(No Model.) 2 Sheets—Sheet 1.

E. MURBY.

LOOPING ATTACHMENT FOR KNITTING MACHINES.

No. 409,856. Patented Aug. 27, 1889.

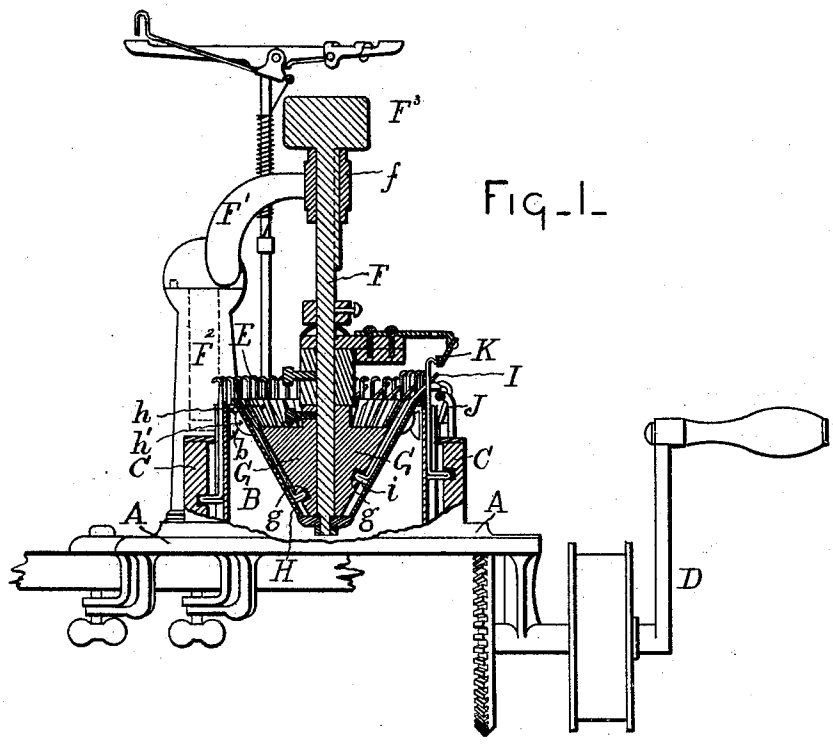
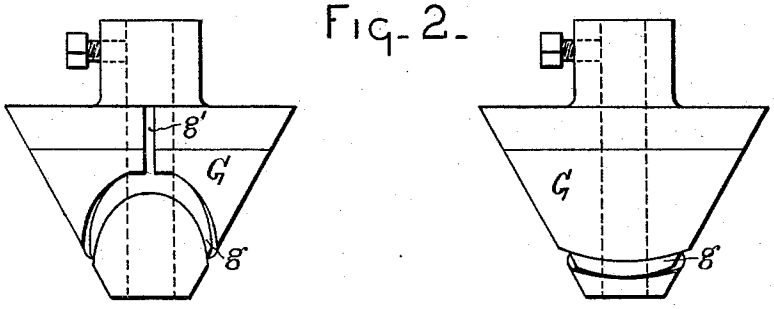


Fig. 1.

Fig. 2.



WITNESSES
C. J. Shipley
L. A. Dolty

INVENTOR
Edward Murby
By Wells W. Leggett & Co.
Attorneys.

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

(No Model.) 2 Sheets—Sheet 2.

E. MURBY.

LOOPING ATTACHMENT FOR KNITTING MACHINES.

No. 409,856. Patented Aug. 27, 1889.

Fig. 3.

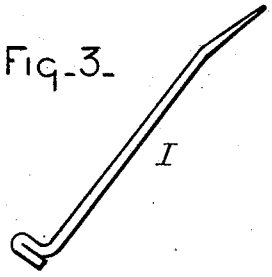


Fig. 4.

