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P. ADLER

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KNITTED ARTICLE AND METHOD OF PRODUCING SAME

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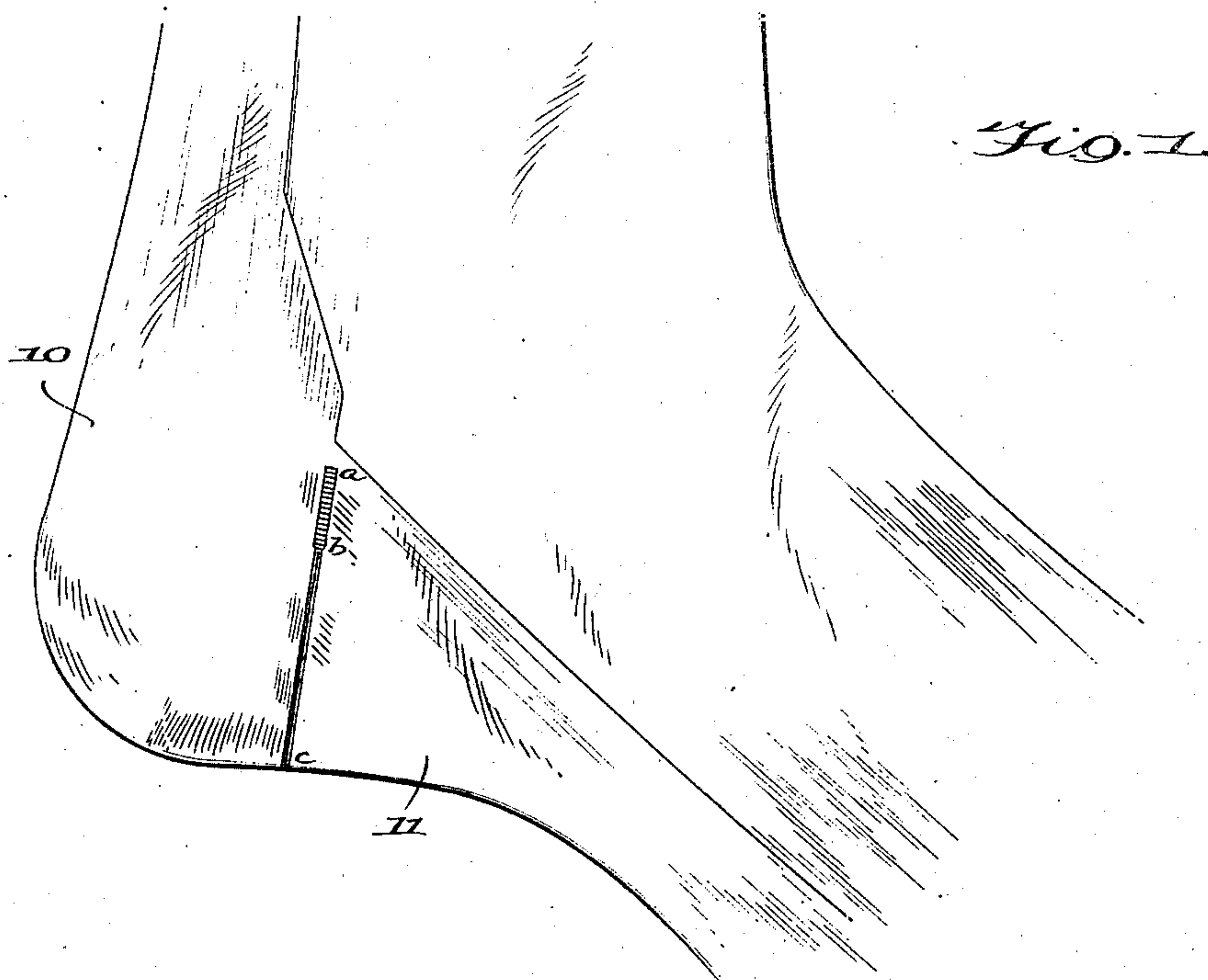


Fig. 2.

