(No Model.)

T. C. CHAWNER.

CIRCULAR KNITTING MACHINE.

No. 357,816. Patented Feb. 15, 1887.

Fig. 1.

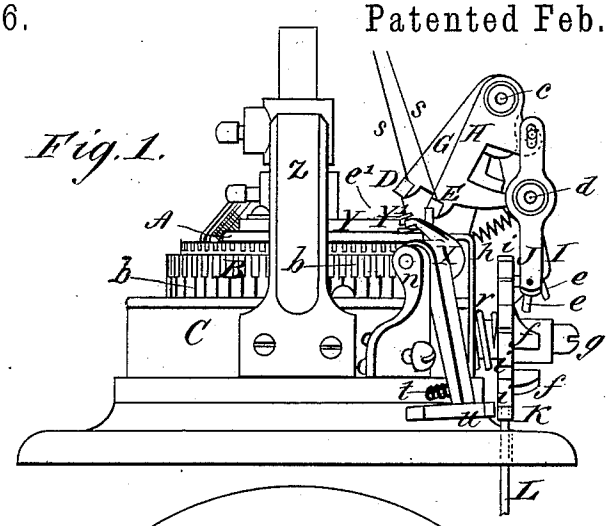


Fig. 2.

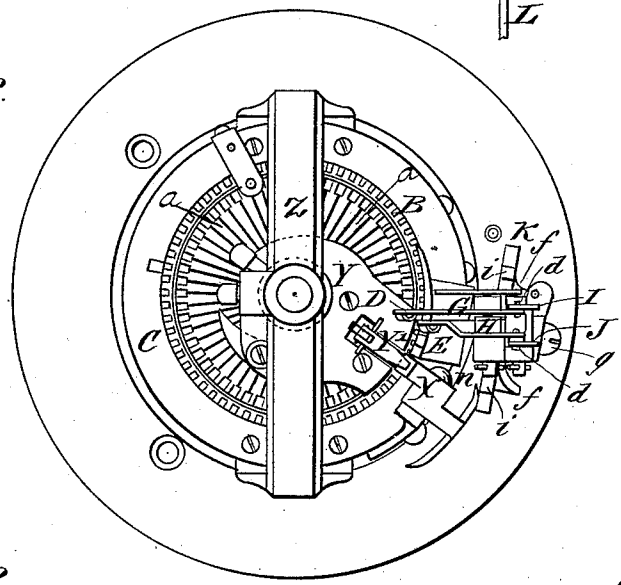


Fig. 3.

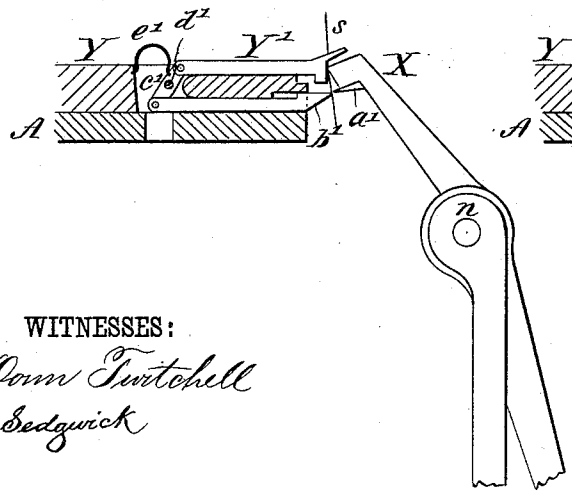
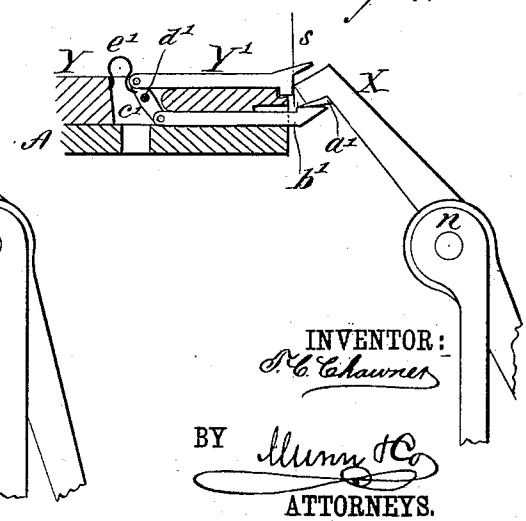


Fig. 4.



