

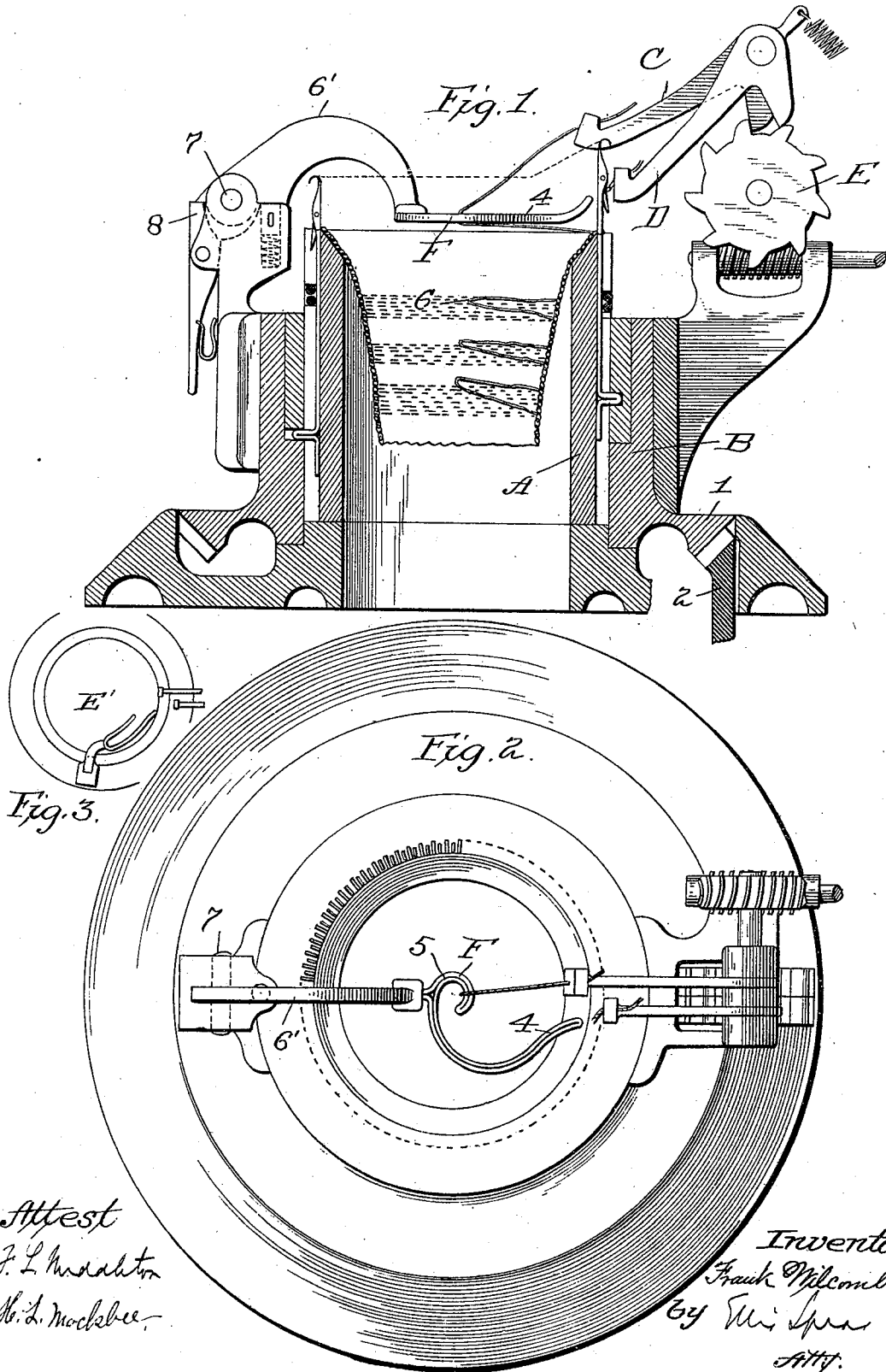
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Patented Mar. 20, 1900.

F. WILCOMB.
CIRCULAR KNITTING MACHINE.

(Application filed Sept. 1, 1898.)

