTING MACHINES.

No. 455,018. Patented June 30, 1891.

Fig. 1.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

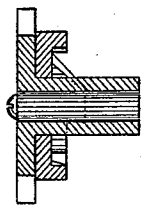


Fig. 3.

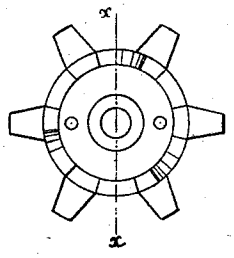


Fig. 5.

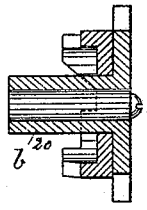
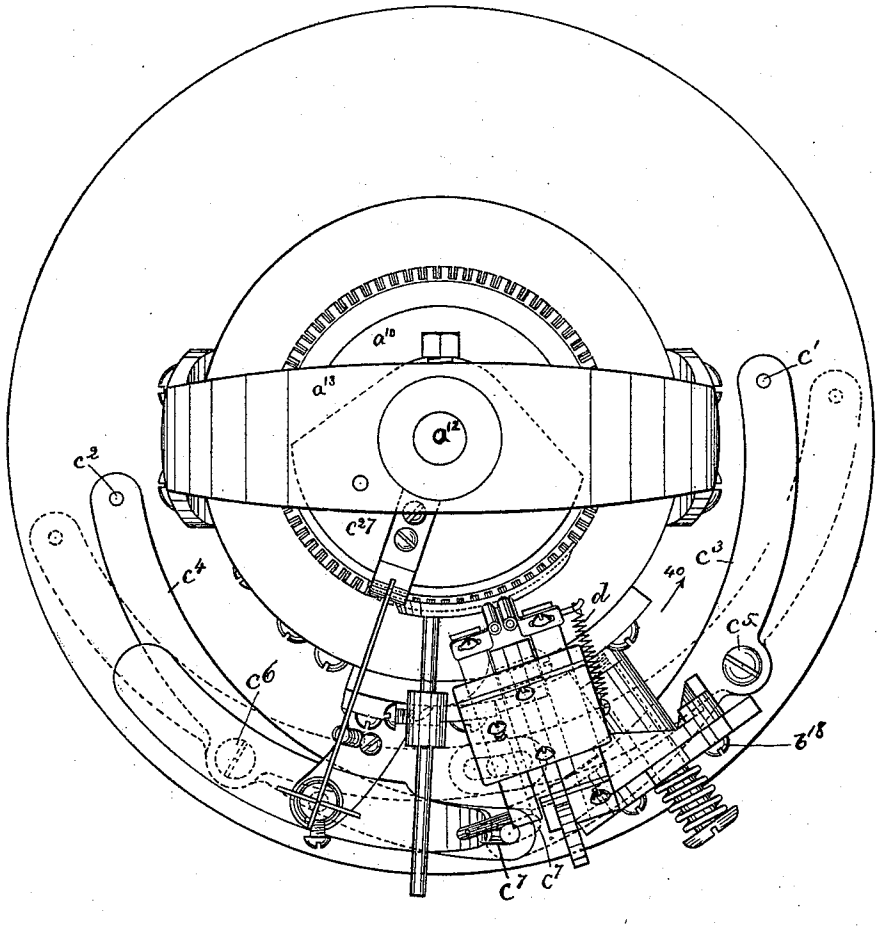


Fig. 2



Witnesses

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UNITED STATES PATENT OFFICE.

LEON C. HUSE, OF LACONIA, NEW HAMPSHIRE, ASSIGNOR TO WARREN D. HUSE, OF SAME PLACE.

FEEDING MECHANISM FOR CIRCULAR-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 455,018, dated June 30, 1891.

Application filed July 1, 1890. Serial No. 357,340. (No model.)

To all whom it may concern:

Be it known that I, LEON C. HUSE, of Laconia, county of Belknap, State of New Hampshire, have invented an Improvement in Feeding Mechanism for Circular-Knitting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to circular-knitting machines, and has for its object to provide mechanism, as will be described, by which a second or independent thread may be knitted to form a double thickness of re-enforce for the garment at those parts or places most subjected to wear—as, for instance, at the knees of stockings.

My invention in a circular-knitting machine therefore consists in the combination, with the needle-cylinder to contain needles, the cam-ring, a stationary thread-guide, a movable thread-guide and its carrier, of a disk pivoted to the cam-ring and provided with one or more cams, an actuating device for the movable carrier operated by the said cams to effect the movement of the movable thread-guide carrier, levers c^3 c^4, provided with posts to rotate the disk, a pattern-chain, and a pivoted rod connected to the said levers and acted upon by the pattern-chain to move the said levers, substantially as will be described.

