

(No Model.)

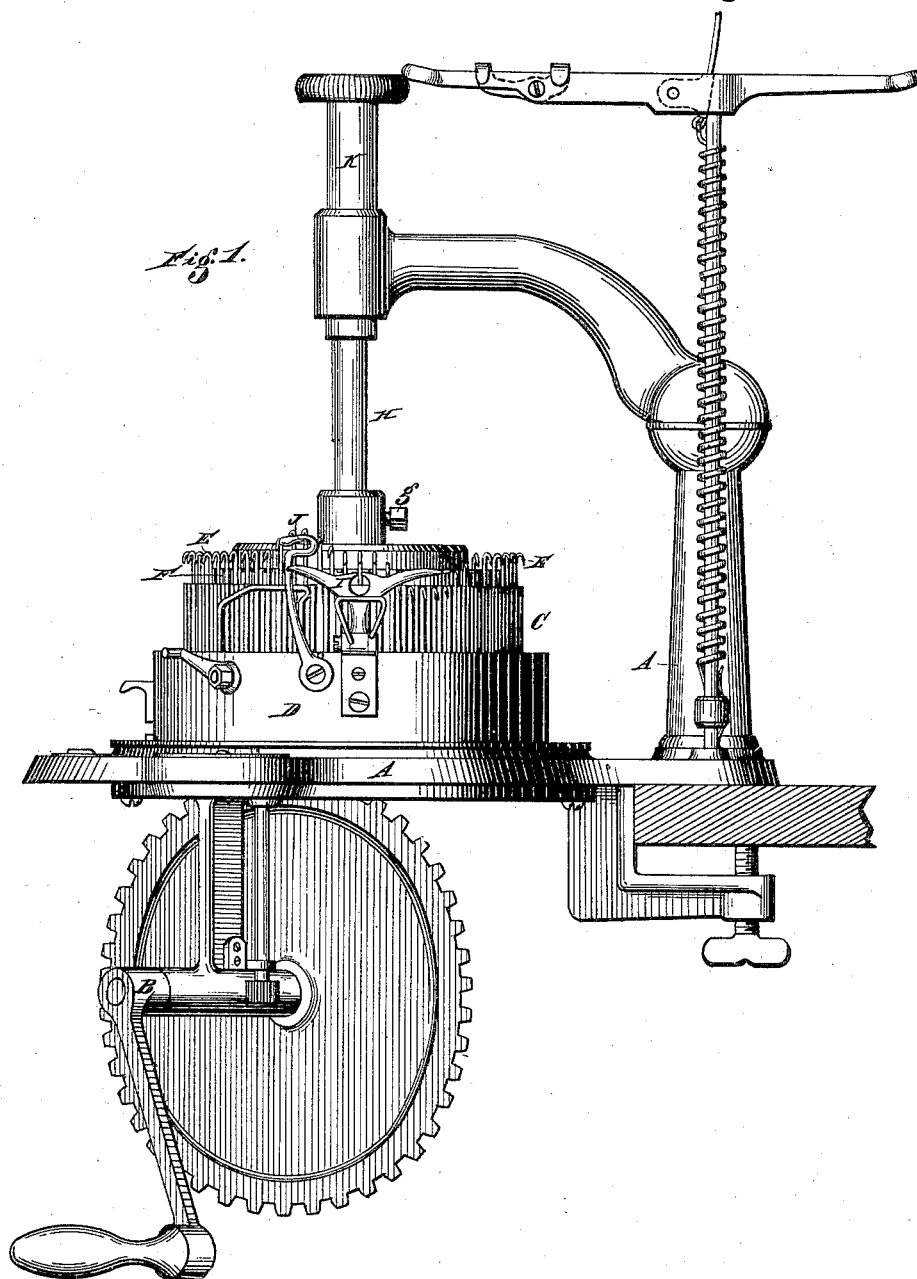
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E. MURBY.

LOOPING ATTACHMENT FOR KNITTING MACHINES.

No. 302,928.

Patented Aug. 5, 1884.



WITNESSES

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(No Model.)

