

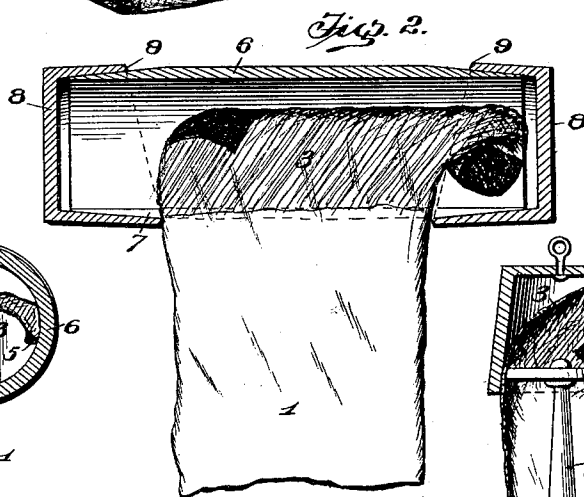
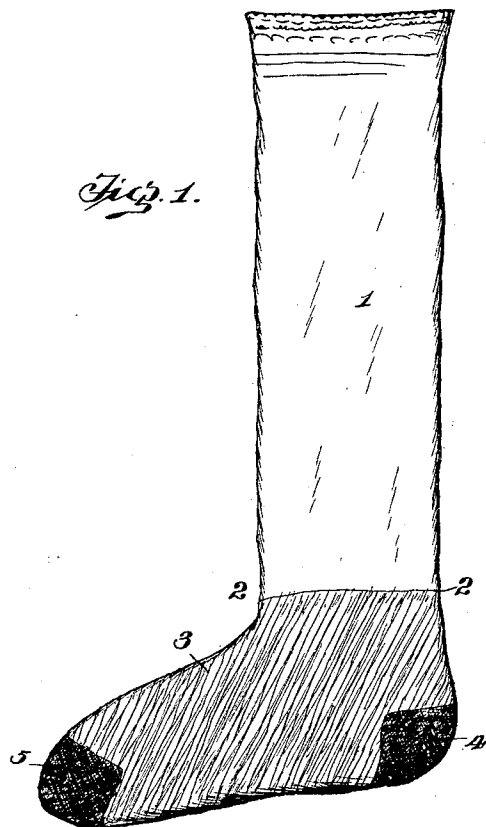
No. 686,957.

Patented Nov. 19, 1901.

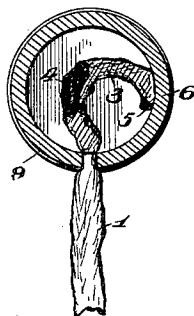
B. T. STEBER.  
PROCESS OF PRODUCING KNIT GOODS.

(Application filed Aug. 24, 1901.)

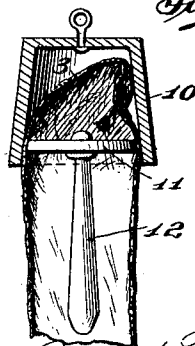
(No Model.)



*Fig. 3.*



*Fig. 4.*



Inventor

Witnesses

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# UNITED STATES PATENT OFFICE.

BERNARD T. STEBER, OF UTICA, NEW YORK.

## PROCESS OF PRODUCING KNIT GOODS.

SPECIFICATION forming part of Letters Patent No. 686,957, dated November 19, 1901.

Application filed August 24, 1901. Serial No. 73,174. (No specimens.)

*To all whom it may concern:*

Be it known that I, BERNARD T. STEBER, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Processes of Producing Knit Goods; and I do hereby 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 appertains to make and use the same.

My invention relates to improvements in the process of producing knit goods of a dark color or colors in which a portion of the same is first knitted with white or other light-colored material and then transferred to another machine and the remainder of the fabric knitted with materials of the color in which it is desired to have the completed article, after which the portion which was knit in light color is dyed to the dark shade which is desired for the finished article. This improvement is particularly well adapted for the producing of dark or black stockings or socks, which requires the changing of the article from one machine to the other during the process of knitting. This invention is calculated to facilitate the manufacture of bicolored hosiery, especially where the heel and toe are wholly or partially knitted in a different color from the foot portion. In knitting woolen stockings, for instance, it would be impossible to knit the stocking entirely of wool in white and dye afterward and yet have the heel and toe of different colors from the rest of the stocking unless my method were employed. There is also no way, so far as I am aware, of dyeing a stocking knitted entirely in white and having silk heel and toe portions after the stocking has been knitted and to have the heel and toe a proper contrasting color from the rest of the stocking. This has been done where cotton was used for the heel and toe portion; but as the same dye which will color wool in the foot will color it in the toe there are but two ways, so far as I am aware, to produce a black stocking, for instance, having red or blue or some other contrasting colored toes and heels made of wool or silk, one being to knit them from different-colored yarn at the heel and toe and from black yarn for the foot and leg, and the

other way is according to my invention, as hereinafter set forth.