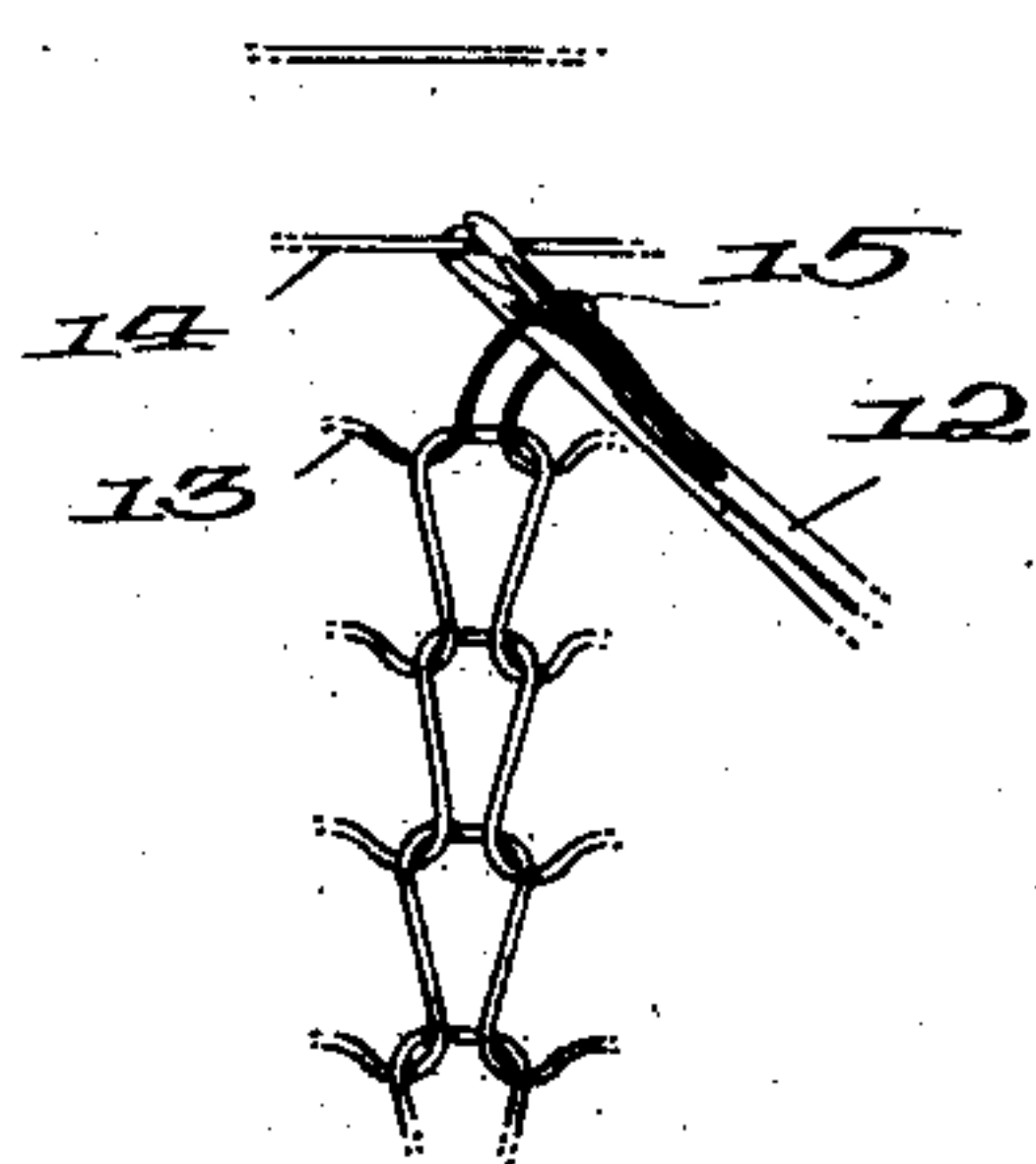