WITNESSES:

Donn Twitchell

C. Sedgwick

INVENTOR:

T. C. Chawner

BY Munn & Co

ATTORNEYS.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

THOMAS C. CHAWNER, OF NEW YORK, N. Y.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 357,816, dated February 15, 1887.

Application filed January 27, 1886. Serial No. 189,938. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. CHAWNER, of the city, county, and State of New York, have invented new and useful Improvements in Circular-Knitting Machines, of which the following is a full, clear, and exact description.

This invention more especially relates to knitting-machines having two sets of needles for knitting ribbed work, and in which single threads of different colors are used for making striped work. In machines of this description—as, for instance, the machine for which Letters Patent No. 239,168, were granted to Warren D. Huse on March 22, 1881—the threads are usually carried in or out of the work by guides, and as the thread is so carried it is automatically caught by a catch-lever or hammer connected with a revolving ring and arranged so that its upper end, under the action of the spring, is pressed against the edge of a plate secured to the shaft of the dial cam-plate and revolving ring of the machine. This serves to securely hold the thread thrown out of the work, and said catch-lever is opened or swung back by suitable mechanism to let one thread out and the other thread in at each change. The thread, having been caught by the hammer or catch-lever, is held from paying out, and, as the thread-guide and catch-lever continue to pass around the thread by reason of the pull upon it, is broken off near the work, and the other thread alone continues the knitting, the end of the broken thread still being held securely by the catch-lever, ready to be brought into the work again at the next shifting of the thread-guides. This breaking of the thread near the work, by pull upon it while under grip by the catch-lever, answers when the thread is composed of soft or loose wool fibers; but it is not suitable for working hard twisted yarn, as the strain would then be too great for the needles, or would otherwise be liable to damage the machine and interfere with the work.

The object of my invention is to provide, in such a machine or machines, for working hard twisted yarns; and the invention consists in special cutting means, in combination with the catch-lever and block against which it works, for automatically severing the yarn with a shears-like cut, subject to control by the hammer or catch-lever, and before the hammer or catch-lever releases its hold on the thread or yarn.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a partial side view of the improved circular-knitting machine on which Letters Patent No. 239,168 were granted March 22, 1881, with my invention in one of its forms applied thereto; Fig. 2, a top view of the same; and Figs. 3 and 4, side views of the hammer or catch-lever, with a sliding block against which it works, and special cutting means for severing the yarn, also showing in section portions of the dial-plate of the machine and plate mounted thereon, said views showing respectively the cutting means as controlled by the hammer or catch-lever immediately prior to their severance of the yarn and subsequently thereto, or after the cut has been made.

As the machine which I have selected for illustrating the application of my invention is already well known, only such reference will here be made to its several or leading parts and its general operation as is necessary to elucidate my invention.

A is the revolving dial-plate, and *a a* the one set of needle-guides. B is the outer cylinder, and *b b* the other set of needle-guides for knitting ribbed work.

C is the revolving ring, carrying the two thread guides or carriers D E, each of which is designed to be supplied with a different-colored thread or yarn. G H are the swinging arms, which carry the thread-carriers D E, and which swing on a pin, *c*, radially toward and from the center of the machine. These thread-carriers D E are alternately placed in position, one outward to deliver the thread to the needles and the other inward back of the needles, so that its thread will not be taken by the needles.

I J are the levers, pivoted at *d* to a support carried by the revolving ring C, for alter-

nately shifting the thread guides or carriers D E to their respective positions, said levers each carrying at their lower ends a stud or pin, *e*, for operation by cam projections *f f* on a vertical-faced cam-disk, K, which revolves on a pivot, *g*, carried by the revolving ring C. These cam devices and levers are so arranged that a thread guide or carrier is moved inward by them to throw its thread out of the work, and the corresponding thread-carrier is moved outward to bring its thread to the work. The backward movement of the levers is effected by counter-springs *h*. The cam-disk K is or may be operated by a rod, L, arranged to act against teeth *i i* on said disk, as described in the Letters Patent No. 239,168, hereinbefore referred to, provision being made for raising and lowering the rod L, to put it into or out of action with the cam-disk as said disk comes round to the rod, accordingly as it is required to change the thread or to proceed with the knitting without change of thread. The cam-disk is held in position after each movement thereof by the rod L by means of a friction-spring, *r*, bearing against its rear surface.

