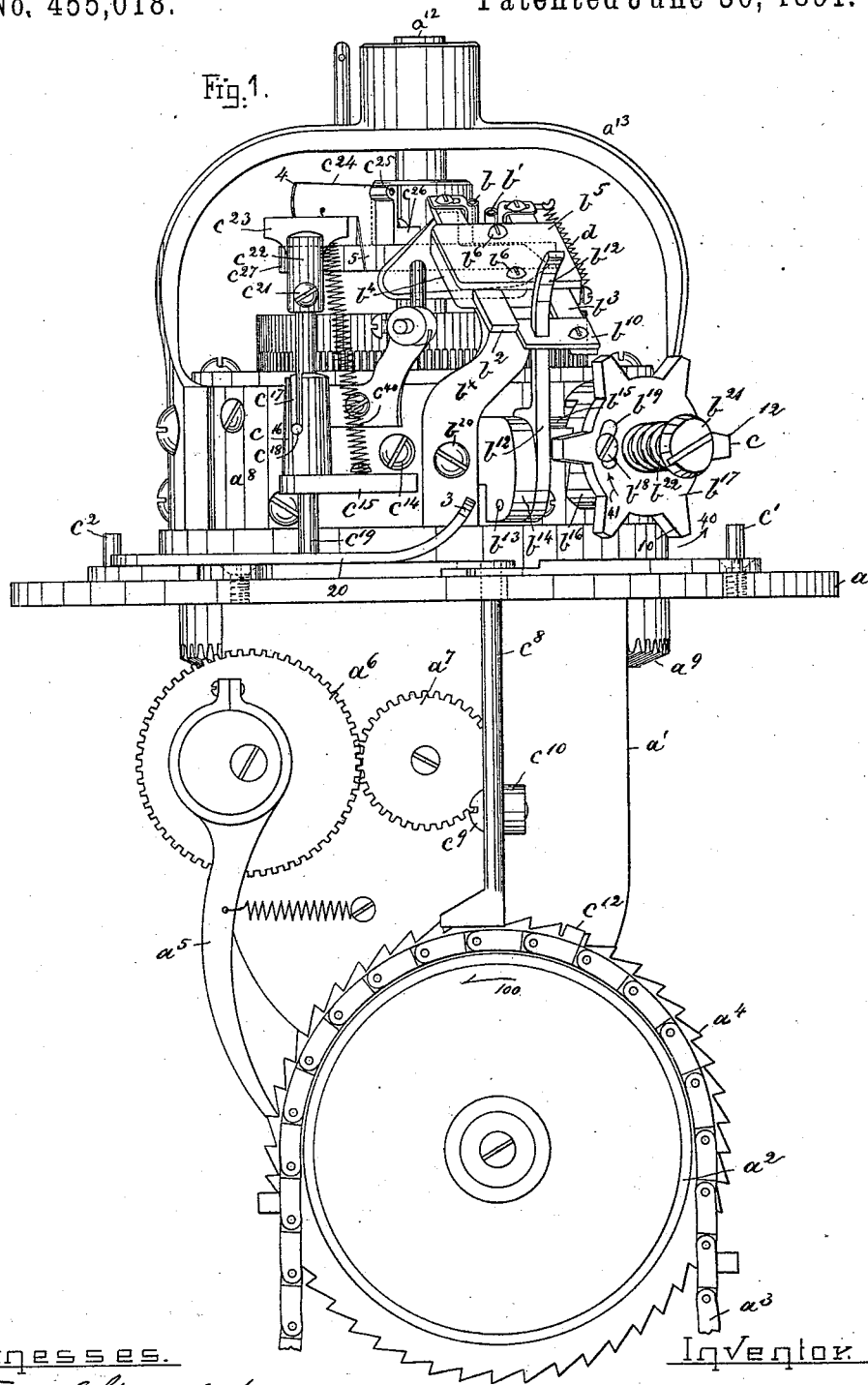


L. C. HUSE.

FEEDING MECHANISM FOR CIRCULAR KNITTING MACHINES.

No. 455,018.

Patented June 30, 1891.



Witnesses.