3 Sheets—Sheet 2.

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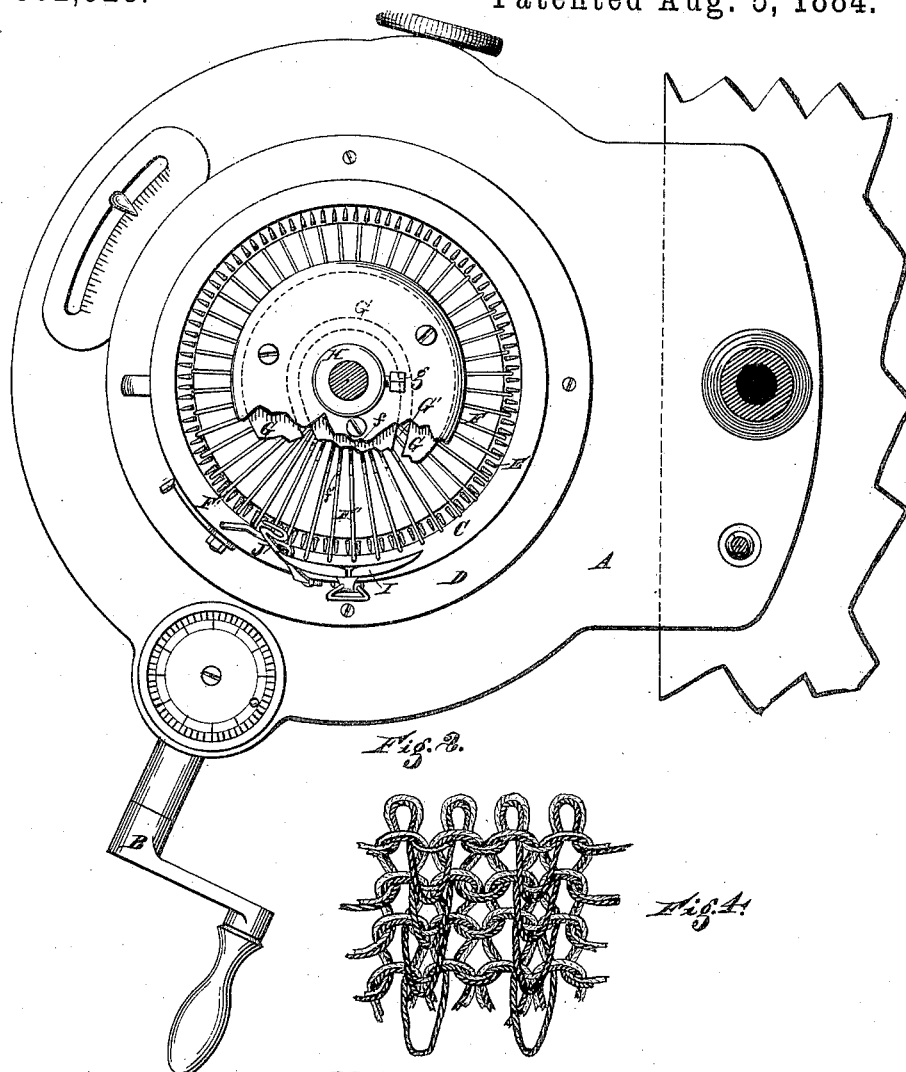


Fig. 3.

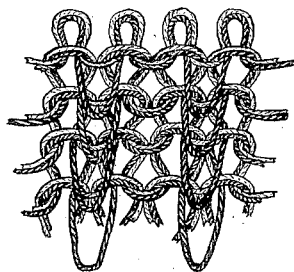


Fig. 4.

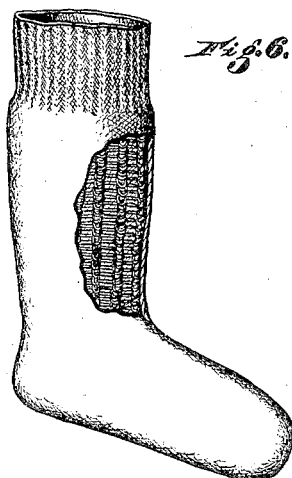


Fig. 5.