(No Model.)



Attest
J. L. Knudsen
H. L. Madsen.

Inventor
Frank Milcomb
By Eli Spear
Atty.

UNITED STATES PATENT OFFICE.

FRANK WILCOMB, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR TO THE
STANDARD MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,676, dated March 20, 1900.

Application filed September 1, 1898. Serial No. 690,056. (No model.)

To all whom it may concern:

Be it known that I, FRANK WILCOMB, a citizen of the United States, residing at Pawtucket, Rhode Island, have invented certain new and useful Improvements in Circular-Knitting Machines, of which the following is a specification.

My invention relates to circular-knitting machines of that class in which a plurality of threads are fed to the needles to produce striped or reinforced work and in which the threads thrown out of work remain attached to the inner side of the tubular fabric.

It is the object of my invention to provide means for taking care of the threads which are out of work and which in the continued revolution of the machine become twisted and entangled, tending to draw the fabric up through the cylinder and interfering with the successful working of the needles and also drawing and distorting the loops of the fabric where the threads are attached to it or breaking the thread away from the fabric in the case of tender yarn. My invention is designed to obviate these difficulties and defects by providing a thread-engaging device which in the revolution of the machine engages the loosely-attached inactive thread and draws it to the center of the cylinder, where it is held, so as to prevent it from interfering with the work.

In the drawings, Figure 1 is a central vertical section of a circular-knitting machine of ordinary type with my improvements attached. Fig. 2 is a plan view, and Fig. 3 a view of a modification.

In the drawings the needle-cylinder A is stationary, and the cam-ring B is rotated through the gearing 1 2. The thread-feed arms C D are controlled by a pattern-wheel E to throw the threads in and out of work, all these parts being of any ordinary form.

My invention consists of a take-up finger or thread engaging and measuring device F, arranged to work inside of the needle circle, having a scroll form, the longer curved end 4 of the scroll reaching out near to the needle row just back of the thread-feeds. This end of the thread-engaging device or scroll I pre-

fer to give a slight curve upward to enable it more readily to pass above the thread that is attached to the fabric in the first few revolutions of the machine after the thread has been thrown to the center of the cylinder by being caught by the engaging device, as shown in Fig. 1. The smaller curved end or eye 5 of the scroll works approximately in the center of the circle of needles. As the cam-ring revolves this thread finger or scroll engages the loosely-attached thread extending from the thread-guide to the fabric and draws it to the center of the needle-cylinder to the small part of the scroll, thereby drawing the yarn from the spool or supply. This thread-finger is set slightly above the top of the needle-cylinder, so that the thread-finger will pass above the thread where it is attached to the fabric, and at each revolution of the machine the thread is passed underneath the thread-finger, preventing the fabric from lifting. As the fabric feeds down through the cylinder more yarn is drawn from the supply end, and this strand or all the strands are held taut and never become slack or interfere with the work. When any one of these inoperative threads are brought into action again, the loop end is still held by the scroll until the needle has drawn the new thread into the body of the fabric, when the long upturned end of the scroll will immediately pass above this part of the thread, and the continued revolution of the machine will allow the loop (both ends of which are now attached to the fabric) to slip off the small curved end of the scroll. This thread is now attached to the fabric in two places and hangs loosely on the inside of the fabric in the form of a loop, as at 6, Fig. 1.

It will be understood that any number of threads may be extending down the inside of the tube and in consequence of the revolutions of the machine become twisted; but at each revolution of the machine the scroll draws a new supply of yarn, which will enable the twisting to go on without allowing the fabric to rise in the cylinder or the loops being drawn or distorted. In the case of a reinforced fabric where only one strand of

thread is used in addition to the main thread this scroll operates on this reinforcing-thread in the same manner, keeping it taut at all times, preventing the thread from flying into engagement with the needles, and thus making imperfections in the fabric.

I have illustrated my invention as used in connection with a machine having vertical latch-needles, the needle-bed being stationary, the cam-ring and thread-fingers and scroll revolving, it being understood, however, that it may also be used on a machine where the needle-cylinder revolves and the cam-ring is stationary, in which case the scroll is also stationary. The device may also be used in connection with machines having radial needle-beds or needle-beds of a conical form. It may also be used with machines of the spring-needle type, where the fabric passes down through the cylinder.

