

D. BICKFORD.

Knit Fabrics and Methods of Knitting Them.

No. 136,639.

Patented March 11, 1873.

Fig. 2.

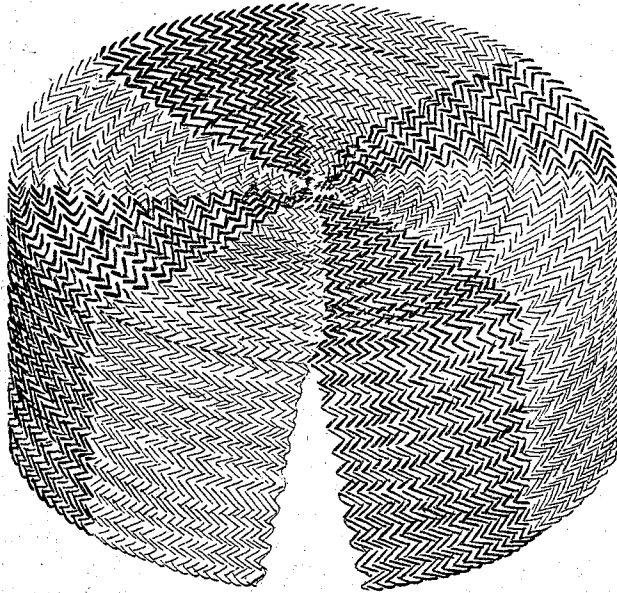
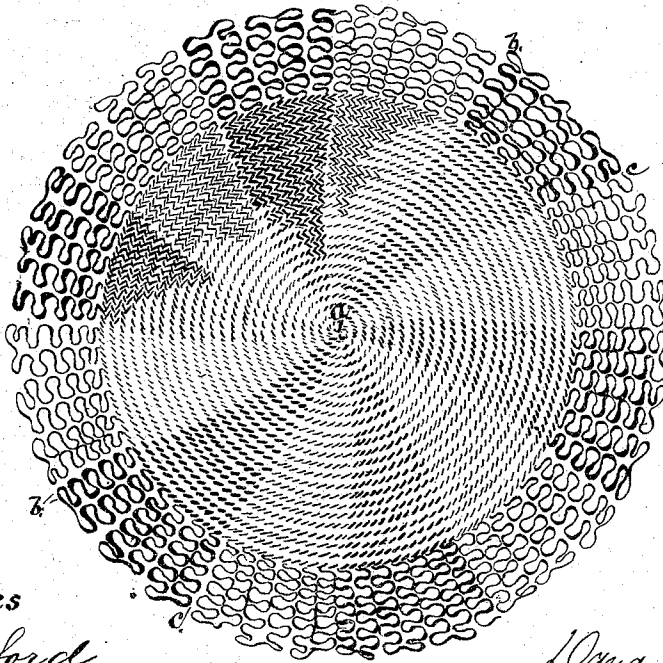


Fig. 1.



Witnesses

*W. Bradford
James Moulden*

Inventor

*Dana Bickford
by John J. Halsted
his atty.*

UNITED STATES PATENT OFFICE.

DANA BICKFORD, OF NEW YORK, N. Y.

IMPROVEMENT IN KNIT FABRICS AND METHODS OF KNITTING THEM.

Specification forming part of Letters Patent No. 136,639, dated March 11, 1873.

To all whom it may concern:

Be it known that I, DANA BICKFORD, of the city, county, and State of New York, have invented a novel process of knitting upon knitting-machines flat, circular, or square mats, hats, sacks, bags, &c., and a new article of mat or hat, &c., produced by such novel process; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention consists in a novel method of fabricating from a continuous yarn, upon a knitting-machine, flat circular goods, like a mat, and having a piece knitted simultaneously therewith, and from the same yarn, to form a cylindrical part, the whole, when complete, forming a tube with a flat bottom, suitable for a hat, cap, bag, or covering for any cylindrical body, and the part suitable for the cylindrical part forming, when raveled, a looped fringe around and integral with the flat central or mat portion; and my invention further consists in the novel products thus made.

In the drawing, Figure 1 represents a mat, and Fig. 2 a hat or cap (with its cylindrical part disconnected) made in accordance with my invention.