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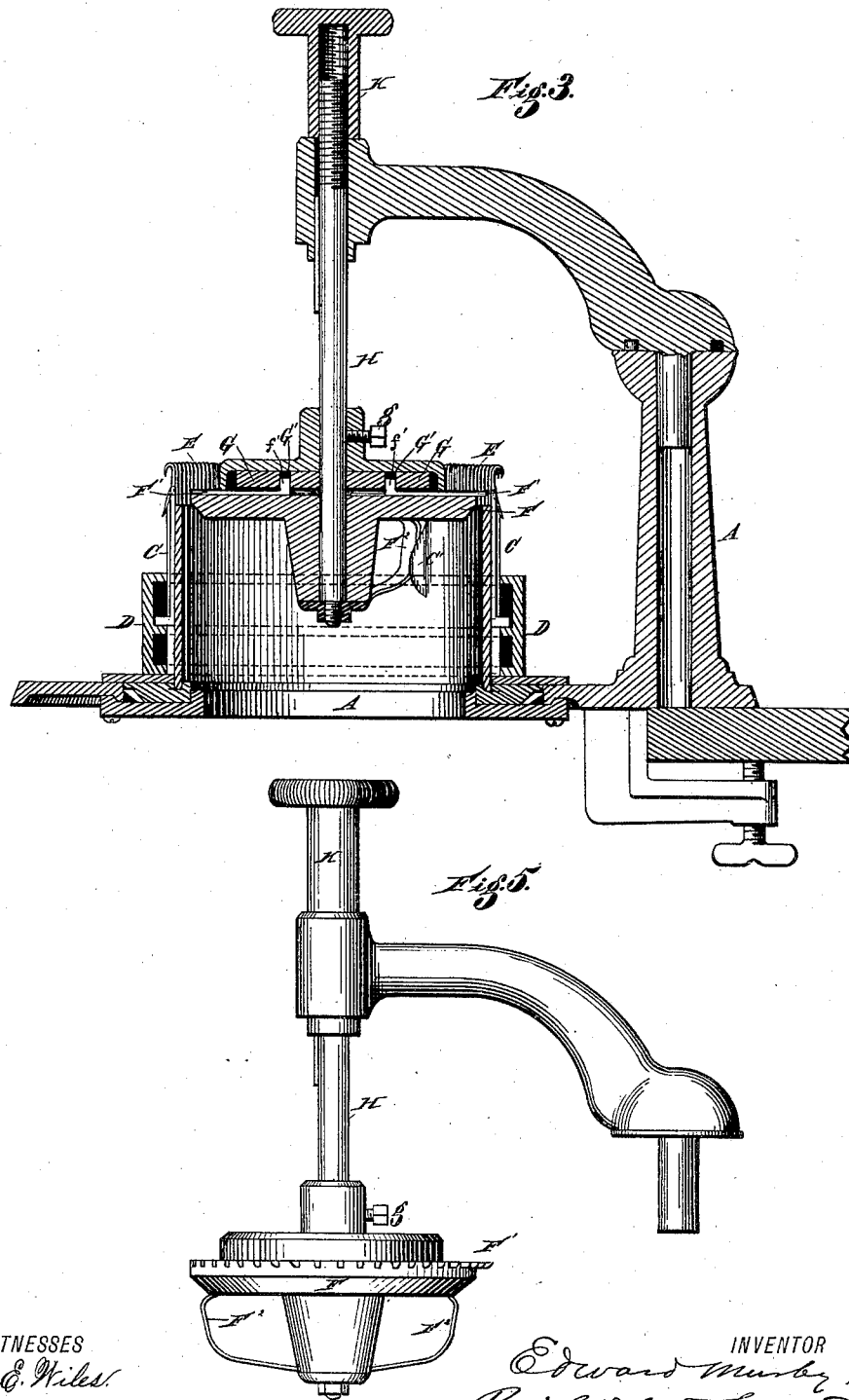
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UNITED STATES PATENT OFFICE.

EDWARD MURBY, OF YPSILANTI, MICHIGAN, ASSIGNOR TO ALFRED S. YOST,
TRUSTEE, OF SAME PLACE.

LOOPING ATTACHMENT FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 302,928, dated August 5, 1884.

Application filed October 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD MURBY, of Ypsilanti, county of Washtenaw, State of Michigan, have invented a 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 same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention is designed as an improvement upon what is known as the "Tuttle ribber machine," an illustration of such a machine being found in Patent No. 149,813, granted to Calvin R. Tuttle, April 14, 1874, and has for its object the formation of a knitted fabric having an interior surface of loops knitted into the fabric; and it consists in the means, their construction and combination, hereinafter particularly described, and then specified in the claims.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a plan view with the top of the machine removed, and showing a part of the dial cam-plate broken away. Fig. 3 is a vertical section of a knitting-machine and my attachment, showing the manner of applying the latter to the former and illustrating the working mechanism. Fig. 4 is a view of the fabric on an enlarged scale. Fig. 5 is a separate view of the looping attachment as it would appear detached from the machine. Fig. 6 is a representation of a sock knit upon my machine, with a part of the leg portion cut away to show the interior lining of loops.