Other features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of a sufficient portion of a knitting-machine embodying my invention to enable it to be understood. Fig. 2 is a top view or plan of the machine shown in Fig. 1; Fig. 3, a detail in elevation of the operating-cam; Fig. 4, a sectional detail of the cam shown in Fig. 3 on line x x, looking toward the right; and Fig. 5, a section of the cam shown in Fig. 3 on line x x, looking toward the left.

The bed-plate a, having the depending bracket a', the pattern-ring a^2, pivoted thereto and provided with the pattern-chain a^3, the rachet-wheel a^4 to move said pattern ring and chain, the pawl a^5 and gears a^6 a^7, rotated from the cam-ring a^8 to operate the said pawl, the cam cylinder or ring a^8, carrying the cams for operating the cylinder-needles, (not herein shown,) the bevel-gear a^9, secured to the under side of the cam-ring, the dial-plate a^{10}, the spindle a^{12}, upon which the said plate is mounted, and the yoke a^{13}, secured to the cam-ring a^8, are and may be of usual construction, such as commonly employed on circular-knitting machines.

In accordance with my invention the machine is provided with two thread-guides b b', shown in Fig. 1 as secured to two metal bars or carriers b^2 b^3, extended through suitable guideways between two plates b^4 b^5, fastened together, as by screws b^6, and supported by a bracket $b^\times$, fastened to the cam ring or cylinder a^8, as by a screw b^{20}, one of the said carriers, as b^2, being stationary and the other movable in its guideway, as will be described. The carrier b^2 is fixed so that its thread-guide b is in position to have its thread engaged by the cylinder-needles. The movable carrier b^3 has secured to it, as herein shown, a plate or bar b^{10}, provided with a slot or opening, through which is extended an actuating device (shown as a spring-actuated lever b^{12}, pivoted at its lower end, as at b^{13}, to a boss or projection b^{14} on the cam-ring a^8.) The spring-actuated lever b^{12} is provided with a stud or projecting arm or rod b^{15}, which is engaged and acted upon by cams b^{16}, preferably forming part of a ring detachably secured on the inner face of a disk b^{17}, as shown, by screws b^{18}, diametrically opposite one another, (see Fig. 2,) the said screws being extended through slots b^{19} in the said disks. The cam-ring b^{16} is mounted on a hollow hub b^{20}, secured to or forming part of the disk b^{17}, and the said disk and hub are loosely mounted on a bolt b^{21}, secured to the cam-ring a^8, the said disk and hub being frictionally held in proper or adjusted position by the spring b^{22}, encircling the rod b^{21} outside of the disk b^{17}.

The disk b^{17} is provided on its periphery with a series of projections c, which are adapted, as herein shown, to strike two studs or uprights c' c^2 on levers c^3 c^4, pivoted, as at c^5 c^6, to the bed-plate a, the said levers being joined together, as herein shown, by a pivoted rod, bar, or lever c^8, extended up through the bed-plate and through slots c^7 in the overlapping ends of the said levers, as clearly shown

in Figs. 1 and 2. The rod or bar c^8 is pivoted, as at c^9, to an arm or projection c^{10} on the bracket a', the lower end of the said rod being adapted to be acted upon by one or more cams c^{12} on the pattern-chain a^3. The cam-ring a^8 has secured to it, as by screw c^{14}, a bracket c^{15}, extended outward from the cam-ring, and having secured to or forming part of it an upright sleeve c^{16}, provided with a vertical slot c^{17}, into which is extended a pin c^{18} on a rod c^{19}, extended through and movable in the said sleeve. The rod c^{19} has secured to or forming part of it at its lower end a shoe c^{20}, upwardly bent at one end, as at 3, and at its upper end the said rod, as herein shown, has secured to it, as by screw c^{21}, a cap c^{22}, provided with a cross piece or bar c^{23}, upon which rests one arm 4 of a lever c^{24}, pivoted, as at c^{25}, to an upright c^{26}, secured to the dial-cap c^{27}, the other arm 5 of the said lever being extended down and normally kept pressed against the circumference or edge of the dial-cap by a spring c^{40}, secured to the lever c^{24} and to the bracket c^{15}, the said arm 5 acting as a catch or nipper to hold the re-enforcing thread while it is not being knitted, the arm 5 of the said lever releasing the re-enforcing thread when the rod c^{19} is raised, as will be described.

In the normal operation of the machine plain knitting is produced, and at such time the highest portion of the cam b^{16} acts on the rod b^{15} and forces the spring-actuated lever b^{12} in toward the cam-ring, thereby carrying the thread-guide in toward the center of the machine within the needle-cylinder.

