(Model.) 2 Sheets—Sheet 1.

S. M. LEVY.

KNIT FABRIC AND THE ART OF CONSTRUCTING THE SAME.

No. 280,750. Patented July 3, 1883.

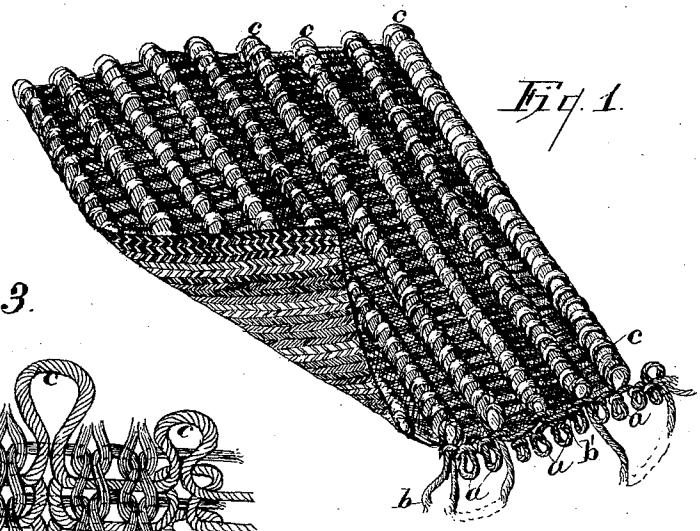


Fig. 1.

Fig. 3.

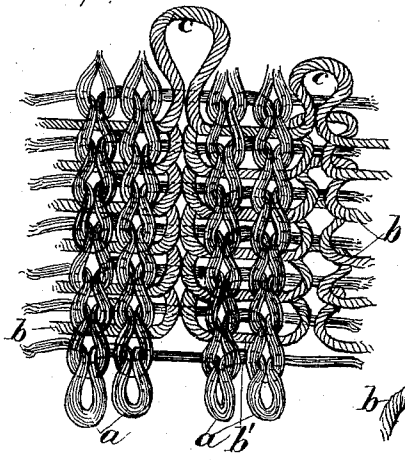




Fig. 2.

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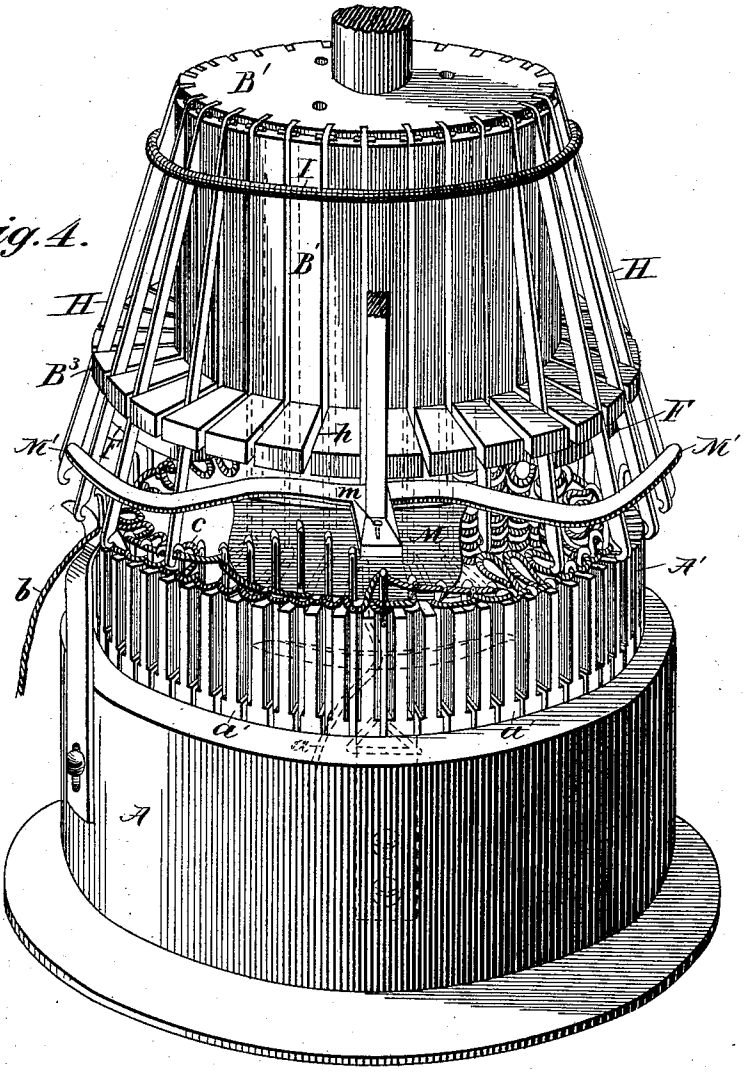
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Fig. 4.