Heretofore an article known as the "German sock" has been provided with an interior lining of loops, the said loops being sewed in by hand after the fabric has been knitted. There has also been made a sock provided with an interior lining of loops, in which loops have been formed by mechanism which would tuck a portion of the yarn or "end" in between the stitches which make up the body of the fabric. The said yarn, however, in that case was not knitted in so as to constitute a part of the fabric, but on the other hand could

be rove out or unraveled from the body of the fabric. It has also been proposed to raise a loop or pile on a knitted fabric by using in a warp-machine, in connection with a row of needles, a row of wire pins or points set in an upright position, "shogging" guides for wrapping yarn around the needles and points, and a slide-bar to push the wrapped yarn from off those parts, as set forth in the English Patent No. 1,157 of 1856. By my invention, however, the yarn which is to be made into the interior loops is by my improved mechanism knit into the fabric, so as to constitute a part of the body of the fabric, and not susceptible of being unraveled, except by the usual process of unraveling the entire fabric. Some valuable results are accomplished by reason of this feature. It enables me to locate the said loops in rows or groups wherever I may desire them upon the interior of the fabric, all the spaces between the said groups or rows of loops being a solid knitted fabric.

In carrying out my invention, I represent in the drawings a Tuttle ribber machine. A is its supporting-frame; B, the power-crank, geared in the usual way with the needle-cylinder C and its surrounding cam-cylinder D. E represents the ordinary knitting-needles.

I will now proceed to describe my improved looping attachment.

F is a plate or disk provided with grooves *f*, radiating from its center upon its upper surface.

F' represents a set of points located within the said grooves, arranged laterally to the line of movement of the needles, each point having a projecting lug or heel, *f'*, which engages with a cam-groove, G', in the cam-plate G. The cam-plate G is made stationary. The disk F is loose, so as to revolve freely about the stationary stem H.

F² represents lugs or ears upon the lower side of the disk F, which is made to engage corresponding ears, C', within the needle-cylinder, so that when the needle-cylinder is revolved it will carry the disk F around with it.

I represents the usual yarn-guide, and J the usual guide for the yarn employed with the Tuttle ribber.

The operation of the device will now be un-

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derstood. We will presume the fabric to have been knitted in the usual way, with a yarn in the guide I and another yarn in the guide J. Having worked the desired number of courses of plain knitting, I now put my looping attachment into place in the same manner that the Tuttle ribber is brought into position. The cam-plate G is so firmly adjusted that the points F' are driven out as they approach the yarn-guides J and I. The points are so adjusted vertically that they will project out beneath the yarn in the guide J and above the yarn in the guide I. As the cylinder now turns farther around, the needles, in descending, operate as follows: They catch both yarns and draw them down, forming a stitch in the fabric. The projecting point F', however, holds back the yarn from the guide J and causes it to leave a loop of the said yarn hanging upon the said projecting point. Now, as the cylinder continues to revolve, the cam-groove G' operates to withdraw the points from the loops, thus freeing the loops.

K is an adjusting-screw, whereby the disk F may be adjusted in a vertical direction, and so regulate the lengths of the loops. It will be observed that in the disk F (shown in the drawings) there are only half the number of points that there are needles in the needle-cylinder, so that a loop will be produced only between every second needle and the succeeding one. This particular arrangement of the points F' is not, however, essential. It produces a fabric with loops which lie adjacent to each other, and constitute an unbroken interior line of loops; but the points F' may be made the same in number as the needles, so as to produce a loop between each needle and the adjacent one; or the points F' may be arranged in any desired order, so as to produce a series of loops opposite the corresponding spaces in the fabric. Thus by removing every alternate point F' the loops upon the interior would be double in their spaces apart from each other; or several points may be employed contiguous to each other, and then several points removed, and so a fabric would be provided with loops upon its interior corresponding with the points used. It is, however, seen that the loops can be arranged in any desired order upon the interior of the fabric to suit the taste of the operator.