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Edward Allen

Inventor.

Leon C. Huse.
by Lemby Gregory attys.

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Fig. 4.

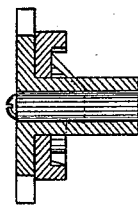


Fig. 3.

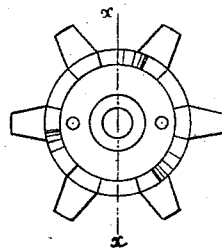


Fig. 5.

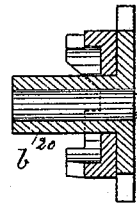
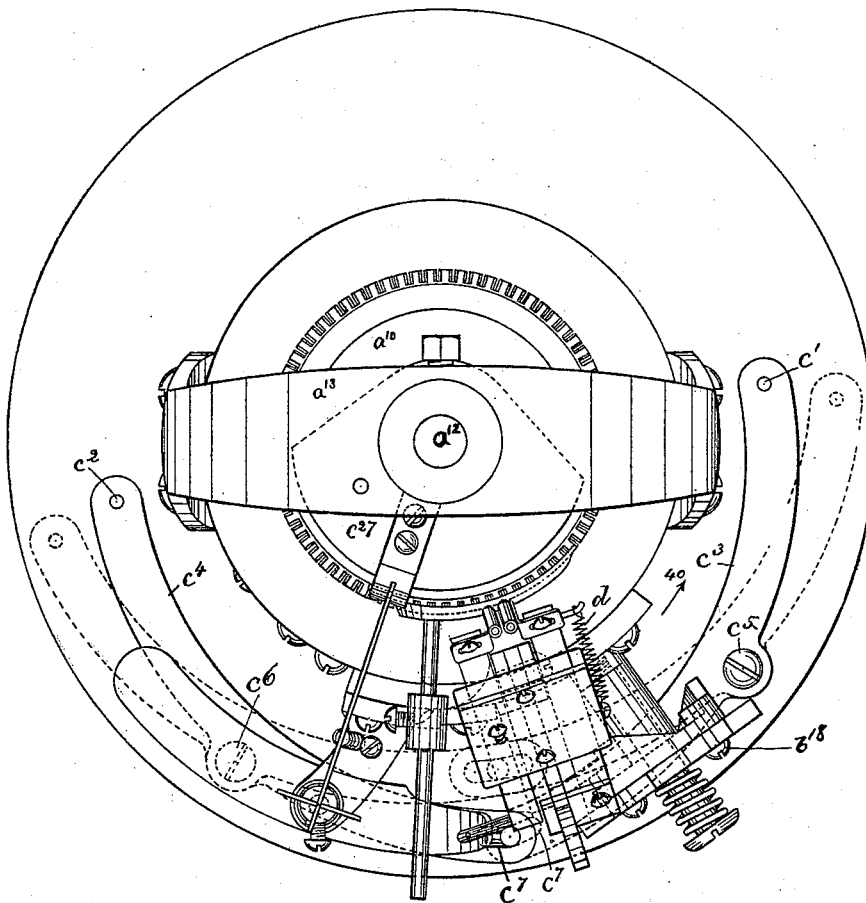


Fig. 2.



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.

10 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.

35 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.

45 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 ratchet-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 55 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 bb' , 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^x , 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 80 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 85 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' in the overlapping ends of the said levers, as clearly shown 100

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
 5 cams c^{12} on the pattern-chain a^3 . The cam-ring c^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
 10 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,
 15 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
 20 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} ,
 25 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.

30 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
 35 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
 40 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
 45 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
 50 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^3 in the direction indicated by arrow 40, Figs. 1 and 2, one of the projections c (marked 10 in Fig. 1) strikes
 55 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
 60 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
 65 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
 75 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
 80 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
 90 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
 95 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
 100 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
 105 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}
 110 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^3 , a stationary thread-guide, and a movable thread-guide and its carrier, of a disk b^{17} , pivoted to the cam-ring a^3 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
5 bed-plate and provided with posts, the lever c^3 , 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^3 , substantially as described.
10 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 pro-

vided 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
20 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.