I employ in practicing my invention a circular machine of the class known as the Bickford machines, having a circular series of reciprocating needles working in parallel vertical grooves in the needle-cylinder, the machine having the capacity of being reversed or revolved in either direction to knit flat goods, as well as continuously in either direction to knit a tube; and any of the needles being capable of being quickly put out of action or removed when not wanted, and as readily put again into action.

I proceed as follows: I first set up the work upon the "set-up," but it is better to set it up on an old piece of knitting. Take as many needles as there are wanted stitches to reach from center to circumference, and enough more to include a fringe if wanted, or enough more for the height of the cylindrical part if a hat or bag is to be made. Knit, say, two rows all across to begin; then narrow at one side only (say at the left) by lifting two needles out of

action after every knitting forward and back, carrying the loop around such needles; continue this until all the needles employed for knitting one of the radial sections *abc*, shown in the drawing, are out of action; then push all the needles down. The needles thus temporarily put out of action may be held out of action in any proper manner, if not entirely removed from the machine; but for rapidity of work and greater facility of operation I prefer to use a needle having a notch or projection of such character that when the needle is lifted high enough to avoid its being actuated by the cams it will be held to such elevated position by the mere stress or tension of its loop, lodging in such notch or on or underneath such projection. For such improved needle I am now preparing an application for separate Letters Patent. After pulling up the last two needles, as above mentioned, care must be taken that the carrier be left on the right-hand side of the needles, and it must not be carried across until all the needles are put down; otherwise it would carry its yarn in a line back of all these elevated needles, and when the needles should be again put down they would throw off all their stitches. Now knit all across once, in order to throw off the loops, and thus carry them to the wrong side of the fabric. If another colored yarn is now preferred to be introduced, I remove the yarn from the carrier and introduce another color, tying the ends of the two yarns, and proceed precisely as before. Twelve such sections or gores complete the circle; unite the first and last gores (at radial lines) by hand sewing or by machine, and also unite the two ends of the portion not narrowed, and it becomes the tubular part of the hat, cap, or bag. This tubular part may be knit longer than needed for use, and then turned or doubled back upon itself as a sort of finishing band. If a rim be wanted, it may be made by widening out for that purpose. The hat or other article made as above described may have a tufted surface, the tufts being put in as in any tufted work done on my circular machines, using a "tufter" for this purpose. The tufting is done on all the needles except the edge ones or on such as may be desired. The top of the crown in this case may be made separate from the crown and then

united. If a mat is being made, the ends of the unwidened part are not to be united, this part being raveled to form fringe; but before this raveling I press the mat (moistened with a damp cloth over it) with a hot iron to set the crimp of the thread, and then ravel out at the circumference the portion not needed for the center; no portion will ravel but the unwidened part. A square mat or tidy is formed in substantially the same way as the circular one; but making four only instead of twelve sections, and narrowing less rapidly by drawing up four needles instead of two, and knitting one or twice between, and by calling into action more or less needles, as desired, in working to or from the corner of the square. A square-crowned hat or square-bottomed bag may also be made by the same method. To have twenty-four divisions or sections in the flat circular part, draw up four needles at a time. The less number of needles drawn up at a time the more obtuse will be the angles of each division. A separate fringe may be put on the mat instead of being knitted on, if desired, the mat in other respects being knitted as described.

My invention admits of knitting-disks of almost any desired diameter, connected with

tubes of any length desired, such articles being adapted as covers for small telescopes and other articles requiring protection.

The uses to which such bags may be applied are various, and their elasticity allows them to adapt themselves as covers to the forms of round and other shaped articles having varying diameters, and where woven covers could not well be adapted at all.

I claim—

1. The process herein described of knitting by machinery a flat circular mat.

2. The process herein described of knitting by machinery a flat, circular, or square piece or mat continuously with and integral with a portion to form with such piece the sides of a hat, sack, or bag.

3. The described machine-knitted mat or tidy, whether fringed or not, made as and by the process herein set forth.

4. The described machine-knitted hat, sack, or bag, made as and by the process herein set forth.

DANA BICKFORD.

Witnesses:

WILLIAM FITCH,
JARVIS MOULDEN.