I would have it understood that I do not limit myself to a flat disk, F, for it may be made conical, if desired. So, also, the points F' need not necessarily be located in radial slots, it being only necessary that the disk F be of any shape and the groove f have any desired direction to accomplish the proper support of the points F' and their proper operation in being forced out laterally to the needles to form the loops and withdrawn, so as to discharge the loops.

I would also have it understood that I do not limit myself to the employment of two yarns in starting the plain fabric, for I may

begin the knitting of the plain fabric with a single yarn fed through the guide I, and then when I desire to form the loops I may start a new yarn in the guide J. I can, moreover, after having knit a portion of the fabric with interior loops, discontinue the operation of the looping mechanism without removing the looper from the machine, by simply transferring the yarn from the guide J into the guide I, at any time resuming the looping operation by transferring the said yarn back to the guide J. So, also, having knitted a portion of the fabric with its interior loops, I can at any time break off the yarn which is fed through the guide J, and so continue to knit the fabric with a single yarn, and without loops through the guide I. Thus a variety of work can be made without any adjustment or change in the mechanism, and without removing or disturbing any of the needles or points.

I would also have it understood that I do not limit myself to any particular method of adjusting the disk F up and down. Any suitable means may be employed for this purpose, that shown in the drawings being the usual appliance for a similar vertical adjustment of the Tuttle ribber attachment.

By the foregoing mechanism it is apparent that the yarn which forms the loop is knitted in with the other end and constitutes a part of the body of the fabric, and that it will be knitted in regularly into the fabric through the whole spaces which intervene between one loop and the adjacent loop, whether it be a space corresponding with one stitch or a number of stitches, and hence the loop cannot be unraveled except by the usual process of unraveling the entire fabric.

The device here shown is represented as adapted only to the Tuttle ribber machine. It may, however, without change other than mechanical adaptation, be made to suit any other form of knitting-machine, there being required simply the adaptation of its several parts to suit the formation and construction of such other machines.

The cam-plate G is adjustably secured to its standard by a set-screw or equivalent, g. By adjusting this cam-plate about its standard as an axis the cam G' may be so located as to cause the points F' to advance and recede at the proper places with respect to the needles.

This lining of loops may be knitted into any ordinary knitted fabric, such, for instance, as leggings, socks, and other articles of wearing-apparel.

What I claim is—

1. The combination, with the needle-cylinder, needles, and cam-cylinder, and means for operating the same, of two yarn-guides, a series of points arranged laterally to the needles, means for supporting the points, and mechanism for projecting said points between said guides to engage with the yarn between said guides to hold the same while the needles draw down the yarn to form the stitch, whereby

a loop is formed and knitted in the fabric, substantially as described.

2. The combination, with the needle-cylinder, needles, cam-cylinder, means for operating the cam-cylinder, and means for feeding two ends of yarn to the needles, of a series of points arranged laterally to the needles, means for supporting said points, and mechanism for projecting the points between said yarn-feeding means to engage with one of the yarns and hold the same to form a loop, while the needle carries the other yarn to form the stitch, whereby a loop is formed and knitted in the fabric, substantially as described.

3. The combination, with the needle-cylinder, needles, cam-cylinder, means for operating said cam-cylinder, and means for feeding two yarns to the needles, of a series of points arranged laterally to the needles, and a cam actuating said points to cause them to engage with the yarn, and hold the same to form a loop, while the needle will carry the free yarn to form the stitch, the said cam also serving to withdraw the point from the loop on the completion of the stitch, substantially as described.

4. The combination, with the needle-cylinder, needles, cam-cylinder, and means for operating said cam-cylinder, of a series of points

arranged laterally to the needles, means for projecting said points to engage with the yarn to hold the same while the needles carry the free yarn to form the stitch, and after the formation of each stitch to withdraw the projected point to leave a loop, and means for adjusting said points to or from the needles to regulate the length of the loop, substantially as described.

5. The combination of the needle-cylinder, the needles, the cam-cylinder, the plate F, the series of points supported in grooves in said plate, the cam-plate G, the supporting-shaft, and means for adjusting said cam-plate about its supporting-shaft, substantially as described.

6. The combination of the rotary disk F, the points F', supported thereby, the cam-plate G, and mechanism whereby it is adapted to be secured to a knitting-machine, substantially as described.

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

EDWARD MURBY.

Witnesses:

CHAS. W. McCORKLE,
WILLIAM F. McCORKLE.