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UNITED STATES PATENT OFFICE.

SALLY M. LEVY, OF MILWAUKEE, WISCONSIN.

KNIT FABRIC AND THE ART OF CONSTRUCTING THE SAME.

SPECIFICATION forming part of Letters Patent No. 280,750, dated July 3, 1883.

Application filed January 10, 1882. (Model.)

To all whom it may concern:

Be it known that I, SALLY M. LEVY, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Knit Fabrics and the Art of Constructing the Same; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention consists in an improved circular seamless knit fabric and the art of constructing the same, as will be more fully set forth hereinafter.

In the drawings, Figure 1 represents a portion of my improved fabric. Figs. 2 and 3 represent details of the same, drawn to an enlarged scale. Fig. 4 is a perspective view of the needle-cylinder and cam-shell and looping attachment of a knitting-machine (with gearing removed) upon which my fabric is adapted to be made, the said figure showing the position of the work upon the hooks and needles.

My fabric is constructed of two threads, one of which, *a*, forms the body of the goods in plain stocking-stitch, while on the reverse side the thread *b* is caught in between the stitches, leaving loops *c* between every two or more stitches, without being knitted into the main fabric, or in any sense integral therewith, yet being so held between the stitches that the said loops will remain in place unless the said thread *b* is pulled out, which would leave the main or knitted fabric intact, as clearly indicated by the detail view, Fig. 2. My said fabric is constructed in a circular seamless web upon a circular-knitting machine by the aid of a special attachment of my invention, which forms the subject of Patent No. 263,923, granted to me September 5, 1882, the application for which was executed on even date herewith, and which therefore need only be briefly described here. The machine used is preferably of the "Tuttle" pattern—that is, the cylinder which holds the needles revolves, while the cams remain stationary, as is clearly illustrated in the Tuttle patent, No. 149,813, dated April 14, 1874, and my looping attachment is suspended above the needle-cylinder, as shown in my patent just named, and also shown in Fig. 4 of the drawings. My looping attachment consists of a revolving cylinder, B′, provided with a number of downward-depending hooks, H, (held in place upon the outer periphery of said cylinder by a spring, I, so as to be capable of moving outwardly in grooves *h* in the flange B^3 at the base of the cylinder B′, coinciding with the vertical grooves in which the hooks H rest,) which hooks hold on their inner lower ends the thread *b;* and the said cylinder is also provided with a horizontal plate, F, with an inwardly and outwardly inclined cam-edge above and opposite the cams in the shell of the machine, and a vertical guide-plate, M, in front of this cam-plate, for forcing the thread *b* down below the latches of the needles as the hooks begin to travel inward against the cam-edge opposite the knitting-point. The vertical guide-plate M just named is suspended from an arm (in which it is vertically adjustable) attached to the knitting-machine, and the said plate projects down to a point just above the knitting-point, and between the cylinder B′ and the needle-cylinder A′, and behind the needles which form the stitches. Arms M′ are secured to this plate, and extend horizontally from behind it to the right and left, conforming in their shape to the shape of the cam-edge on the horizontal plate F, thus forming a passage-way for the hooks H behind the vertical guide-plate M. The said plate M, with its arms M′, is adjustable horizontally, as shown at *m*, by slot and set-screw, so as to determine the distance inward which the hooks H shall travel, and thus regulate the length of the loops *c*, (as well as adjustable vertically, as stated, so that if the needle-cylinder is moved up or down by means such as are shown in the Tuttle patent, already referred to, in order to knit the main fabric closer or looser, the plate M can always be adjusted directly above the knitting-point,) while, as before indicated, the function of the plate M itself is to force the extra or looping thread *b* down below the latches of the needles, (as they rise in their grooves *a′* by the action of the cams in the shell A,) and so keep the loops *c* from being actually knitted into the fabric. The effect of this is, that just before the needles

