J. W. METTLER & W. E. SMITH.

SEAMLESS HOSIERY AND PROCESS OF KNITTING THE SAME.

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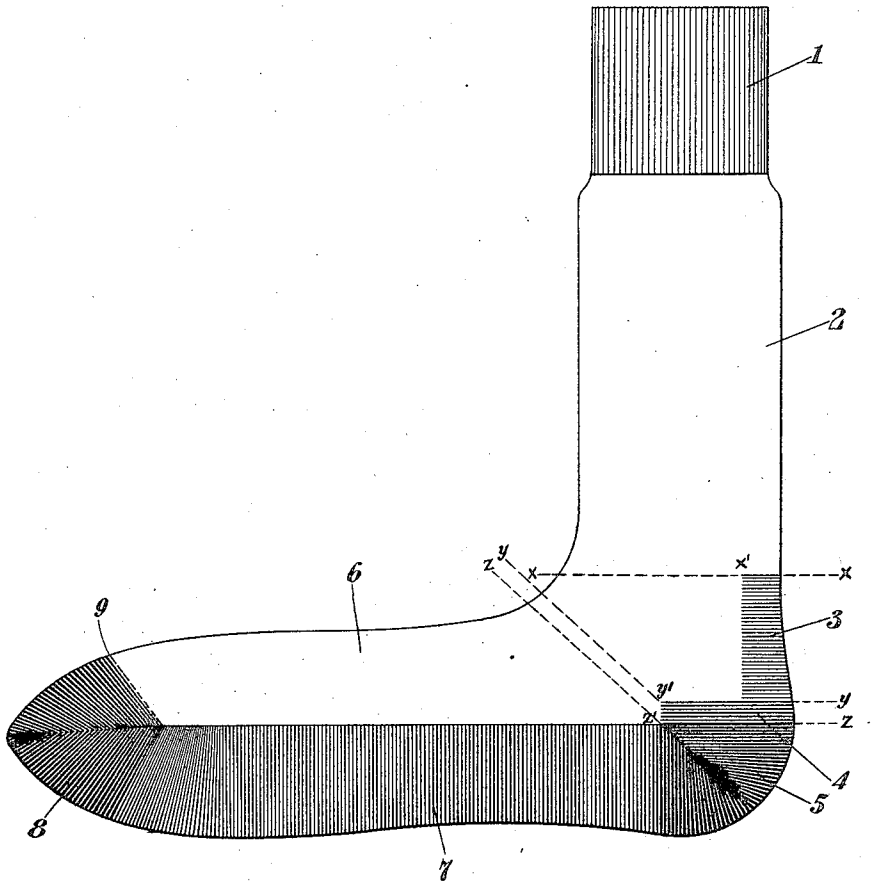
1,169,416. Patented Jan. 25, 1916.



Witnes..
John E. Prager.
A. Worden Gibbs

John Wyckoff Mettler and
William E. Smith Inventors
By their Attorneys
Mitchell & Peacock.

UNITED STATES PATENT OFFICE.

JOHN WYCKOFF METTLER, OF EAST MILLSTONE, AND WILLIAM E. SMITH, OF MILLTOWN, NEW JERSEY, ASSIGNORS TO KILBOURN MANUFACTURING CORPORATION, OF NEW BRUNSWICK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SEAMLESS HOSIERY AND PROCESS OF KNITTING THE SAME.

1,169,416. Specification of Letters Patent. Patented Jan. 25, 1916.

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To all whom it may concern:

Be it known that we, JOHN WYCKOFF METTLER, a citizen of the United States, residing at East Millstone, in the county of Somerset and State of New Jersey, and WILLIAM E. SMITH, a citizen of the United States, residing at Milltown, in the county of Middlesex and State aforesaid, have invented new and useful Improvements in Seamless Hosiery and Processes of Knitting the Same; and we 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.

Our invention consists in the novel features hereinafter described, reference being had to the accompanying drawing which illustrates, diagrammatically, a side elevation of a man's half hose embodying the preferred form of our invention, which we have selected for the purposes of illustration, and the said invention is fully disclosed in the following description and claims.