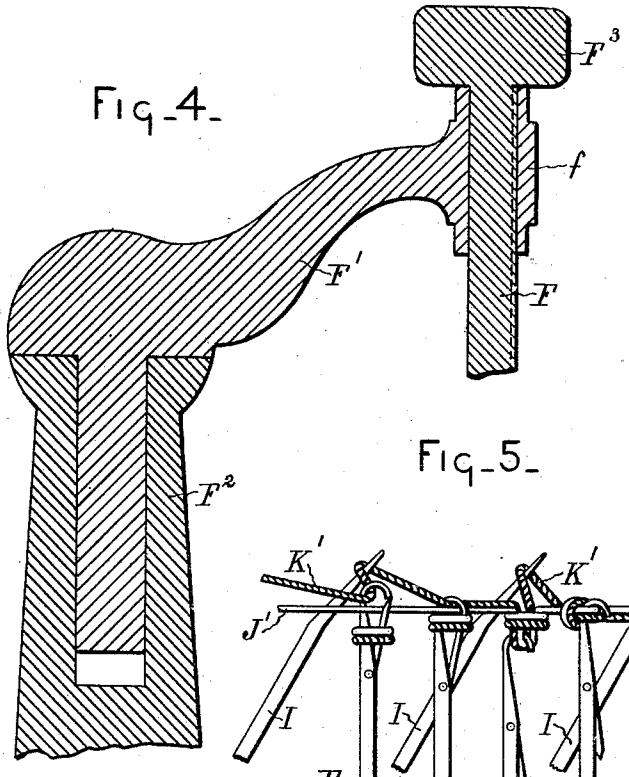


Fig. 5.

WITNESSES
C. F. Shipley
L. A. Duelty

INVENTOR
Edward Murby
By Wells W. Leggett & Co.
Attorneys.

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

UNITED STATES PATENT OFFICE.

EDWARD MURBY, OF DETROIT, MICHIGAN.

LOOPING ATTACHMENT FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 409,856, dated August 27, 1889.

Application filed May 1, 1889. Serial No. 309,272. (No model.)

To all whom it may concern:

Be it known that I, EDWARD MURBY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Looping Attachments for Knitting-Machines; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain improvements on a looping attachment for knitting-machines, for which Letters Patent were issued to me August 5, 1884, No. 302,928. In this patent the loops are formed by points operated by a cam and arranged to slide in radial grooves in a horizontal direction or in a direction at right angles to the needles. The construction was such that the loops were formed integral with or became a part of the body of the fabric, and it was found that while the yarn used to form the loops would of course appear on the inner face of the fabric in the form of loops the outer face would be striped alternately with the loop-thread and the foundation-thread, so that there was no possibility of the loop thread or yarn appearing on the outer face continuously, as is desired where solid-colored goods are wanted. The disadvantage of this result will be apparent on illustration. Suppose the operator wishes to form the loops and the outer face of the fabric of wool yarn, while it is desired to form the inner foundation of the fabric of cotton yarn, or suppose he desires to form the loops and the outer face of the fabric of some colored yarn, while the inner foundation is to be formed of white yarn. The disadvantage of having both colors appear on the outer face or of both the wool and the cotton showing on the outside will at once be seen. By my present construction, however, the yarn used to form the loops on the inner face is so fed to the needles and controlled by the position of the points that it will appear continuously on the outer face also, and the yarn used to form the inner foundation will be concealed.

In the drawings, Figure 1 is a sectional view of a machine embodying my invention. Fig. 2 shows views of the cone-cam. Fig. 3 is a view of one of the points. Fig. 4 is a detail view, in section, of the frame for supporting the looper attachment; and Fig. 5 is a diagrammatic view showing the operation of forming the stitches.

In carrying out my invention I have, as in my previous patent, shown my improvement embodied in what is familiarly known as the "Tuttle ribber-machine."

A is the supporting-frame; B, the needle-cylinder; C, the surrounding cam-cylinder; D, the crank geared with the needle-cylinder to revolve the same, and E the needles.

F is a stem supported by the arm F′, which is pivotally supported by the standard F^2.