X is the catch-lever or hammer for automatically holding the thread or yarn *s* as the latter is carried by its guide or carrier out of the work. Said lever or hammer is pivoted at *n* to a holder on the revolving ring C, and its upper end is pressed against the edge of a sliding block, Y′, fitted and virtually forming a part of said plate, which is secured to the shaft of the dial cam-plate and revolving ring C. This pressure of the hammer, which should be sufficient to securely hold the thread thrown out of the work, is produced by a spring, *t*, and the hammer or catch-lever is opened or swung back from the block Y′ to let one thread out and the other thread in at each change by a cam, *u*, so formed and arranged that directly after the cam-disk K is moved by the rod L to shift the thread guides or carriers this cam *u* also in turn strikes the rod L, which presses the lower end of the catch-lever or hammer inward and the upper end outward or open, after which the spring *t* again closes the catch-lever or hammer as soon as its cam passes by the rod L.

When the rod L is dropped to not operate the cam-disk, it does not operate the hammer.

The threads or yarns used in the knitting are wound on bobbins carried on the yoke *z*, attached to the revolving ring C in the usual manner.

The thread or hard twisted yarn having been caught by the hammer X, is held from passing out, and it is at this point, and as the thread guide or carrier and catch-lever or hammer continue to pass around, that the yarn is severed near the work, and the other thread or yarn alone continues the knitting, the severing, which is effected automatically, taking place before the catch-lever or hammer lifts from its hold on the yarn, and so that the end of the severed yarn will be held securely by the catch-lever or hammer, ready to be brought into the work again at the next shifting of the thread guides or carriers. A cutting device or devices is combined with the hammer for operation automatically in relation with the hammer, as above described, preferably having a shearing action and moved by and in concert with the hammer. Thus the hammer X is fitted with a cutting-blade, *a′*, and the plate Y with a sliding cutter, *b′*, which, when moving one over the other in reverse directions, sever the yarn in a shearing manner, but not until the hammer, as shown in Fig. 3, has got its hold on the yarn. Shortly, however, after the hammer has got its hold on the yarn, by pressing or bearing it against the end of the sliding block Y′ in or on the plate Y, the continued inward movement of the acting end of the hammer causes the block Y′ to be correspondingly moved, and by a rocking beam or lever, *c′*, pivoted, as at *d′*, to the plate Y, and arranged to connect at its opposite ends the sliding block Y′ and cutter *b′*, causes said cutter to be moved forward in a reverse direction to the hammer-cutter *a′*, and thus produce a shearing severance of the yarn, as shown in Fig. 4, leaving the hammer still to hold on to the severed portion of the thread or yarn. A spring, *e′*, is applied to the sliding block and its connected cutter *b′*, to readjust said cutter and block to their normal positions, as shown in Fig. 3, and to give the necessary resistance to the sliding block to secure the hammer's hold of the thread or yarn.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the hammer or catch-lever, the spring acting upon the hammer or catch-lever, the revolving ring carrying said hammer, and the body or surface against which the hammer acts to hold the thread or yarn, of the cutting device consisting of a blade or cutter carried by said hammer and a blade or cutter connected to the said body or surface upon which the hammer acts, substantially as and for the purpose specified.

2. The combination, with the hammer or catch-lever carrying a cutter or blade, the spring acting upon the said hammer or catch-lever, the revolving ring carrying said hammer, and the movable body or block against which the hammer acts, of the movable cutter or blade actuated by said movable body or block, substantially as and for the purpose set forth.

3. The combination, with the hammer or catch-lever carrying a cutter or blade, the spring acting upon the said hammer or catch-lever, the revolving ring carrying said hammer, and the movable block or body against which the hammer acts, of the spring acting upon the said movable block and the movable cutter actuated by said movable block to co-

operate with the blade or cutter of the hammer or catch-lever, substantially as and for the purpose specified.

4. The combination of the cam-plate Y, the movable block Y′, the beam or lever *c′*, the spring *e′*, the revolving ring C, and the hammer or catch-lever X and its attached cutter *a′*, the spring *t*, and the cutter *b′*, substantially as shown and described, and for the purpose herein set forth.

THOMAS C. CHAWNER.

Witnesses:

A. GREGORY,

C. SEDGWICK.