begin to knit with the thread *a* the thread *b* will be forced under their latches, and then as the stitch is completed the thread *b* will be first caught in between the stitches, and then this portion (*b'*) of said thread *b* will be pulled over the tops of the needles, (by the usual weights attached to the fabric,) together with the stocking-stitches of the thread *a*, just as the hooks which guide the thread *b* begin to emerge from the described cam-edge, leaving, as stated, a portion of said thread *b* caught in between every two or more stitches, according to the number of hooks used, (as shown in Figs. 2 and 3, where the thread *b* is caught in between every two stitches,) while the loops *c* are formed by means of the said thread *b* being pulled inwardly while it is upon the described hooks. As the hooks are forced outward by the horizontal cam-plate just as the stitches, &c., are pulled over the tops of the needles, the said hooks free themselves from the loops of the said threads *b*, leaving as the machine continues its revolutions series of these loops *c* regularly caught in in longitudinal rows between the longitudinal rows of stitches, as shown in Fig. 1. Of course, if fewer of these hooks are employed, these rows of loops will be farther apart, (as between every three or every four rows of stitches, for instance;) but this is controlled wholly by the number of hooks employed relative to the number of needles, and the consequent distance apart of these hooks. However, all these details of construction relate wholly to the machine which, as stated, forms the subject of the patent granted to me September 5, 1882.

The fabric, when completed, is a seamless circular web, one side of which is a plain stocking-stitch, while the other side has the described longitudinal rows of loops regularly caught in between the rows of stitches, but not knitted in throughout its entire length.

If two different colors of yarn are used for the two threads *a* and *b*, my fabric will be greatly enhanced in beauty and effectiveness, having then the appearance of striped goods, as indicated in Fig. 3, and, if desired, one thread may be of a different nature from the other—as, for instance, the plain stocking-stitch may be of cotton and the thread which forms the loops of wool, or either of the threads might be of silk, linen, or any material desired. In this way an infinite variety of appearance may be given to my improved fabric without in any sense departing from the spirit of my invention.

In addition to the ornamental appearance of my fabric thus constructed, the goods are of substantially double texture, and thus much warmer than even ribbed goods would be, as my loops substantially spread over the entire inner surface, while the outer side presents an unbroken surface, perfectly plain, of stocking-stitches.

My fabric is especially designed for the manufacture of seamless lined leggins, stockings, scarfs, cuffs, wristlets, hoods, and all other similar articles where a circular seamless lined web is desirable or applicable.

I am aware that a patent was granted to Dana Bickford on December 1, 1868, No. 84,473, for a looped knit fabric and the process of making the same, which consisted in knitting one or two, or more, rows of stitches upon a circular-knitting machine, and then, by hand, taking the same thread and running it back in and out between the needles in a zigzag form, holding with the other hand loops of the desired length, these loops of the yarn extending from the fingers back to the needles over which it has just been laid, and when this had been done the machine was then continuously revolved and another course of regularly-knitted stitches thereby formed directly over this zigzag layer of thread, whereby the same became interlaced with and bound by the stitches last made. I therefore wholly disclaim such process and the article made thereby, as the essence of my invention consists in knitting the main body of my fabric of one thread, and then automatically passing loops of another thread between the stitches of the first thread, but without uniting these loops to the stitches of the main fabric, whereas Bickford's loops are knitted in and inseparable from his main fabric, being, in fact, a part thereof and made with the same thread. With my process I can produce striped goods, the stripes being of different color from the main fabric, and the outside of my goods presents always the appearance of regular longitudinal rows of stitches where the looping-thread is interposed between the real stitches, both of which features readily distinguish my goods from those made by Bickford's process or any other known to me.

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

1. The method of knitting herein described, which consists in knitting a thread in regular stocking-stitches and passing at regular intervals loops of another thread between the stitches formed by the first thread, thus forming a double circular seamless fabric, the outer side of which is in plain stocking-stitch, while the inner side consists of longitudinal rows of loops and flat connecting portions formed of the second thread, held to the main fabric, as described, without being knitted into it, as set forth.

2. A circular seamless web or double fabric the body of which is made of one thread knitted in plain stocking-stitch, and having a lining consisting of longitudinal rows of loops and flat connecting portions formed of a second thread folded in at regular intervals between the stitches of the main fabric, substantially as set forth.

3. A circular seamless web or double fabric the body of which is made of one thread knitted in plain stocking-stitch, and having a lin-

ing consisting of longitudinal rows of loops and flat connecting portions formed of an independent thread, of preferably different color from the main fabric, folded in or passed between the stitches of the main fabric, and detachable therefrom, the outside of said web presenting the appearance of striped goods with longitudinal rows of plain stitches, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of January, 1882.

SALLY M. LEVY.

Witnesses:
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S. S. STOUT.