G is a cam-cone rigidly engaged to the stem and provided with the cam-groove *g;* and H is the point-cone, supported by the stem F and adapted to revolve freely thereon, and provided with the grooves *h*, in which are supported the points I, the heels *i* of which enter the cam-groove *g*. Thus when the point-cone is revolved the points will receive their desired motion by the cam-groove *g*.

h′ are ears projecting from the point-cone and adapted to engage between the projections *b* on the needle-cylinder. Thus when the latter is revolved in either direction the point-cone will be carried with it.

J is the yarn-guide for feeding the inner foundation-yarn J′, and K is the guide for feeding the loop-yarn K′.

I will now proceed to show the distinctions between my present application and my former patent.

In both apparatuses the loop-yarn is formed with and becomes a part of the foundation, so that in forming a stitch both yarns work together. In my former patent the points were projected outwardly in a horizontal direction or in a direction at right angles to the needles. In this application, as will be seen, they are moved upward and downward in a diagonal direction between the needles at an angle of about forty-five degrees. There would thus be a tendency on the part of the point, when it held back the loop-yarn K′, to keep it close to the back of the needle, and thus allow the inner foundation-yarn J′

to come in in the position shown in Fig. 5—that is, above or in front of the loop-yarn. Then, in the course of the movement of the needle, when this stitch is brought up over the latch of the needle, the inner foundation-yarn is above the loop-yarn, and is consequently, as the stitch is thrown over the hook of the needle, thrown on the inside of the fabric, while the loop-yarn is brought to the outside.

Where the point projects in a horizontal direction, however, as in my former patent, the loop-yarn is held in a vertical position, and there being no tension exerted on it to keep it toward the back of the needle or behind the inner foundation-yarn it was apt to be fed to the needle in such a manner that when the stitch was formed the loop-yarn would sometimes be above the body-yarn on the needle, and would consequently sometimes be thrown to the inside of the fabric, and the inner foundation-yarn would thus sometimes appear on the outside.

By projecting the points upward in a diagonal direction the loop-yarn is always fed to the needle in the same relative position with respect to the inner foundation-yarn, and consequently the same yarn will always appear on the surface of the fabric.

The stem F may, if desired, be loosely supported in the sleeve *f* at the end of the arm F′, and the entire looping apparatus may thus be raised and swung to one side of the knitting apparatus.

F^3 is a weight on the end of the stem F to keep the looping mechanism down to its work. This is necessary, since the fabric working down between the needle-cylinder and the point-cone is apt to raise the latter up out of its position. Of course instead of a weight, its equivalent—as, for instance, a spring—might be used.

If desired, a groove or slot *g′*, extending from the cam-groove up to the top of the cone, may be provided. The points can then be readily removed from or inserted into the point-cone without detaching the latter from the stem and thus disarranging all the other points.

What I claim is—

1. In a looping attachment for knitting-machines, the combination, with the needles, the needle-cylinder, and means for operating the needles and cylinder, of a conically-shaped plate supported within said needle-cylinder and adapted to be revolved therewith, a series of points supported by said cone-plate, and means for projecting the points upward in a diagonal direction when desired, substantially as described.

2. In a looping attachment for a knitting-machine, the combination, with the needles, the needle-cylinder, and means for operating the needles and cylinder, of a cone-plate supported within the needle-cylinder and adapted to be revolved therewith, a series of points supported by said cone-plate, and a cam-groove in which the heels of the points are engaged for projecting the points upward in a diagonal direction, substantially as described.

3. In a looping attachment for a knitting-machine, the combination of the needle-cylinder, the needles, a cone-plate supported within the needle-cylinder and adapted to be revolved therewith, a series of points supported by said cone-plate, a cone-cam having the grooves *g* and *g′*, a standard having an arm for supporting the stem of the looping attachment, and a weight supported on the upper end of said stem to hold the looping mechanism down to its work, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWARD MURBY.

Witnesses:
W. H. CHAMBERLIN,
L. A. DOELTZ.