In the manufacture of seamless hosiery, the requirements of the trade have been for stockings, the leg and top of the foot of which are of increasingly fine or thin and transparent fabric, especially in the higher grades which are made from very fine cotton, lisle, or silk, in order that the stockings may be worn with low shoes, pumps, and slippers. In order that such fine fabric stockings shall have the required wearing qualities, it is customary to knit the heel, bottom of the foot, sole, and toe of heavier fabric and in order to prevent the upper edge of the counter of a low shoe, pump, or slipper from wearing through the fabric of the leg above the heel, it has been customary to reinforce that portion of the back of the leg above the heel, or in other words, to knit such portion of heavier fabric, such portion being termed for convenience of reference, no matter how it is made, the high splice. In knitting the portion of the leg containing the high splice, it has been customary to have it extend around the back of the leg and forwardly on the sides of the ankle portion so that it forms about one half of the leg portion above the heel, or in other words, each course of the heavier high splice portion contains practically the same number of stitches as the first course of the heel. It is also necessary in most stockings to carry the high splice portion a considerable distance above the heel with the result that the heavier high splice portion, which contrasts materially in color tone with the extremely fine and transparent fabric of the rest of the leg and top of the foot, presents an ugly rectangular portion of darker hue at both sides of the ankle, which is very unsightly.

The object of our invention is to provide a seamless stocking with a high splice portion very much narrower than the heel and confined to a plurality of courses at the back of the leg, each containing a considerably less number of stitches than the first course of the heel, and preferably considerably less than half the number of stitches of the first course of the heel, or approximately the number of stitches in the narrowest course of the heel, so that while the high splice will be wide enough to afford protection at the extreme back of the leg, from the top of the counter of a low shoe or slipper with which it is worn, it shall not extend on the sides of the stocking toward the ankle joint and will be practically invisible when the stocking is worn even with a low shoe or pump.

In the preferred embodiment of our invention, we also provide a plurality of courses of heavier fabric between the narrow high splice portion and the first course of the heel, containing reinforced stitches corresponding in number and location substantially with the first course of the heel, which portion we term, for convenience of reference, the auxiliary high splice. This auxiliary high splice, therefore, extends around on the sides of the stocking as far as the first course of the heel, but being a narrow portion vertically, located immediately above the heel, it will not be perceptible to any material extent above the counter of a low shoe, while it performs two useful functions. In the first place, it provides the portion of the leg of the stocking to which the heel pocket is knit with an edge of heavier fabric than the leg to which the still heavier heel pocket may be knit with less danger of straining or breaking the stitches of the leg portion adjacent to the

first course of the heel than would be the case if the extremely heavy heel were knit directly upon the fine tight knit fabric of the leg, and secondly, it provides a horizontal strip of heavier fabric than the leg at a point corresponding to the lateral portions of the upper edge of the shoe counter which tends to increase the wear of the stocking at that point.

We also prefer to knit the high splice and auxiliary high splice by throwing in a reinforcing thread in addition to the fine main knitting thread which forms the courses of the leg and top of the foot, although these heavier portions might be formed by separate heavier threads if found desirable. We also prefer to use a reinforcing thread in the auxiliary high splice of a different material from that used in the main or narrow high splice, and in the preferred embodiment of our invention, we prefer to use a reinforcing thread in the narrow high splice of the same material as the main knitting thread in the leg and top of the foot, while in the auxiliary high splice, we use a reinforcing thread of the same material as that used in knitting the sole or heel, which will be a different material ordinarily from that used in the leg and top of the foot, especially in the case of lisle and silk, and other high grade stockings.

Referring to the accompanying drawing, which as before stated, represents diagrammatically a stocking embodying our invention, 1 represents the usual ribbed top, 2 the leg portion of the stocking, 3 the narrow high splice, 4 the auxiliary high splice, 5 the heel pocket, 6 the top portion of the foot, 7 the sole portion of the foot, and 8 the toe pocket, which is united to the top portion of the foot by the usual toe joining, indicated at 9.