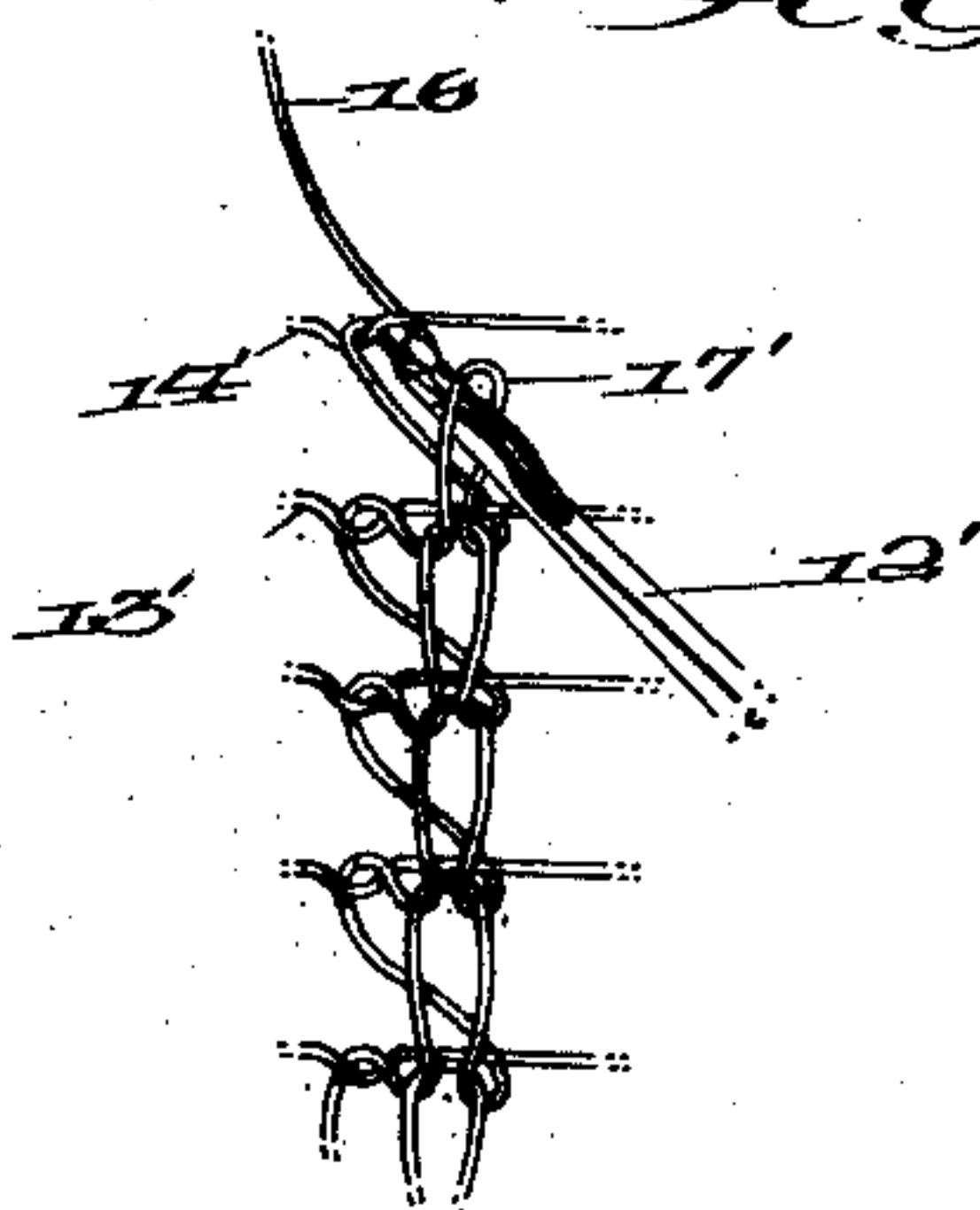