The invention consists in the process of producing dark knit articles by knitting the main body portion of the fabric in white or light-colored material or yarn, after which the loops of the said material are transferred from the needles of one machine to the needles of another machine for producing a different stitch, the remainder of the fabric being knitted in a color or colors in which it is desired to have the completed article and then inclosing the portion which is knit in the final color in a suitable protecting-receptacle and dyeing the portion outside the same which was knit in white or light color.

It also consists in certain other features and variations of the said process, as will be hereinafter fully described and claimed in the specification and claims.

In the accompanying drawings, forming a part of this application, Figure 1 is a side elevation of a sock or stocking knitted by my improved process. Fig. 2 is a longitudinal central section through a receptacle for inclosing a portion of the stocking when dyeing the remainder thereof. Fig. 3 is a transverse cross-section through the same. Fig. 4 is a detail sectional view of a modified form of receptacle for accomplishing the same purpose as the receptacle shown in Figs. 2 and 3.

In knitting certain dark fabrics, particularly in producing socks and stockings which are colored with dark colors or are made of black material, and especially where the stitch in such fabrics has to be changed, so that it is necessary to remove the article from the needles of one knitting-machine to those of another, this changing process is a very difficult and trying one when the yarn used is black or some dark color. The loops of the knitted fabric in an ordinary sock or stocking are very small and close together, and it is not an easy matter to transfer them from the needles of one machine to those of another. I find that in knitting such goods the eyes of those who perform the changing operation just mentioned are considerably affected and often seriously injured in a short space of time, and in addition to this it requires considerable time to effect such change when using dark yarn. I have therefore invented

a new and useful process for producing such goods, whereby the changing of the article from one machine to the other can be done much more quickly than before and without undue strain upon the eyes of the operators and also in such a manner that the article when completed will be of the color or shade desired.

While I could produce various knit goods by my improved process, yet I find it particularly advantageous in the production of socks or stockings, and will therefore describe my process in connection with the formation of socks or stockings, having illustrated such process in the accompanying drawings.

In Fig. 1 of the drawings will be seen a stocking the leg portion 1 of which I knit in light-colored yarn, preferably white, knitting the said leg to a point about opposite the ankle—say to about the line 2 2. The leg is preferably in some suitable stitch—say, for instance, in a stitch having ribs formed on the inner and outer surfaces of the stocking—and when the line 2 2 is reached the leg portion is removed from the machine, its loops being shifted from the needles of the first machine to the needles of another machine, in which a stitch suitable for the foot portion of the stocking can be produced. A plain stitch is usually employed for the foot portion of the stocking, and in knitting the foot a machine having a less number of needles than was employed by the machine used in knitting the leg is used, some of the loops being doubled upon some of the needles of the second machine. In knitting the foot portion of the stocking 3 I use a yarn of the color in which it is desired to have the completed article—say black or some other dark shade—and may also knit the heel and toe portions 4 and 5, respectively, of colors different from the foot portion—say with red or blue silk. The heel and toe portions may of course be knitted black, as the remainder of the foot portion; but it is for stockings where heel and toe tips of a different color are required that my invention is found most advantageous. After thus knitting the stocking I preferably wet it and then inclose the foot portion with the heel and toe in a suitable receptacle or tight closure, the projecting leg portion of the stocking, which was originally knit in white, being then immersed in a suitable dye, preferably of the same color as the foot of the stocking, the said stocking being thus completed in the color desired. The foot, either with plain or fancy toe and heel, is thus entirely protected from the dye, and after the leg portion has been dyed the stocking can be removed from the closure or receptacle, when it will appear as if it had been knitted throughout with one colored yarn.