To re-enforce the garment at certain points—as, for instance, at the knee of a stocking—I have provided the pattern-chain with a cam or lump c^{12}, so placed as at the proper time to act upon the lower end of the lever c^8, pivoted at c^{10}. This cam or lump c^{12} is so located that when the re-enforcing is to take place it will in the movement of the chain contact against one side of the lower end of the lever c^8, as represented in Fig. 1, thus throwing the upper end of the said lever inward, thereby moving the levers c^3 c^4 from their full into their dotted line positions, thus placing the studs or posts c' c^2 in the path of movement of the disk b^{17}, so that on the next revolution of the cam-ring a^8 in the direction indicated by arrow 40, Figs. 1 and 2, one of the projections c (marked 10 in Fig. 1) strikes the post c' and the disk b^{17} is rotated in the direction indicated by arrow 41, bringing the narrowest or smallest portion of the cam b^{16} into engagement with the arm or rod b^{15}, thereby permitting the lever b^{12} to be moved outward by the spring d and carry the thread-guide carrier b^3 from the center of the machine outward a sufficient distance to place the thread-guide b' outside of the cylinder-needles, thus drawing the thread across the said cylinder-needles and into position to be engaged by them. Immediately after the disk b^{17} has passed by the post c' the shoe c^{20} rides up over the said post, thereby raising the rod c^{19} and lifting the arm 4 of the lever c^{24}, turning the said lever on its pivot and moving the arm 5 out away from the dial-cap, thus releasing the thread passing through the guide b' and leaving it free to be engaged by the cylinder-needles and knitted to form the re-enforce. The machine will knit with both threads until in the revolution of the cam-ring a second projection c (marked 12) on the disk b^{17} strikes the post c^2 on the opposite side of the machine. When the projection c (marked 12) strikes the post c^2, the said disk is turned still farther in the direction of arrow 41 and the raised or highest portion of the cam b^{16} brought into engagement with the arm b^{15} of the spring-actuated lever, thereby forcing the said lever in toward the cam-ring and moving the carrier b^3 in toward the center of the machine to place its thread-guide b' inside of the cylinder-needles. Immediately after the disk b^{17} has passed by the post c^2 the shoe c^{19} rides over the said post and opens the thread-nipper—that is, the arm 5 of the lever c^{24} is moved away from the dial-cap—and as soon as the shoe has passed beyond the post c^2 the lever c^{24} is brought against the dial-cap and firmly nips the thread, and on the continued movement of the cam-ring a^8 in the direction of arrow 40 the thread between the nipper and cylinder-needles is broken off from the knitted goods, the said thread being still held between the nipper and the thread-guide. In this manner a re-enforcing course is knitted and the machine will continue to thus knit as long as the cam c^{12} remains in engagement with the lever c^8. The cam c^{12} is made of suitable length to engage the lever c^8 until the desired or required amount of re-enforce is knitted, and, as herein represented, the said cam is made of a length sufficient to enable only a small re-enforce to be knitted, and if a long re-enforce is to be knitted the cam c^{12} will be made longer than shown. The cam-ring b^{16}, as herein shown, is provided with three steps or cams; but in practice only two of said steps are employed—viz., the highest and lowest.

I claim—

1. In a circular-knitting machine, the combination, with the needle-cylinder, the cam-ring a^8, a stationary thread-guide, and a movable thread-guide and its carrier, of a disk b^{17}, pivoted to the cam-ring a^8 and provided with one or more cams, an actuating device for the movable carrier operated by the said cams to effect the movement of the movable thread-guide carrier, levers c^3 c^4, provided with posts c' c^2 to rotate the disk b^{17}, a pattern-chain, and a lever c^8, connected to the levers c^3 c^4 and acted upon by the pattern-chain to move the said levers, substantially as described.

2. In a circular-knitting machine, the combination, with the needle-cylinder to carry needles, the cam-ring a^8, the stationary thread-guide, the movable thread-guide and its carrier, and an actuating device for said mov-

able carrier, of a disk b^{17}, provided with studs or projections, a cam b^{16}, attached to the said disk to operate the actuating device for said movable carrier, levers c^3 c^4, pivoted to the bed-plate and provided with posts, the lever c^8, extended through the bed-plate and connected to the levers c^3 c^4, and a pattern-chain provided with a cam or cams to act on the lever c^8, substantially as described.

3. In a circular-knitting machine, the combination, with the needle-cylinder to carry needles, the cam-ring a^8, the stationary thread-guide, and the movable thread-guide and its carrier, of a spring-actuated lever b^{12}, connected to the said movable carrier and provided with an arm b^{15} and a disk b^{17}, pivoted to the cam-ring and provided with one or more cams to act on the arm b^{15}, levers c^3 c^4, provided with posts c' c^2, a lever c^8, connected to the levers c^3 c^4 to move the same, and a pattern-chain to operate the lever c^8, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEON C. HUSE.

Witnesses:
S. F. GALLAGHER,
L. FLORENCE LEAVITT.