Fig. 3.



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## UNITED STATES PATENT OFFICE

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KNITTED ARTICLE AND METHOD OF  
PRODUCING SAME

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direct and mesne assignments, of one-half to  
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corporation of New Jersey, and one-half to  
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8 Claims. (Cl. 66—185)

In the manufacture of various knitted garments it is sometimes found necessary to resort to practices which produce a definite line of openings in the knitted fabric which detract from the appearance of the finished garments and are a source of weakness. As is well known, the practice of widening is employed when it is desired to increase the width of a garment in designated areas. Such operation takes place during the course of knitting and involves the transfer of groups of loops in recurrent courses outwardly and results in an opening or space in each transfer course where no knitted loop is present. Such openings, or fashioning marks, collectively define an open line in the fabric constituting the boundary between the widened and unwidened portions thereof and produce a ladder-like effect which is objectionable and has the general appearance of a "run" such as may occur along a wale upon a break in the thread.

The primary purpose of the present invention is to obliterate lines of openings such as produced by the practice of widening as just described with a view of overcoming the objections referred to. I carry out my general purpose in such manner that when the garment is completed it is practically impossible to distinguish the areas of the openings from the adjoining knitted portions of the fabric.

While the invention may be employed in other connections, it is particularly applicable to stockings of the so-called "single unit" type wherein the heel portion and adjoining part of the foot portion are formed integrally with continuous knitted courses. In such articles the heel pocket is formed during the course of knitting by widening the fabric for the full width thereof which is to be allotted to the heel, and a ladder-like line of openings, or fashioning marks, is presented on each side of the stocking which define the boundary between the heel and the foot portion. In accordance with my invention such openings will be closed up as now to be described and illustrated in the accompanying drawing wherein:

Fig. 1 is a more or less diagrammatic view of the heel and foot portions of a full fashioned stocking of the single unit type, and illustrating the line of fashioning marks at an intermediate stage in the practice of the present invention, the fashioning marks being in part open as conventionally and in their lower extent closed up;

Fig. 2 is a fragmentary view greatly enlarged showing one manner in which my invention may be practiced; and,

Fig. 3 is a view similar to Fig. 2 showing a further manner of practicing my invention.

In the stocking illustrated the heel portion is designated as 10 and the adjoining portion of the foot as 11, such parts being formed with continuous courses, but the heel being widened during the course of knitting with the resulting line of openings along the line *a—c* having the general appearance and character indicated between the points *a* and *b*. The cross lines between these two points represent the unconnected, or unknit, portions of the successive courses which traverse the heel portion and the adjoining part of the foot portion. Such openings are characteristic of the practice of widening, it being noted further that the wales in the heel portion run vertically and parallel to the openings along the line *a—c* while the wales in the foot portion run at an angle to such line. No attempt is made in the drawing to illustrate the wales of such parts in detail, but their general direction is indicated by the light parallel lines in various parts of the two areas. While the drawing merely indicates a fragmentary part of a full fashioned stocking, it will be understood that the same is made in accordance with the usual full fashioned practice under which the welt, leg, heel and foot portions are knit in a continuous operation.

In closing up a line of openings such as illustrated in the stocking of Fig. 1 I form a chain of interconnecting loops along the boundary between the two portions which I find completely obliterates any sign of fashioning marks in such area. Such chain of loops when completed has the general appearance of an additional knitted wale interposing between the foot and heel portions and blending in with the adjoining wales of the heel portion in such manner as not to be distinguishable therefrom. In Fig. 1 I have indicated the line of fashioning marks as closed between the points *b* and *c*, the portion of the line between *a* and *b* being unclosed merely to enable a clearer understanding of the nature of the invention. The complete application of my invention to the stocking is preferred to close the whole line of openings between the points *a* and *c*.

The chain of stitches for closing the fashioning marks may be formed as illustrated in Fig. 2 by forming a series of interlocking loops from the thread in the successive stocking courses. That is to say, the ladder-like unconnected portions of the courses of the heel and foot which define the line of openings may be kettled up so as to produce a knitted wale. For such purpose any of a



variety of needles, such as the latch needle 12, may be employed. The needle is inserted at the end of the line of openings and a loop is formed in one course and drawn by the needle through the preceding course. In the figure interconnecting loops have been formed up through the course 13 and the needle is engaging the course 14 preparatory to forming a loop therein and drawing the same through the loop 15 in the course 13. This operation may be carried out very quickly by a skilled operator so as not to materially add to the time and labor required in the manufacture of the stocking. As above indicated the interlooping of the successive courses will be carried out until the line of openings is completely closed.

A further manner of practicing my invention is illustrated in Fig. 3 wherein, instead of forming interconnecting loops in the ladder crossings of the stocking courses at the openings, an independent thread is employed. By the use of a needle 12' the thread 16 is formed into a series of chain stitches which interlock the various courses of the stocking along the line of openings. As shown, the chain of stitches has been completed up through the course 13', the same locking such course with the preceding course without directly forming loops in the courses themselves as heretofore described in the form of my invention shown in Fig. 2. The needle 12' extends through the loop 17' formed in the thread 16 and has been inserted behind the course 14' to form and draw a further loop in the thread 16 through the loop 17'. The formation of the loops may be continued for the full length of the fashioning openings between the points a and c in the stocking of Fig. 1. It will be noted that the independent thread 16 of which the stitch formation is made is carried on the same side of the stocking fabric as that on which the needle forms the loops. It will be understood, of course, that the stitch formation may be applied from either side of the fabric. I may say, however, that I now deem it preferable to apply the same to the outside of the fabric and run it in the direction of knitting of the fabric so as to most closely simulate the appearance of the wales of the adjoining portions of the stocking.

In the specific application of the invention shown in Fig. 3 the chain of loops formed from the thread 16 are shown as interconnecting successive courses 13' and 14'. It may be found desirable, however, to preserve a certain amount of elasticity, to interconnect spaced courses instead of successive courses, in which case the needle instead of drawing a loop in the thread 16 around the course 14' will skip such course and draw a loop around the following or some succeeding course.