In knitting this stocking after the ribbed top is placed on the needles of a circular knitting machine, the leg portion 2 is knit by circular knitting with the main knitting thread down to the dotted line x—x in the usual manner with the fine main knitting thread and tight stitch to produce a fine transparent fabric. The main knitting thread may be cotton, lisle, or silk as preferred. In knitting the courses between the dotted line x—x and the dotted line y—y, a reinforcing thread is preferably fed to a few needles only at the back of the stocking extending from the point x', in the figure around to a corresponding point on the other side of the stocking, in each successive course, thereby producing the narrow high splice 3. When the course indicated by y—y is reached, a reinforcing thread is fed to a much larger number of needles extending from the point y' to the corresponding point on the other side of the stocking and immediately above the point of the heel, which is indicated at z', and in knitting the courses between the dotted lines y—y and z—z, the auxiliary high splice 4 is produced. When the course indicated by the dotted line z—z is reached, the heel pocket 5 is knit onto that portion of the course z—z indicated from the point z' to a point corresponding thereto on the other side of the stocking, in the usual manner by narrowing and widening. The top of the foot 6 and sole of the foot 7 are then knit by either circular or split foot work and the sole 7 is preferably knit as a heavier fabric, after which the toe pocket 8 is knit in the usual manner.

In knitting a silk stocking, we prefer to use a reinforcing thread of silk in the narrow high splice 3 and to use a reinforcing thread of a different character in the auxiliary high splice, which is preferably slightly heavier than the reinforcing thread in the narrow high splice, as for example artificial silk or cotton. It is particularly advantageous to use cotton in the auxiliary high splice, as it blends directly into the heel pocket, which is usually knit of cotton, and which is a heavier fabric than the auxiliary high splice.

A stocking constructed and knit as herein described possesses a number of special advantages, as portions of the ordinary high splice which extend onto the ankle joint and are particularly unsightly, are entirely omitted without detriment to the wearing qualities of the stocking, the high splice is confined to a comparatively small number of stitches at the back of the stocking, while the auxiliary high splice serves to connect the narrow high splice and the fine knit leg portion forward thereof, with the heavy fabric of the heel in such a manner as to effect a smooth union and provide for the greatest wearing capacity between the leg of the stocking and heel.

What we claim and desire to secure by Letters Patent is:—

1. A seamless circular knit stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a narrow vertically disposed reinforced portion comprising a plurality of consecutive courses, all the reinforced stitches in each course being knit with a continuous thread, and being restricted to a small number of stitches at the extreme rear portion of the leg, less than half the number of stitches in the first course of the heel, whereby the high spliced portion protects the extreme back of the stocking leg, but does not show materially at either side of the stocking when worn with low shoes.

2. A seamless circular knit stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a narrow vertically disposed rein-

forced portion comprising a plurality of consecutive courses, all the reinforced stitches in each course being knit with a continuous thread, and being restricted to a small number of stitches at the extreme rear portion of the leg, less than half the number of stitches in the first course of the heel, the back of the leg of the stocking having an auxiliary reinforced portion between said narrow high spliced portion and the heel comprising a small number of courses containing substantially the same number of reinforced stitches as the number of stitches in the first course of the heel, and the heel having its first course knit into the last course of said auxiliary high spliced portion, whereby a narrow high spliced portion is provided to protect the back only of the stocking without showing materially at the sides thereof, and whereby a heavier fabric is provided in the leg below said narrow high splice in a position where it is not materially visible, to which the heel is united.

3. A seamless stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a reinforced portion comprising a plurality of courses, the reinforced stitches in each course being considerably less in number than the first course of the heel, to form a narrow high spliced portion, extending only a short distance around the sides of the ankle portion, the back of the leg of the stocking having an auxiliary reinforced portion between the said narrow high spliced portion and the heel comprising a plurality of courses, the reinforced stitches of which correspond substantially in number and location with the first course of the heel, said auxiliary high spliced portion being reinforced with a thread of different material from that used to reinforce the narrow high spliced portion, and the heel being formed by narrowing and widening and being a heavier fabric than the leg portion, whereby the auxiliary high spliced portion provides a heavier fabric at the rear of the leg of the stocking immediately above the heel to which the heel is united.

4. A seamless stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a reinforced portion comprising a plurality of courses, the reinforced stitches in each course being considerably less in number than the first course of the heel, to form a narrow high spliced portion, extending only a short distance around the sides of the ankle portion, the back of the leg of the stocking having an auxiliary reinforced portion between the said narrow high spliced portion and the heel comprising a plurality of courses, the reinforced stitches of which correspond substantially in number and location with the first course of the heel, said auxiliary high spliced portion being reinforced with a thread of the same material as that used in knitting the heel, and the heel being formed by narrowing and widening and being a heavier fabric than the leg portion, whereby the auxiliary high spliced portion provides a heavier fabric at the rear of the leg of the stocking immediately above the heel to which the heel is united.

