(No Model.) 2 Sheets—Sheet 1.

W. M. BELL.

KNITTED FABRIC.

No. 599,438. Patented Feb. 22, 1898.

Fig. 3.

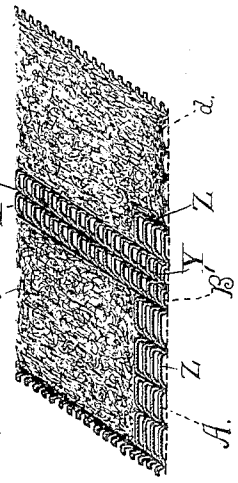


Fig. 2.

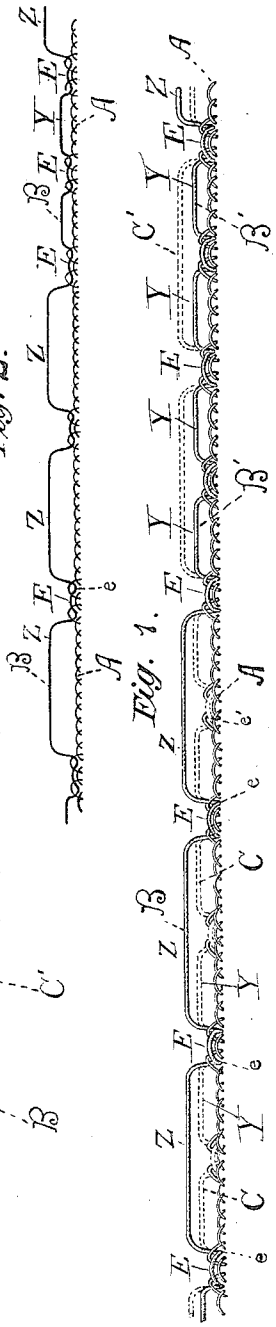
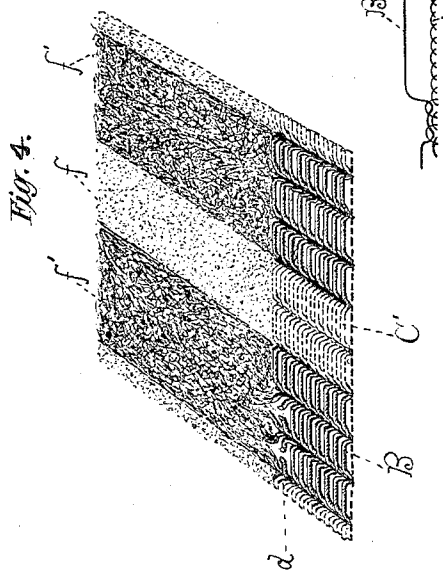


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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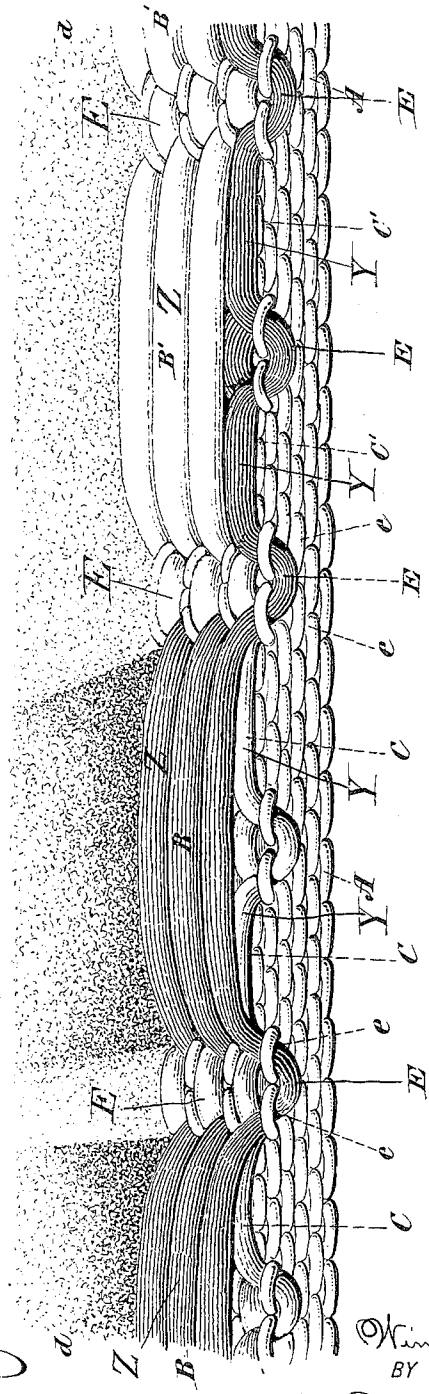


Fig. 5.

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UNITED STATES PATENT OFFICE.

WINSLOW MANLY BELL, OF NEW YORK, N. Y.

KNITTED FABRIC.

SPECIFICATION forming part of Letters Patent No. 599,438, dated February 22, 1898.

Application filed February 13, 1893. Serial No. 462,178. (No model.)

To all whom it may concern:

Be it known that I, WINSLOW MANLY BELL, a citizen of the United States, residing in the city, county, and State of New York, have invented a new and useful Improvement in Knitted Fabrics and the Methods of Producing the Same, of which the following is a specification.

My invention relates to improvements in knitted fabrics in which certain cords or threads, hereinafter designated "plush-threads," are so knitted into the body of the fabric as to form definite contrasts, figures, or designs, either in color, shape, relief, material, or all four, and allow of being suitably napped thereafter, if desired, without injury to the body fabric.