It is desirable at times to remove the scroll from inside the needle row in order to enable a ribbed fabric to be transferred to the needles or for other purposes, and I have provided means by which this may be done, said means consisting of an arm 6', carrying the thread-engaging device, pivoted at 7 to a bracket on the cam-ring and held in operative position by a pivoted latch 8. By throwing this latch out the arm 6', with the thread-engaging device or scroll, may be removed from working position, leaving the cylinder entirely unobstructed from the top. I do not wish to limit myself to the exact location of the engaging point of this scroll-surface with relation to the thread-fingers, as the operation of the thread-engaging device would be the same if the scroll or device were set back even a half-turn.

I do not wish to limit myself to an engaging device of the exact scroll-like form shown, as I am aware that surfaces of other forms would catch and hold the threads, and the scroll may be made in a manner different from that shown. I have illustrated in Fig. 3 one instance of the manner in which the engaging device may be modified, which figure shows the device in the form of a hook E of substantially U shape.

I claim—

1. In combination with a circular-knitting machine having multiple feed devices, a thread-engaging device inside of the needle row to engage the inactive or floating thread extending from the fabric to the feed and hold it inside the needle circle until introduced to the needles, substantially as described.

2. In combination with a circular-knitting machine having multiple feed devices, a thread-engaging device having a scroll-like surface to engage the inactive or floating threads on the inside of the fabric, substantially as described.

3. In combination with a circular-knitting

machine having multiple feed devices a thread-engaging device inside of the needle row and having a scroll-like surface to engage the inactive or floating threads, said surface extending approximately from the inner periphery of the cylinder to the center thereof, substantially as described.

4. In combination with a circular-knitting machine having multiple feed devices, a thread-engaging device inside the needle row to guide and hold the inactive floating threads extending from the fabric to the feed out of engagement with the needles and adapted to release the thread when it is introduced to the needles again, substantially as described.

5. In combination, the multiple feeds, the needle-cylinder, and a take-up device having an arm with one end near the inner side of the cylinder to engage the thread, said arm extending toward the center of the cylinder to draw the inactive thread toward the center and to release it when introduced again into the fabric, substantially as described.

6. In combination with a circular-knitting machine having multiple feed devices, a thread-engaging device inside of the needle row to engage the inactive or floating thread extending from the fabric to the feed and hold it inside the needle circle until introduced to the needle, said thread-engaging device having a laterally-open mouth, substantially as described.

7. In a circular-knitting machine, in combination, a thread-carrier and means to move the thread-carrier in and out of operative position, and a device within the needle-cylinder adapted to catch and retain the thread when the carrier is out of operative position.

8. In a circular-knitting machine, in combination, a plurality of thread-carriers, and means to move one or more of said thread-carriers in and out of operative position, and a device within the needle-cylinder adapted to catch and retain the thread to the carrier out of operative position.

9. In a circular-knitting machine, in combination, a plurality of thread-carriers and means to move one or more of said thread-carriers in and out of operative position, and a device within the needle-cylinder adapted to catch and retain the thread of the carrier out of operative position, and means to cause the said device to travel with the thread-carrier.

10. In a circular-knitting machine, in combination, a thread-carrier and means to move said thread-carrier in and out of operative position, a cam having a spiral face, the interior of said spiral face being in alignment with the thread of the carrier when out of action.

11. In a circular-knitting machine, in combination, a plurality of thread-carriers and means to move one or more of said thread-carriers in and out of operative position, a

cam having a spiral face, the exterior of the said spiral face being in alinement with the carriers out of action.

5 12. In a circular-knitting machine, in combination, a plurality of thread-carriers and means to move one or more of said thread-carriers in and out of operative position, of a cam having a spiral face, the exterior of the said spiral face being in alinement with

the thread of the carrier out of action, and 10 means to cause said cam to travel with the thread-carriers.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK WILCOMB.

Witnesses:

HENRY E. COOPER,
L. B. MIDDLETON.