While I may use a variety of receptacles or closures for holding the foot of the stocking and prevent the same from being brought into contact with the dye used in coloring the leg of the stocking, I contemplate employing

a device like that shown in Figs. 2 and 3 of the drawings for this purpose. Such device consists of a cylindrical body portion 6, split along one side, as at 7, and open at its ends. The split tube 6 is beveled back from its edges, as at 7, from each end thereof, the beveled ends thus formed being adapted to be closed by caps 8 8. The caps are formed with a correspondingly-beveled inner surface to fit upon the bevels of the ends of the split tube, so that when the caps are forced upon the ends of the said tube they will crowd the split portion thereof together. It will thus be seen that by inserting the foot portion of the stocking in the slit 7 of the receptacle 6 and forcing the caps 8 upon the ends thereof the stocking can be very tightly squeezed at the ankle, so that the dye into which the leg of the stocking is immersed cannot enter the receptacle 6 and come in contact with the foot portion of the stocking. The caps 8 are formed with beveled edges or edges cut upon an incline, as shown at 9, so that by turning the caps upon the ends of the receptacle the length of the slit 7 can be varied to accommodate the width of the particular stocking which is being dyed. In Fig. 4 a receptacle of a little different shape is illustrated for accomplishing this purpose. It consists in a bell-shaped receptacle or casing 10, open at its large end to receive the foot of the stocking. A disk or plunger 11, carried by a handle 12, is inserted within the leg of the stocking and is forced into the mouth of the receptacle 10, so as to wedge against the sides thereof and make a tight joint at this point. After the foot portion of the stocking has thus been secured in place within the receptacle the light portion may be dipped into a dye for finishing the stocking in the desired form. It will be apparent that I may employ other receptacles of a similar character for accomplishing the same result without altering or changing the process.

In making a stocking having ankle portions which are short, and consequently have their bright-colored heel-tips quite near to the dyeing liquor, I have found that in order to prevent the tips from becoming discolored so great a pressure is required on the fabric between the members of the holders that the fabric being dyed is injured. The capillary attraction of the dry foot and ankle portions of the stocking is so absorbent as to draw some of the dyeing liquid between the clamping-surfaces of the holder, and thus discolor the toe or heel portion of the stocking. To obviate this difficulty, I dip the entire foot portion into water, oil, or other liquid before beginning to dye the leg portion of the stocking, and thus so fill the pores and empty spaces of the foot portion of the fabric that the color-dyeing liquid is prevented from entering the holder.

I have found by actual experiment in producing stockings in this manner that the operators who do the work can change the loops of a white yarn from the needles of one ma-

chine to the needles of another much more quickly than where a dark or black yarn is used and also that the eyes of the operators are saved by this process and protected from injury.

The stockings after rinsing are removed from their clamps and drawn over suitably-shaped forming-boards and dried thereon to give them a uniform appearance.

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

1. The herein-described process of producing fabrics in dark colors, consisting in knitting a portion of the fabric in a white or light-colored yarn, then changing the fabric from the needles of one machine to the needles of another, and completing the fabric in yarn of the final colors desired, incasing the latter 20 portion of the fabric in a liquid-excluding receptacle, and immersing the portion of the fabric which was knitted in the white or light-colored yarn in a dye of the color in which it is desired to have that portion of the fabric 25 finished.

2. The herein-described process of knitting stockings of a dark or black shade, consisting in knitting the leg portion thereof in white or light-colored yarns, and then transferring the 30 same to the needles of a machine for footing the stocking, knitting the foot portion of the stocking in the final colors desired, inclosing the foot portion of the stocking in a suitable liquid-excluding receptacle, and finally immersing the leg portion in a dye for giving 35 the same its final color without injuring the color of the foot portion.

3. The herein-described process for producing stockings of a dark color, consisting in 40 knitting the leg portion thereof with white or light yarn in one machine, transferring the

same to a footing-machine and knitting the foot portion with one or more colors and materials, the said foot, toe and heel being of the final color desired, inclosing the foot portion 45 in a liquid-excluding casing so that the leg of the stocking may be immersed in a dye for giving it its final color, immersing the leg portion in a dye for giving it its final color, the inclosing of the foot portion preventing 50 the foot, toe and heel from being affected by the said dye.

4. The herein-described process for producing stockings of dark colors, consisting in knitting the leg portion of a light color, transferring the same to a footing-machine in which the foot portion is knitted in the final dark color or various colors desired, treating the foot portion with a substance to fill the vacant spaces or pores of the fabric, inclosing 60 the foot portion in a suitable liquid-inclosing receptacle, and finally dipping the leg portion in a suitable dye for producing the final shade desired.

5. The herein-described process for producing 65 stockings of dark colors, consisting in knitting the leg portion of a light color, changing the same to a footing-machine in which the foot portion is knitted in the final dark color or various colors desired, dipping the 70 foot portion in water to fill the vacant spaces or pores of the fabric, placing the foot portion in a suitable liquid-excluding receptacle, and finally dipping the leg portion in a suitable dye for producing the final shade desired. 75

In testimony whereof I hereunto affix my signature in presence of two witnesses.

BERNARD T. STEBER.

Witnesses:

G. W. REYNOLDS,  
FRANK STEBER.