The invention is particularly adapted to fabrics knitted on circular-knitting machines.

The objects of my invention are, first, to produce a fabric with intermittent and recurring visible series or groups of pattern-loops, the loops of the same group being of substantially the same height or length and adjacent groups contrasting with each other in length of loops, color, shape, or material, or any one or more of such differentiations; second, to provide a new method for producing such a fabric. The machinery for producing a larger variety of patterns of this fabric than can be produced by the present plush-machines is the subject of an application filed by me on the 21st day of July, 1893, Serial No. 481,147, and is therefore not described in this application; but some patterns, such as straight and diagonal stripes, can be produced by a slight alteration in the arrangement of parts of the present plush-machines. I attain these objects in the following manner and as illustrated in the accompanying drawings, in which similar letters of reference refer to similar portions throughout the respective views.

Figures 1 and 2 are enlarged vertical sectional views showing the construction of the stitches and the relative positions of the threads in detail. Figs. 3 and 4 are perspective plan views of a fabric showing my invention. Fig. 5 is an enlarged perspective view of a portion of my fabric, showing the construction in detail.

My improved fabric differs from those previously used in having a plush-thread surface which consists of alternating groups or series of loops of said plush-threads, some of which loops are shorter than the others, such groups being arranged so as to be intermittently and recurrently visible and invisible, the relation of such groups to each other and the number of loops in each group being varied at pleasure, whereby various patterns or designs may be formed upon the surface, as desired. My new method of making such a fabric consists in interlacing plush-threads through loops of the binding-threads of said fabric and in so arranging the plush-threads that they will appear above the surface of the fabric in groups or series of loops, each group alternating with another group of a different height or length—for instance, one group Z composed of long high loops and a neighboring group Y composed of short low loops—and the groups being separated from each other by short loops of plush-threads tightly interlaced with the body fabric.

Referring to Fig. 1, A represents the binding-thread composing the foundation texture or body of the fabric—such as knit shirting or hosiery, for example—and which may be of any suitable material. Into this the plush-thread B, which may be of any suitable material and color, is interlaced or knit, as at *e*, in such a manner as to form a long loop raised considerably above the general surface of the fabric. These loops may be knit in series or groups of two or more, as may be desired. At E this plush-thread is interlaced or knit in such a manner as to form a short loop B′ raised only slightly above the body as compared with the long loop. These short loops may be also knit in series or groups. In this figure there is a group of three long high loops and one of four short loops of medium height and short loops E″ tightly interlaced with the body fabric and between each of the long or short loops. It will be seen that this method of knitting will permit of infinite varieties of design as regards the outline of the figure thus formed in relief by the difference in height of the respective loops or series of loops. At the same time, if desired, a second plush-thread C, which may be of different color or material, or both, may in the same way be interlaced or knit into the body A and

loops B B′, so as to form a similar series or group of short loops C under the long loops formed by plush-thread B, and in a similar manner several such threads may be knit so as to produce several series or groups of different colors and materials.

At E the plush-thread C is knit so as to in its turn come to the surface and form a long loop or series or group of loops C′ over the short loops B′ of the first plush-thread. In this case there will be no variety of relief, but a contrast of color or material will be attained, and the design resulting will depend upon the arrangement and dimensions of the respective group of loops. The long loops B and C′ may, if desired, now be napped, as shown at *d*, Figs. 3, 4, and 5, when the contrast of the respective plush-threads B and C′ will appear in the napped surface both in color, material, and design, as shown at *f f′*, Fig. 4.

Referring to Fig. 2, here but one plush-thread is shown, the contrast on the surface showing in the relief attained in the knitting of groups of long and high and short and medium height loops. In this case the long loops may be napped, if desired, leaving the short loops unnapped, as in Fig. 3 at *f′ g*, thus forming a contrast in relief.

Referring now to the machine which I prefer to use in carrying out the method of knitting my improved fabric, I employ a form of circular-knitting machine with which the plush-bur described and claimed by me in my said application, Serial No. 481,147, is employed, and first introduce the body-yarn into the needles in the regular way, and then (having adjusted the cam or cams on the pattern-wheel and knitting-cylinder of said machine so that a design consisting of plush-thread loops corresponding to that arrangement of cams is to be woven unto the body) I place the plush thread or threads into the segmental plush-bur shown in my aforesaid application and start the machine. Whenever I desire to change the position of the groups of loops or the arrangement of the short or long loops with relation to each other I correspondingly change the position of the cams upon the pattern-wheel and upon the knitting-cylinder. It is to devise my improved fabric that I have invented the mechanism and form of plush-bur shown and described in my aforesaid application, Serial No. 481,147, filed July 21, 1893, no other means or machine for producing my fabric having then been or now known to me.

I do not limit myself to any particular color or pattern or design of my improved fabric, nor to the number, size, grouping, or arrangement of the loops, nor to the feature of the relief of the different portions, nor, on the other hand, do I claim knit fabrics generally, or knit fabrics in different colors, or napped fabrics of different materials; but

What I claim, and desire to secure by Letters Patent, is—

1. A knit fabric having a body-thread and a plush-thread, said plush-thread engaging with the body-thread in groups of alternately short and long loops, the group of long loops lying higher than the group of short loops above the body portion of the fabric, substantially as described.

2. A fabric consisting of body-threads, and two or more plush-threads, said plush-threads engaging with the body-threads in alternately short and long loops, the long loops of one plush-thread lying over the short loops of the other plush-thread and vice versa, and all of said long loops lying higher than the short loops above the body portion of the fabric, substantially as described.

WINSLOW MANLY BELL.

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