5. A seamless stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a reinforced portion comprising a plurality of courses, the reinforced stitches in each course being considerably less in number than the first course of the heel, to form a narrow high spliced portion, extending only a short distance around the sides of the ankle portion, the back of the leg of the stocking having an auxiliary reinforced portion between the said narrow high spliced portion and the heel comprising a plurality of courses, the reinforced stitches of which correspond substantially in number and location with the first course of the heel, said narrow high spliced portion being reinforced with a thread of one material and the auxiliary high spliced portion being reinforced with a thread of a different material, and the heel being formed by narrowing and widening and being a heavier fabric than the leg portion, whereby the auxiliary high spliced portion provides a heavier fabric at the rear of the leg of the stocking immediately above the heel to which the heel is united.

6. A seamless stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a reinforced portion comprising a plurality of courses, the reinforced stitches in each course being considerably less in number than the first course of the heel, to form a narrow high spliced portion, extending only a short distance around the sides of the ankle portion, the back of the leg of the stocking having an auxiliary reinforced portion between the said narrow high spliced portion and the heel comprising a plurality of courses, the reinforced stitches of which correspond substantially in number and location with the first course of the heel, said narrow high spliced portion being reinforced with a thread of the same material as the main knitting thread of the leg portion, and the auxiliary high spliced portion being reinforced with a thread of a different material, and the heel being formed by narrowing and widening and being a heavier fabric than the leg portion, whereby the auxiliary high spliced portion provides a

heavier fabric at the rear of the leg of the stocking immediately above the heel to which the heel is united.

7. A seamless stocking having the leg and top of the foot knit with a fine thread and tight stitch as a fine fabric, the rear portion of the leg above the heel having a reinforced portion comprising a plurality of courses, the reinforced stitches in each course being considerably less in number than the first course of the heel, to form a narrow high spliced portion, extending only a short distance around the sides of the ankle portion, the back of the leg of the stocking having an auxiliary reinforced portion between the said narrow high spliced portion and the heel comprising a plurality of courses, the reinforced stitches of which correspond substantially in number and location with the first course of the heel, said narrow high spliced portion being reinforced by a thread of the same material as the main knitting thread of the leg portion and the auxiliary high spliced portion being reinforced with a thread of different material from that used in the leg and of the same material as the thread used in knitting the heel, and the heel being formed by narrowing and widening and being a heavier fabric than the leg portion, whereby the auxiliary high spliced portion provides a heavier fabric at the rear of the leg of the stocking immediately above the heel to which the heel is united.

8. The herein described process of knitting a seamless hose, which consists in knitting the leg portion down to the heel by circular knitting with a main knitting thread, introducing a reinforcing thread into a few stitches only, less in number than half the stitches in the first course of the heel, in a series of consecutive courses above the heel, said reinforced stitches being located at the extreme back of the leg, then knitting the heel by reciprocating work and narrowing and widening, and then knitting the foot portion and toe pocket, the reinforcing thread and main knitting thread extending continuously through all the stitches of each course of said reinforced portion.

9. The herein described process of knitting a seamless hose, which consists in knitting the leg portion down to the heel by circular knitting with a main knitting thread, introducing a reinforcing thread into a few stitches only, less in number than half the stitches in the first course of the heel, in a series of consecutive courses above the heel, said reinforced stitches being located at the extreme back of the leg, then introducing a reinforcing thread into a few courses substantially co-extensive with and located immediately above the heel, then knitting the heel by narrowing and widening on to the last of said co-extensive reinforced courses, then knitting the foot portion of the stocking, and the toe pocket, the reinforcing thread and main knitting thread extending continuously through all the stitches of each course of said reinforced portions.

In testimony whereof, we affix our signatures, in the presence of two witnesses.

JOHN WYCKOFF METTLER.
WILLIAM E. SMITH.

Witnesses:
CLIFFORD S. VANWINKLE,
FRED M. THICKSTUN.