In the several embodiments of the invention described I have indicated the use of a single chain of loops for closing the line of openings. I have found that for general purposes such a single line of stitching is satisfactory. This is due to the fact that in kettling up the openings as illustrated in Fig. 1 the formation of the loops in either the manner of Fig. 2 or Fig. 3 causes a decrease in the width of the opening. It will thus be noted that the width of the line of openings between the points b and c which have been closed up is narrower than the unclosed portion between the points a and b. It will be obvious, however, that where circumstances require additional lines of stitching may be incorporated for the purpose of insuring complete closure of the openings.

When the line of opening has been closed up the last loop form will be anchored so as to prevent the chain from pulling out. This may be done in the embodiment of Fig. 3 by drawing the end of the thread 16 through the last formed loop and knotting the same. A separate tacking thread may be used for the same purpose in connection with the embodiment of Fig. 2.

It will be evident to those skilled in the art that by my invention I have overcome a serious objection to mechanical practices which result in the formation of openings in knitted fabric and have provided a way of eliminating the weaknesses and defective appearance resulting from widening. The invention as practiced is such as to completely obliterate and remove the preformed openings and to present a fabric surface where such openings existed which simulates and is indistinguishable from the adjoining knitted portions of fabric.

What I claim as my invention is:

1. A method of improving stockings which are knit as a single unit and which as knit present a line of openings between the foot portion and the heel pocket which consists in forming an additional interposed wale comprising a continuous chain of interlocking loops along the line of openings between the foot portion and the heel pocket and thereby filling in and closing said line of openings.

2. A method of improving stockings of the type in which the heel pocket and foot portion are integrally formed with continuous courses of loops and which have a border line of openings between the two portions, which consists in filling in the opening border line by running a continuous chain of interlocking loops constituting a new wale conforming in structure, appearance and direction to the wales of the heel pocket along the unconnected parts of the courses which define said border line.

3. The method of improving stockings of the type in which the heel pocket and foot portion are integrally formed with continuous courses of loops and which have a line of openings comprising unknitted loops dividing the two portions at their boundary, which consists in filling in the boundary by forming a continuous chain of loops of an independent thread into a wale conforming to the wales of the heel pocket and interlocking the successive loops of said wale with the unconnected parts of the courses which traverse and define said boundary.

4. A stocking having foot and heel portions knit as a unit with continuous courses of loops, the heel portion being widened and the wales therein being angularly related to the wales of the foot portion, and an additional interposed and continuous wale of interlocking loops extending parallel to the wales of the heel portion filling, and thus closing, the boundary line between the foot and heel portions and avoiding the presence of fashioning marks.

5. A knitted stocking having a foot portion and a heel pocket integral therewith formed by widening as a continuation of the knitted courses of the foot portion, the stocking at each side presenting a boundary between the foot portion and widened heel pocket, said boundaries being defined by interposed wales comprising continuous chains of interlocking loops and constituting lateral extensions of the fabric of the heel pocket, and thus obviating openings such as normally occur in widened fabrics.



6. A stocking having a heel pocket and a foot portion knit as a unit with continuous courses of loops, the heel fabric being widened so that the courses in the foot portion meet their continuations in the heel pocket at an angle and presenting a boundary line extending parallel to the wales of the heel pocket on each side of the stocking between the forwardmost wale of the heel pocket and the adjoining portion of the foot, said boundary lines being defined by interposed chains of interlocking thread loops simulating in structure, appearance and direction the wales of the heel pocket and interlocking the fabric courses along the boundaries.

7. A stocking having a heel pocket and a foot portion knit as a unit with continuous courses of loops, the heel fabric being widened so that the courses in the foot portion meet their continuations in the heel pocket at an angle and presenting a boundary line extending parallel to the wales of the heel pocket on each side of the stocking between the forwardmost wale of the heel

pocket and the adjoining portion of the foot, and wales of independent thread extending along said boundary lines, said wales comprising chains of interconnecting loops conforming to the wales of the heel fabric and which interlock with the unconnected parts of the fabric courses traversing and defining said boundaries.

8. The method of manufacturing full fashioned knitted hosiery of the single unit type, which comprises knitting the welt, leg, heel and foot portions thereof in a continuous knitting operation, and during the knitting of the heel portion shaping the same by causing the fabric thereof to be widened at predetermined points therein to produce an open line formation having a series of cross threads therein which separate the said shaped heel fabric from the foot portion, then causing said cross threads to be interlooped, with each other, to close the open line formation, and then securing said interlooped threads from unraveling.

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